

Future Directions of Construction Education to Meet the Challenges and Opportunities in an Unstable Global Economic Environment

**S. Thomas NG, Kelwin K. W. WONG and James M. W. WONG,
Hong Kong SAR, China**

Key words: Construction education, competitive edge, tertiary education institutions

SUMMARY

The financial tsunami has certainly posted lots of challenges to the construction industry as the outlook of a country's economy could become more unpredictable. In order to survive in a volatile market, construction stakeholders must improve their competitive edge over their competitors. This is particularly the case if one would like to explore the opportunities in a more lucrative market like Mainland China, India, or Middle East. Unfortunately, construction has always been regarded as a traditional industry, leaving very little room for innovation or improvement. This mindset should be rectified especially through our next generation who is more ready to accept new ideas and concepts. The purpose of this paper is to examine the future direction of construction education so as to nurture the next generation of construction expertise. The findings are based on a recent study conducted in Hong Kong with students in the tertiary education institutions who are studying construction related programs. The paper begins by examining the condition of construction market around the world. The potential factors which can improve the competitive edge of students are identified. The results of the questionnaire survey are then presented. It is found that the soft skills of students doing construction related programs are lacking. Besides, it is beneficial for students to be exposed to the practices, legal framework and cultures of some emerging economies like Mainland China and Middle East during their study. In view of that, different strategies are put forwarded in the paper to improve construction education at tertiary level.

Future Directions of Construction Education to Meet the Challenges and Opportunities in an Unstable Global Economic Environment

**S. Thomas NG, Kelwin K. W. WONG and James M. W. WONG,
Hong Kong SAR, China**

1. INTRODUCTION AND BACKGROUND

The global financial meltdown in 2008 has put an enormous amount of stress on many industries with the construction industry being no exception. The plunge in prices of raw materials and crude oil has reflected a diminishing demand and a slow down of industrial activities across the world. The credit crisis has led to the inability of investors and developers to secure the financing required for development projects. According to data from the International Monetary Fund (IMF), economies in richer developed nations are estimated to see a miniscule growth of only 0.1 percent this year, whereas economic growth in developing nations is expected to reach around 5%. In response to the current economic situation, the IMF readjusted its growth projections in November 2008, with China's economy estimated to grow 9.7% for 2008 and 8.5% in 2009, while the estimations for India are 7.8% and 6.3%, respectively. This is in stark contrast to some western countries, where negative growth is anticipated (CNN, 2008).

The construction industry is vital to an economy and often used as a catalyst to revive or jumpstart a struggling economy as demonstrated by the Chinese government's introduction of a RMB 4 trillion (USD \$580 billion) stimulus plan primarily focused on construction and infrastructure development, RMB 100 billion of which is expected to be spent before the end of this year. The package will focus on 10 major areas, amongst them include low-income housing, rural infrastructure, water, electricity, transportation and environmental improvement projects (Gallagher, 2009). With this announcement, it can be seen that the central government has the ability to react swiftly and boldly in a crisis situation. As part of the package, China plans to direct RMB 400 billion in the next three months to fund housing projects, rural infrastructure development and reconstruction efforts after the major earthquake that hit the province of Sichuan earlier in May this year. RMB 20 billion is to be brought forward from next year's reconstruction budget (Boyd, 2008b).

In the Middle East, Dubai was once considered as a construction and development hotspot only a short while ago but has now shown signs slowing down. Three development schemes from the state-owned firm, Dubai Properties are behind schedule, namely the Culture Village, the Porsche Design Towers, and the Executive Towers (Boyd, 2008a). Further indications of a slowdown are that Damac Properties, also based in Dubai, have recently announced that it plans to cut 200 positions, while another developer Omniyat Properties also reported up to 60 redundancies (Stewart, 2008b). One of the main problems for the United Arab Emirates is that it is a very international country and many of the development projects are funded by foreign speculative money (Stewart, 2008c) so when banks around the world tighten restrictions on lending, liquidity flow becomes a major obstacle that hampered project development (Stewart, 2008a). By contrast in neighboring Qatar, developer Barwa recently announced plans for a

new city development in Al Kohr (50km north of Doha), as part of the Qatari 2025 plan outlined by the Qatari Urban Planning and Development Authority (Willoughby, 2008). The drastic contrast between these neighboring countries shows just how volatile the markets can be and how rapidly conditions can change. This serves as more reason for the need of construction industry professionals to acquire additional skills and training that will help them adapt to these changing markets and better prepare them to work in different locations.

