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JUDUL: EDUCATING EARLY AWARENESS OF NEW CONSTRUCTION PHILOSOPHY

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**EDUCATING EARLY AWARENESS OF NEW CONSTRUCTION
PHILOSOPHY**

ZA'IM BIN BASIRAN

A project report submitted in partial fulfilment of the requirements for the award of
the degree of Master of Science (Construction Management)

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NOVEMBER, 2007

I declared that this report entitled “*Educating Early Awareness of New Construction Philosophy*” is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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Dedicated to my beloved mother and wife

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ABSTRACT

Fragmented way of working has been the root cause of devastating problems associated with the practice of traditional project delivery method, yet, it has not been fully realized and understood by the construction community and as it has been the practice for a long time. On the other side, the emergence of new construction philosophy in construction proven successful upon its implementation in overcoming the problems has not been responded well, by project developers, researchers and educators. The exposure to and the understanding of the principles of the new construction philosophy is what is needed to create early awareness before the adoption. While the tertiary students have been exposed to the philosophy, their secondary counterparts are yet to know what it is and what significance it can bring. The civil engineering students in technical schools may not face great difficulties in understanding the philosophy as they have the elementary knowledge in construction as early as in form four. This study, therefore, focuses on civil engineering teachers and civil engineering students in technical secondary schools in the State of Johor to obtain their views, opinion and acceptance towards the existing construction practice as well as the new production philosophy in construction. The results of the finding shows that the teachers have delivered and imparted necessary knowledge on construction practices and construction materials as required by the syllabus of form four civil engineering studies subject to their students. They are also aware of the current problems in the industry and showed strong acceptance of the important elements of new construction philosophy. Similar results were obtained from the analysis of the students' responses suggesting that they have the required level of knowledge in current construction practices that has helped them understand and accept the new construction philosophy introduced. The study can be used to provide information on educating early awareness of new construction philosophy and the potential of civil engineering studies curricula in technical schools as a platform for paradigm shift. In the long run, educating early awareness of the philosophy can contribute to sustainable solutions to the current problems in construction industry. In addition, it may give a concrete basis for the curriculum designers to incorporate the philosophy into the syllabus.

ABSTRAK

Pengasingan kerja-kerja dalam pembangunan sesuatu projek pembinaan telah menjadi punca utama kepada masalah-masalah berkaitan dengan amalan kaedah tradisional dalam pembinaan. Punca kepada masalah-masalah seperti kualiti produk yang rendah dan pembaziran itu belum difahami sepenuhnya oleh komuniti pembinaan kerana kaedah tradisional dalam pembinaan telah diamalkan sejak sekian lama. Meskipun falsafah baru dalam pembinaan telah terbukti berjaya dalam mengatasi masalah tersebut, respon dari pemaju projek, pengkaji dan pendidik masih belum menggalakkan. Pendedahan dan kefahaman kepada prinsip falsafah baru dalam pembinaan adalah perkara yang diperlukan sebelum implimentasinya. Mahasiswa di pusat pengajian tinggi telah diberi pendedahan kepada falsafah ini manakala pelajar peringkat menengah masih belum mengetahui kewujudan dan kelebihannya. Pelajar kejuruteraan awam di sekolah-sekolah menengah teknik mempelajari prinsip asas pembinaan di awal tingkatan empat Oleh itu, pendedahan falsafah baru dalam pembinaan kepada mereka adalah relevan. Kajian ini memberi fokus kepada guru-guru yang mengajar pengajian kejuruteraan awam dan pelajar pengajian kejuruteraan awam di sekolah-sekolah menengah teknik di Negeri Johor untuk mendapatkan pandangan, pendapat, persepsi, kesedaran dan penerimaan mereka terhadap kaedah tradisional dan praktis falsafah baru dalam pembinaan. Keputusan kajian menunjukkan bahawa guru-guru telah menyampaikan pengajaran amalan pembinaan dan bahan pembinaan kepada pelajar mereka sebagaimana dikehendaki oleh sukatan matapelajaran pengajian kejuruteraan awam tingkatan empat. Mereka menyedari akan masalah yang dialami oleh industri pembinaan dan dapat menerima dengan baik akan elemen-elemen penting yang terkandung dalam falsafah baru dalam pembinaan. Analisis dari respon pelajar menunjukkan bahawa mereka telah mengetahui dan memahami amalan pembinaan yang telah disampaikan oleh guru mereka. Pengetahuan ini telah menolong mereka memahami dan menerima dengan baik falsafah baru dalam pembinaan yang diperkenalkan. Kajian ini menyediakan maklumat pendidikan kesedaran awal tentang falsafah baru dalam pembinaan dan potensi kurikulum pengajian kejuruteraan awam di sekolah teknik sebagai platform untuk anjakan paradigma. Dalam jangka panjang, pendidikan kesedaran ini boleh menyumbang kepada penyelesaian yang mapan kepada masalah industri pembinaan sekarang. Selain itu, ia boleh menjadi asas yang konkrit kepada penggubal kurikulum untuk memasukkan falsafah baru ini dalam sukatan pelajaran.

