

RETHINKING CONSTRUCTION MANAGEMENT EDUCATION PROGRAMME DEVELOPMENT

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Abstract

The construction management education is by far still evolving in meeting the 21st century education challenges in producing highly capable and competitive graduates. This circumstance is in part contributed by inadequate planning in designing programmes. The development of programmes till adapts the traditional approach in the design which seems short in providing and delivering a comprehensive program. One significant finding that contributes to this issue was related to an absence of a generally accepted term of reference. This study aims to test a working common recognize term of reference framework against the available construction management programme offered in the Malaysian public university. A qualitative approach has been chosen as the primary method which uses document analysis as the main technique to test the framework with the assistance of N-Vivo software. In this study, a working reference framework has been tested by mapping several undergraduate construction management programme syllabuses onto the framework. The findings found that the syllabuses are lacking in several technical areas and it is suggested that this framework can assist in the improvement of the programs by identifying the critical area that needs to be focus on.

Keywords: Construction, Education, Reference Framework.

1. Introduction

Construction industry is very dynamic and unique. Rapid changes in technological development [1], ever-changing regulatory requirement coupled

with the challenges of global competitiveness [2] have created the need for highly knowledgeable and capable construction management (CM) graduates. Studies carried out in other countries on the identification of necessary and skills attribute for CM graduates identified mixed finding which the industry employers' representatives suggest that the needs of the industry do not always address by the education and training offered at universities [3-5].

CM has been recognized as a professional discipline. Many universities in countries such as Australia, Hong Kong, China, UK, USA and Singapore offered undergraduate and postgraduate degree in CM courses [2] and it has steadily been recognized by the industry clients and other built environment professionals [6]. There are many types of research being done especially in the UK regarding the CM education and some of which are quite similar to the Malaysian scenario. The situations of CM education in Malaysia are as discussed.

Recent prediction of skills shortage within the construction sector is very alarming and the higher education sector has a significant role to play in responding to this issue and there is evidence showing that the retention of graduates in the industry and application to build environment degree are falling [4]. This has created a void which is being filled by foreign workers and other graduates from different field who are struggling to find a job.

Project failure is due primarily to getting the wrong people who are ill-trained for the job, with the incorrect attitude, irresponsible and questionable integrity [7]. This has been supported by the findings in the 11th Malaysian Plan work shop which identified that the graduates appointed as an officer within the project are lacking in the required competency for the given task [8]. Apart from relevant course content to job-related situations, several authors have highlighted that there is the need for an appropriate teaching approach that bridges the perceived mismatch between formal academic instruction and on the job training [9].

CM education in Malaysia started only in the last 30 years. In Malaysia, only 3 public universities offer a bachelor degree in construction management. They are Universiti Teknologi Malaysia (UTM), Universiti Teknologi MARA (UiTM) and Universiti Sains Malaysia (USM). For the graduates' job prospect, they have the opportunity to work in construction management line.

The Malaysian Qualification Agency (MQA), in responding to the globalization agenda of education introduced the Malaysian Qualification Framework (MQF) as a means to standardize the outcomes of the education system in Malaysia. MQA is responsible for the implementation of the principles of the MQF and has established structures to oversee the development of the relevant qualification and to ensure that the institutions that deliver the qualification meet the standards especially in developing their curricula.

2. Construction Education Development

Previously, architects and engineers have seen themselves as professional master builders who planned and designed project and then supervised the actual construction, which was done by forces working under their direct supervision or by a contractor engaged primarily to provide and supervise the labor force [10]. The work and its supervision were left to constructor who was commonly

craftsmen. For many years, construction managers were either craft persons without a college education or graduates of an engineering program who were trained on the job [11].

Moreover, contractor view engineers and architects as an elitist who felt themselves to be genteel to work with their hands or push others to do so, or to be concerned with money, business and sometimes, political matters, which were the contractor's principal concerns [10]. However, the management and technology of construction companies change and expand dramatically. This complexity of construction project, innovation and evolution in construction technology, the sophistication of new equipment all increased the demand for well-educated and well-trained construction managers with knowledge of business and building management [12].