At times like these, even in markets that were previously conceived to be highly robust with seemingly endless development projects like the Middle East and Macau are now showing signs of deceleration. This has led consulting and contracting firms scrambling to compete for the remaining projects still available and left these firms with redundancies in human resources. The silver lining is that, unlike skilled laborers or construction workers, construction industry professionals are more mobile and flexible, thus have the ability to capture overseas markets, provided that they have the necessary skills and competitive edge over their rivals.

Acquiring these needed skills and maintaining an edge are crucial in the future development of the construction industry anywhere. Inability to provide the essential tools and training to upcoming talent to adapt to emerging markets can have dire consequences; one of which being the loss of talent to other industries that will eventually lead to a shortage of construction professionals when volume picks up again. This paper aims to highlight the rapidly changing construction market conditions in some of the key developing regions in the world, and based on a surveys and interviews conducted with undergraduate students and program leaders from construction-related disciplines at universities in Hong Kong, examine the willingness of students to work in foreign locations, what factors affect their decisions, the barriers they may face with working in a foreign environment, the competitive edge they need, whether or not the current tertiary education system in Hong Kong can adequately address the changing conditions in the construction industry, and ultimately discuss the necessary changes needed in the education system to better prepare students for a more globalized working environment.

In the subsequent parts of this paper, details about the student surveys and interviews with program leaders of tertiary education institutions will be explained in the methodology section, while the results and analysis will be discussed in the findings section. Finally discussions and concluding remarks will be made in the end to suggest the direction in which construction education should be headed and what measures are necessary to properly prepare a new generation of professionals for the world's evolving markets.

2. METHODOLOGY

In a quest to identify the future direction of construction education to meet the challenges and opportunities ahead, a study involving student surveys and interviews with tertiary education program leaders in construction-related disciplines was conducted in Hong Kong. Over 380 surveys from 5 different universities in Hong Kong (i.e. The University of Hong Kong, Chinese University of Hong Kong, Hong Kong University of Science and Technology, Hong

Kong Polytechnic University, and City University of Hong Kong) were collected from undergraduate students studying construction-related programs, which includes architecture, engineering (*viz.* civil, structural, environmental, geotechnical, electrical & mechanical and building services), surveying, and town planning. Students were asked about their:

- 1) interest and willingness to work other cities outside of Hong Kong (Mainland China, South East Asia and Middle East);
- 2) factors that would affect their decisions to work in Mainland China and overseas;
- 3) barriers they may face when working in a foreign city;
- 4) perception of competitive areas of Hong Kong construction professionals; and
- 5) overall development and training they received from their undergraduate studies.

Interviews were conducted with 10 construction-related program leaders from the 5 Hong Kong universities mentioned earlier. The interviewees were asked to comment on:

- 1) whether or not equipping students with skills to work in Mainland China and overseas markets is part of their major educational objective;
- 2) if there are courses specifically for helping undergraduate students improve their exposure on Mainland Chinese and overseas practices, legislation and regulations;
- 3) availability of study tours, site visits or exchange programs to Mainland China and overseas locations to students;
- 4) opportunities and networks to assist students in acquiring work experience in Mainland China or overseas locations prior to graduation;
- 5) specific courses available to help improve language proficiency of undergraduate students who wish to work in Mainland China or overseas locations; and
- 6) consideration of offering special programs that emphasize on emerging markets.

3. FINDINGS

3.1 Hong Kong Undergraduate Student Surveys

To gain a better understanding in the students' mindset and willingness to work in foreign locations, students were asked if they would be interested in working in places such as China, India, the Middle East and Thailand. Over 70% of them expressed interest in working in 1st tier cities in China such as Beijing and Shanghai. Nearly 60% of them responded positively to working in the Middle East. However, interests in the other regions were much lower, around or below 30%. International status of major Chinese cities and their high profile construction projects has made these cities more well-known to these students and provide something they can relate to. The Middle East is famous for its large-scale, lavish development projects that are both inspiring and alluring. Furthermore, working in a glamorous major metropolis is much more appealing to youngsters than working in developing regions where the quality of life and living conditions may be less attractive. Exposure, promotion and education on the potential of developing regions to students would certainly help make these places more appealing to young professionals.