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CHAPTER 1

INTRODUCTION

Construction, as an industry, involves many areas of specialization such as economics, management, architecture, engineering design, construction technology and some other fields of civil engineering. The project development from inception to handover involves consultants in feasibility studies, architects and engineers in project design and contractors in the realization of the project. In current practice, the parties undertaking the project development work individually and separately. The client of a project has to move from one party to another to get the project completed.

The fragmented and sequential way of working has caused endless problems like less consideration of downstream requirement such as project constructability during design development, long project development time, lack of sharing of project information, poor communication, lack of transparency and adversarial relationship.

A number of solution or visions have been offered to minimize those problems including new technology, materials, and machineries but more importantly is the new approach of working called new construction philosophy like total quality control, partnership, collaboration, concurrent engineering, collation, cross functional team, lean production and continuous improvement all of which come from manufacturing. The construction industry has initially rejected those ideas from manufacturing because of the belief that construction is in a class of its own, different from manufacturing. The philosophy is not fully acknowledged in research programs and educational curricula.

CHAPTER 2

CIVIL ENGINEERING EDUCATION AND FIELDS

This chapter covers the evolution of civil engineering around the globe and the Malaysian experience regarding the development of civil engineering education and its current accreditation in the country. Focuses are given on the civil engineering fields to signify the advances in civil engineering education and to portray that the education keeps on evolving and developing to serve increasing human needs and encounter the associated problems. There was an urgent need for the civil engineering education to be implemented in the secondary level. Its syllabus was designed to educate several fields of civil engineering to the students undertaking civil engineering discipline in technical secondary schools.

CHAPTER 3

TRADITIONAL CONCEPT AND NEW CONSTRUCTION PHILOSOPHY

The discussion in the early part of chapter focuses on the root causes of the problems in current construction industry, current practices in construction and the difference between traditional concept adopted in construction and the concept demonstrated in new construction philosophy. It is intended to establish direct connection between the problems and shortcomings of the traditional concept and bring the new philosophy into limelight in solving those problems with its management approach, tools and methods. The next part discusses slow responses to the philosophy that has been seen as the constraint to its implementation progress. It demands the education in tertiary and secondary levels to play its natural role in changing old paradigm. The last part highlights the need to have prior knowledge in construction to facilitate the understanding of new construction philosophy. This is to develop a possibly viable basis for the introduction of the philosophy to the civil engineering students in technical secondary schools.

CHAPTER 4

DATA COLLECTION AND ANALYSIS TECHNIQUES

The objectives of this project report are realized by means of two methods. The first method is the literature review undertaken to gather information about the topic of the study, current concept and practices in construction and the conceptualisation of the new construction philosophy. The second method is a structured questionnaire survey to obtain feedbacks from the respondents followed by data processing and analysis techniques used to generate the findings.

CHAPTER 5

RESULTS AND DISCUSSION

This chapter deals with the analysis of the data collected from the survey and the interpretation of the findings on the respondents' responses to the current construction practice and its associated problems and to new construction philosophy in the view to achieve the objectives stated in Chapter 1. Comparison of responses from both groups of respondents is presented at the end to analyse the influence of the teachers' knowledge and their teaching on their students' understanding on the current practice and to see the variation of their acceptance to new construction philosophy.

CHAPTER 6

CONCLUSION AND RECOMMENDATION

The final chapter of this project report highlights all findings that leads to the achievement of the objectives of the study stated in Chapter 1. It includes the literature work and the findings from empirical work, particularly on the survey data collected. A conclusion regarding the aim of the study is then drawn and recommendation is offered.