Despite the long-standing demand for continues professional development in this area, little attention is devoted to CM in academic courses [13]. A recognition of the needs to include a focus on the management of the project in the education of both undergraduate and graduate students began to develop in civil engineering programs at a number of universities in the United States in the late 1950s and early 1960s [14].

The aim of CM education must give bright, alert and hard-working individuals running starts toward a successful professional career operating in some phase of this highly complex industry [10]. The current thrust of CM program is to produce construction oriented graduates who can immediately cost-effective upon employment by the contractor [15].

2.1. Construction management curricula

The construction industry is known to be complex and fragmented, involving numerous players, skills and technologies. Construction managers are engaged not only in the task that requires pure technical expertise such as production and maintenance of constructed facilities but also in specialized tasks that require extensive management and administrative expertise [16]. CM education is built upon the fundamentals of civil engineering and most programs offers students a balance or research and coursework in construction technologies and management philosophy and practice, with an additional study from other disciplines to provide candidates with the skills and experiences needed to successfully manage a construction project [17].

The apparent consensus on the needs for the management education for professional justifies the pursuit of a program that encompasses the knowledge required for the construction sectors [13]. Some believe that managerial education can be acquired at the workplace or should be introduced and integrated as part of undergraduate programs [16]. From the curricula of existing programs in the Malaysian public university, it is possible to synthesize a set of courses believed to meet the needs and the basic requirement of the industry. The CM curriculum is also a combination of engineering, technology, construction techniques and management [1].

The development of the curriculum is still using the traditional approach. An established programme structure from established university is always being

referred and used as the basic structure of the programme. To supplement, the use of the available international standard has provided guidance on what is the key knowledge area that needed to be focused. However, there is no clear guideline on how this key knowledge area is supposed to be mapped onto the curriculum structure and it is observed that because of the lacking in a commonly accepted reference framework, the structure of the programme considered for this study has been identified to be almost the same from other programme structure found within other universities in the world.

2.2. Reference framework

The availability of a commonly recognized term of reference is crucial to be used as a reference framework in order for any programme to be developed holistically. The development of reference framework (RF) is always linked with an improvement of processes [18-20]. Reference is defined as a source of information containing useful facts and information while the framework is defined as a set of ideas or facts that provide support for something or can be said as the frame of reference [21]. The depth and detail of RF may vary depending on the objective of the RF. It can be quite detailed or just a simple outlined [22].

The framework in Fig. 1 has been developed to supplement the needs of the CM education and training in improving the current practice. The RF is basically a rundown of typical activities found within the construction project management lifecycle. This RF is developed to give an overview of how the overall project lifecycle processes look like. It is imperative for the education and training programmes developer to understand the processes and know what are the critical activities before any programmes can be developed.

This RF was initially developed as a means to assess the Malaysian public project management training adequacy. This framework has been developed and validated, drawing data from experienced practicing professional through focus group discussion. The framework has assisted the public project management practice by clearly identified the activities that the public project officer should be responsible for the project lifecycle and thus has refined and detailed the training needs of the public officer in managing projects. This framework has been adopted to assess the CM programme provided by the public university for this study.

3. Research Method

This study uses the qualitative approach which employs the document analysis technique as the main method in obtaining the result. The main source of the document was obtained from the CM undergraduate programme syllabus offered by the Malaysian public university. A number of three public universities which offered the CM program were identified. They are Universiti Teknologi MARA (UiTM), Universiti Teknologi Malaysia (UTM) and Universiti Sains Malaysia (USM). The syllabus has been processed and compared to the framework with the assistance of the N-Vivo software. This software helps in theming and coding the data to ease the analysis. The findings have been mapped onto the framework to give an overview on how the current syllabus coverage against the reference framework.

4. Findings and Discussions

The result for the syllabus mapping is as shown in Fig. 2. From the document analysis, the coverage of the Malaysian public university CM has been mapped onto the framework. The mapping provides an overview on how the CM programme coverage compared to what is practiced in the industry.

From the results in Fig. 2, it can be seen that the coverage of the knowledge provided for each stage of the construction project lifecycle is not comprehensive. However, to be fair, not every activity is needed to be mastered by the CM graduates. For an instance, in the design stage, where the overall design is being produced is under the responsibility of the architects which has the skills and knowledge in that particular task. Same goes with the tendering stage which the quantity surveyor is the person who is qualified to produce and assessed the tender. But then again, it is quite concerning that the other stages where the CM syllabus should be focusing is still lacking in the content.