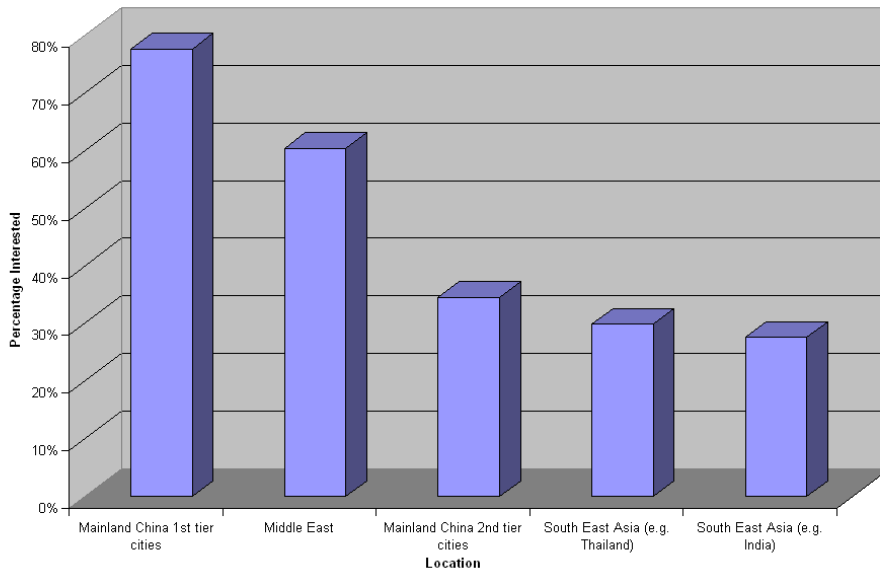


Figure 1: Preferred Location of Work

As expected, salary is the biggest factor that a student considers when choosing to work in Mainland China or overseas. Working conditions, future opportunities for promotion and safety also ranked highly, with over 90% of the respondents considered those as important factors. By contrast, family and familiarity of location ranked at the lower end with around 70% and 65% of respondents feeling those are factors that they would consider.

Market sustainability and understanding of local laws and regulations are the top two barriers Hong Kong students in construction-related disciplines felt would be major challenges, with over 70% of students indicating that they feel those are barriers they believe they will face when working in a foreign location. Language/communications and cultural differences also ranked highly at over 60%. These are genuine concerns that have to be addressed in the education system so that students can feel more confident and comfortable working away from home.

Competitive advantages are crucial when contending in the global market place. Aside from the fundamental technical skills that form the foundation of a competent construction industry professional, he or she must have additional skills that separate them from their international counterparts and provide an edge. Project management skills ranked as the top competitive advantage with over 90% of the students in construction-related disciplines feel that this is a strength Hong Kong construction professionals possess, followed by expertise in high-rise buildings at over 85%. Other notable strengths include producing high quality deliverables, experience working in a multi-national environment, work ethic and flexibility. In previously conducted studies, meetings with industry practitioners and representatives from trade associations and professional institutes also considered these to be strengths of professionals from Hong Kong.