The result indicates that the CM programme being assessed are still lacking in some technical area. In fact, it can be observed that the Malaysian public university CM syllabus offered is not holistic in providing a comprehensive construction management technical knowledge.

For the sake of argument, PMBoK[®] may be sufficient to be used as the term of reference to a certain extent. However, bear in mind, BoK is relatively a guideline of the knowledge area found within the project management. It gives guideline in 'what' knowledge area is consists in project management rather than to guide on 'how' we should implement it [24]. It is the programme developer responsibility to integrate the knowledge area with the actual process to provide a comprehensive and holistic programme to produce better graduates.

5. Conclusions

From this empirical study, it can be observed that a new approach is needed to be considered for future development in CM programmes. However, for existing program, the structure can be improved to integrate on what is lacking and there is no need to reinvent the wheel. Further study on how the practice can move forward need to be carried out in order for the education and training in CM to be relevant and up to date.

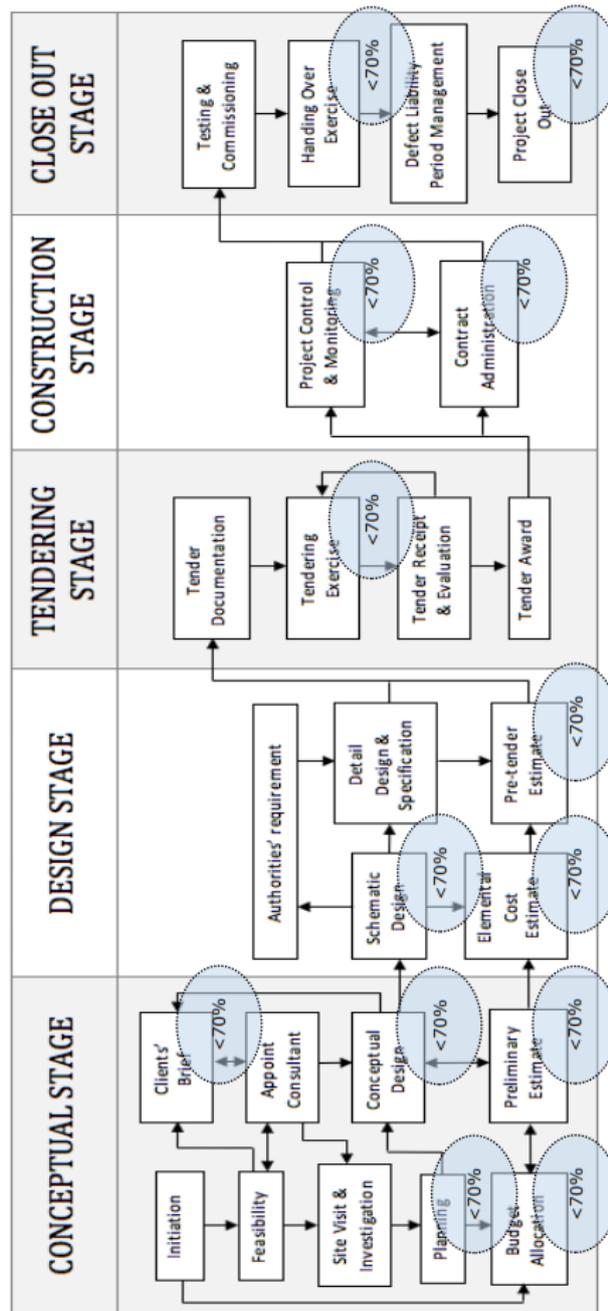


Fig. 2. Malaysian public construction management programme coverage.