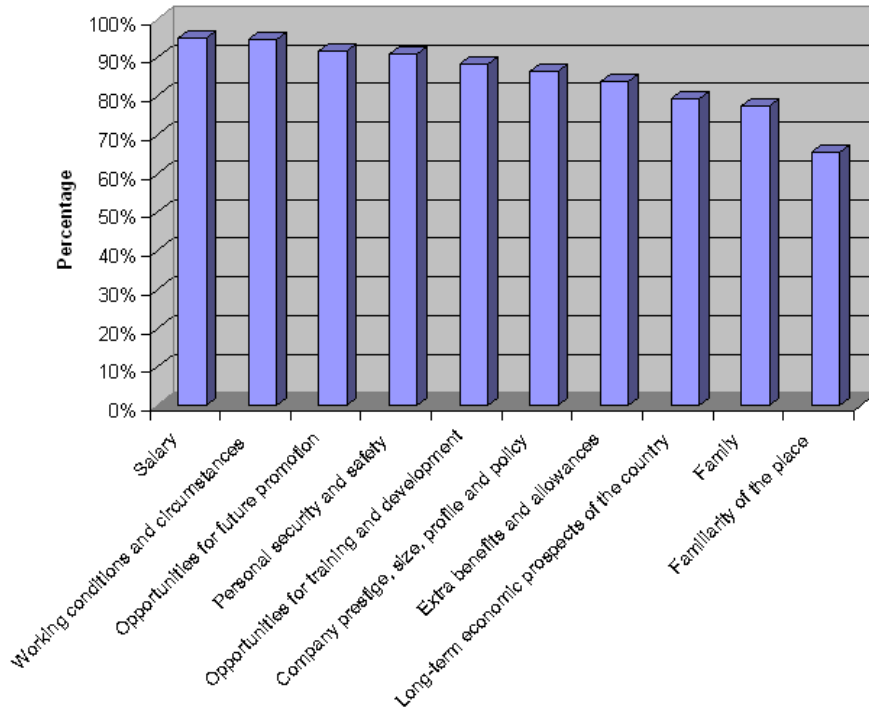


Figure 2: Factors Affecting Decision to Work Outside of Hong Kong

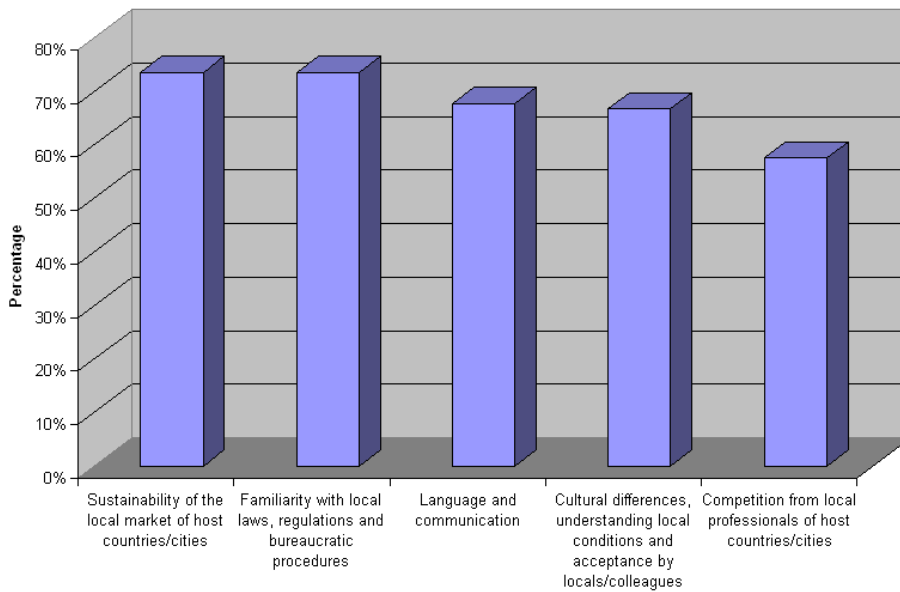


Figure 3: Barriers to Working Overseas

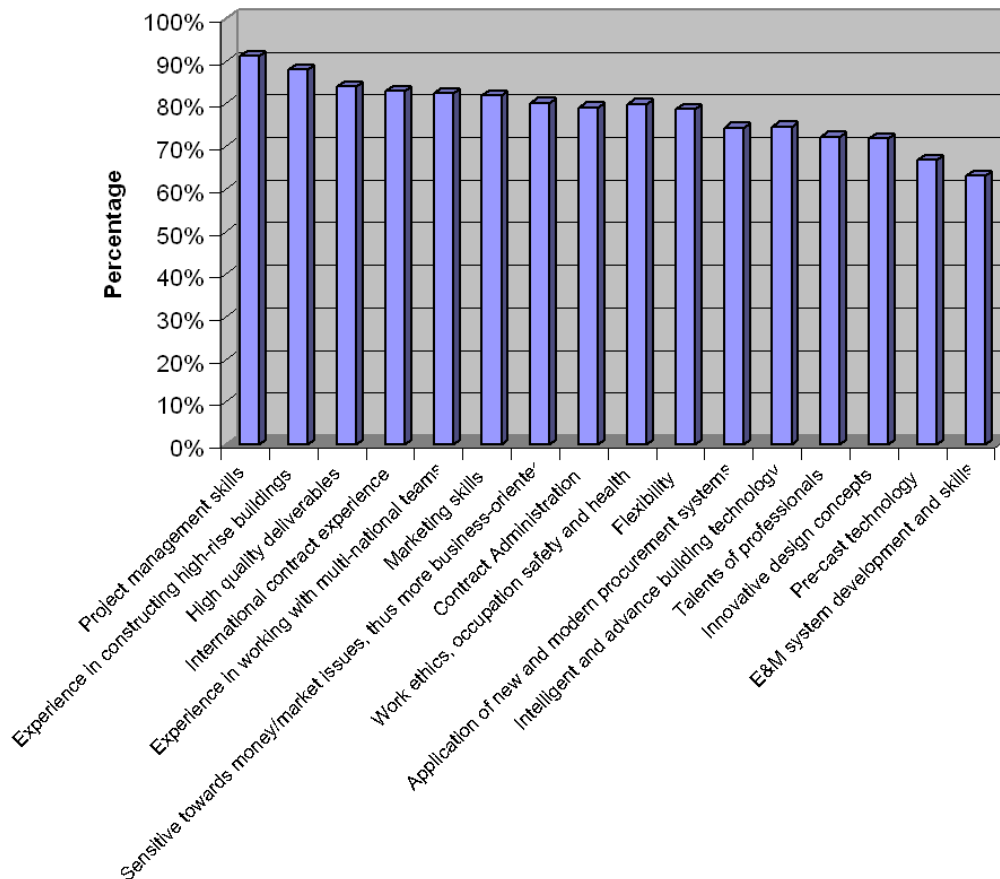


Figure 4: Competitive Advantages

When students were asked about their overall development training received from their program, the majority of them (close to 80%) felt that they gained experience and knowledge of local industrial practices, as well as critical and creative thinking. However, cultural appreciation and adequate training to work overseas ranked at the bottom with 53% and 51%, respectively. This clearly shows that many students do not feel confident in their ability to work in foreign locations and feel they lack the cultural understanding needed to work overseas.

3.2 Interviews with Construction-related Program Leaders

Based on the interviews conducted with construction-related program leaders, only about half confirmed that equipping students with the skills and tools to work in Mainland China and overseas is a “major” educational objective