References

1. Massyn, M.; Mosime, L.; and Smallwood, J. (2009). Construction management graduates-do they have the competencies that industry need? *RICS COBRA research Conference*. The University of Cape Town, 256-266.
2. Love, P.; and Haynes, N.S. (2001). Construction managers' expectation and observations of graduates. *Journal of Managerial Psychology*, 16(8), 579-593.
3. Abudayyeh, O.; Russell, J.; Johnston, D.; and Rowings, J. (2000). Construction engineering and management undergraduate education. *Journal of Construction Engineering and Management*, 126(3), 169-175.
4. Carter, K. (2006). Construction skills-the role of the educational supply chain. *Built Environment Education Annual Conference (BEECON 2006)*, London, UK.
5. Huda, F.; and Saqib (2008). Finding ways for enhancing postgraduate level in construction management in Pakistan. *First International Conference on Construction in Developing Countries (ICCIDC-I)*. Karachi Pakistan, 33-41.
6. Love, P.; Haynes, N.; Sohal, A.; Chan, A.; and Tam, C. (2002). *Key construction management skills for future success*. Retrieved November 8, 2010, from monash university, department of management: <http://www.buseco.monash.edu.au/mgt/research/working-papers/2002/wp49-02.pdf>
7. Tan, A.A. (2004). *Why Project Fail? 1001 Reasons*. Selangor: Venton Publishing (M) Sdn.Bhd.
8. ICU (2012). *Lab Pendekatan Baharu Pelaksanaan Projek Pembangunan Rancangan Malaysia Lima Tahun (RMLT)*. Putrajaya: Implementation Coordination Unit, Prime Minister Department.
9. Nicholas, C.; and Theo, C.H. (2007). Industry and academia perceptions on construction management education : the case of South Africa. *Journal for Education in the Built Environment*, 2(2),85-114.
10. Clarkson, H.O. (1990). Dilemmas facing construction education and research in 1990s. *Journal in Construction Engineering Management*, 116(1), 4-17.
11. Levitt, R. (2007). CEM research for the next 50 years: Maximizing economic, environmental and societal value of the built environment. *Journal of Construction Engineering Management*, 113(9), 619-628.
12. Alan, A.; and Rueben, M. (2006). Improving enrollment in the master of construction management program at Bowling Green State University. *Journal of Professional Issues in Engineering Education Practice*, 132(4), 312-321.
13. Victor, Y.; Eugenio, P.; and Alenjandro, J. (2012). Designing a benchmark indicator for managerial competences in construction at the graduates level. *Journal of Professional Issues in Engineering Education*, 138(1), 48-54.
14. David, A.; and Gul, P. (2010). Graduate education in construction management. *Journal of Professional Issues in Engineering Education Practice*, 136(3), 175-179.
15. Haltenhoff. C.E. (1986). Educating profesional construction managers. *Journal in Construction Engineering Management*, 112(2), 153-162.

16. Arditi, D. (1984). Graduate education in construction management. *Construction Management and Economics*, 2(3), 193-199.
17. Russel, J.; Hanna, A.; Bank, L.; and Shapira, A. (2007). Education in construction engineering and management built on tradition: Blue print for tomorrow. *Journal in Construction Engineering Management*, 133(9), 661-668.
18. Conradi, R.; Fernstrom, C.; Fugetta, A.; and Snowdon, R. (1992). Towards a reference framework for process concepts. in J.-C. Darniame, *Software Process Technology* (1-17). Springer Berlin Heidelberg
19. Bufardi, A.; and Kiritsis, D. (2013). On the development of a reference framework for ict for manufacturing skills. In I. I. Processing, *Advances in Production Management Systems, Sustainable Production and Service Supply Chains*(pp. 443-451). Springer Berlin Heidelberg.
20. Franceschini, F.; Galetto, M.; Maisano, D.; and Mastrogiacomo, L. (2007). Properties of performance indicators in operations management: a reference framework. *International Journal of Productivity and Performance Management* , 57(2), 137-155.
21. Merriam-Webster. (2014). *Merriam-Webster's Collegiate Dictionary, 11th Ed.* Springfield, Massachusetts: Merriam-Webster, Incorporated.
22. UNICEF. (2002). *Evaluation Technical Notes*. UNICEF.
23. Mustaffa Kamal, M.F. (2016). *Project management reference framework (RF) for the Malaysian public projects*. Shah Alam: UiTM, Unpublished PhD Theses.
24. Gough, J.; and Hamrell, M. (2010). Standard operating procedures (SOPs): How to write them to be effective tools. *Drug Information Journal*, 44(4), 463-468.