in their respective programs. With regards to particular courses or training directed towards this objective, many universities do offer industrial-related projects, site visits, internships and exchange programs. However, in many cases these are not compulsory courses for the completion of the programs but rather offered as elective courses.

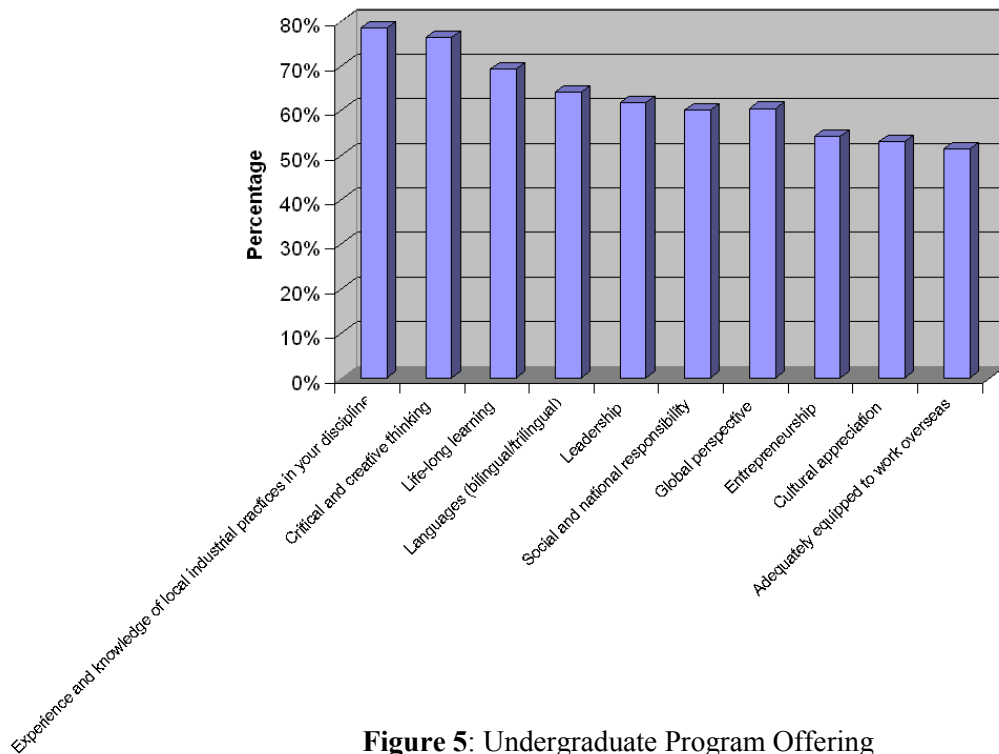


Figure 5: Undergraduate Program Offering

Language training (English and Chinese) and knowledge on construction laws and regulations are also lacking in many programs, with the exception of a few departments. Some universities and departments do offer a courses in Hong Kong, PRC and International Construction Law in the department of civil engineering, and Chinese language courses in the department of real estate and construction, both of which are mandatory in certain programs and disciplines. However, not all universities and departments offer these courses or regulate them as compulsory. Courses geared specifically towards emerging markets like Mainland China and elsewhere overseas are also rare.

From this investigation, many unfilled gaps are evident in construction-related education programs. Even when training schemes such as exchange programs, language courses and specific courses related to developing regions are offered, they are usually elective courses that not all of the students will have exposure to. With a 3-4 year undergraduate program already being intense and demanding, it would be a great challenge for universities to convince students to take on more workload and develop these additional skills. It will be up to educators and industry practitioners to help promote these courses to students and help students comprehend the importance of attaining these skills in today's construction markets.

4. DISCUSSIONS AND CONCLUDING REMARKS

In an increasingly globalized economy, the role of emerging markets such as China, India, Brazil and Russia will become more significant as they currently hold the largest cash reserves in the world. At the G20 summit held in early November of 2008, the leaders from

this group expressed their dedication to work together to overcome the current economic crisis and re-emphasized their dedication to do whatever necessary to stabilize the economy. Furthermore, there was general consensus amongst the members of Asia-Pacific Economic Cooperation (where member countries account for 60% of economic growth in the world) that there is a need to overcome the trade barriers that lead to the Great Depression in the 1930's (CNN, 2008). These developing regions have the necessary capital to inject into their economies and domestic demands are on the rise.

In the face of this changing economic environment, existing and upcoming professionals in the construction industry must be adequately trained to adapt to different markets and cater to regional demands in a more internationalized market. The skills needed to be successful in the international market such as project management skills, construction laws and regulations, language training (English and Mandarin in particular), and cultural knowledge will become increasingly vital for construction industry professionals who wish to compete in the global arena. As demonstrated in the undergraduate student surveys conducted in Hong Kong, today's students in construction-related disciplines are well aware of the changing market conditions ahead and realize that they need to reach out to developing regions to expand and build their careers as the local Hong Kong market is making a gradual transition from capital works to repair and maintenance works. Based on the interviews with program leaders in construction-related courses in Hong Kong, universities do understand the need for courses in language development as well as working environments, laws and regulations in emerging markets. Nevertheless, additional efforts are needed for further adjustments to their curricula in response to this need. Continual strides in education development to prepare students in construction-related disciplines for working in foreign, emerging markets can help add a degree of flexibility to their arsenal, enabling them to have fewer restrictions, thus opening a wider window of opportunities for them. This added flexibility can reduce the chances of construction professionals leaving the field for other professions, thus ensuring a more constant and stable supply of human resources. Overall, these combined advantages will ultimately lead to a healthier industry and promote a better image for the entire profession.

ACKNOWLEDGEMENT

The authors would like to thank The University of Hong Kong for funding this study through the Leung Kau Kui Endowment Fund (Grant No.: 21374100). The support of the Quantity Surveying Division of the Hong Kong Institute of Surveyors is also gratefully acknowledged.

REFERENCES

- Boyd, O. (2008a) Fears grow over Dubai market as projects hit delays, *Building Magazine Online*, Oct 31,
http://www.building.co.uk/intl_story.asp?storycode=3126254
- Boyd, O. (2008b) China announces £374bn financial recovery package, *Building Magazine Online*, Nov 10,
http://www.building.co.uk/intl_story.asp?sectioncode=779&storycode=3124646&c=3
- CNN (2008) Economist: China, India Critical, *CNN World Business*, Nov 18,

- <http://edition.cnn.com/2008/BUSINESS/11/18/apec.china.ap/index.html>
- Gallagher, D. (2008) China unveils stimulus package as grows slows, *Market Watch*, Nov 9,
http://www.marketwatch.com/news/story/china-lifts-wraps-stimulus-package/story.aspx?guid=%7BA9B776C7%2D8961%2D4C92%2DB15F%2D15E97470645E%7D&dist=msr_7
- Stewart, D. (2008a) UAE puts up £7.34bn to avoid property crash, *Building Magazine Online*, Sept 23,
http://www.building.co.uk/intl_story.asp?sectioncode=284&storycode=3123216&c=3
- Stewart, D. (2008b) Dubai developer to cut 200 jobs as credit crunch worsens, *Building Magazine Online*, Nov 11,
http://www.building.co.uk/intl_story.asp?sectioncode=284&storycode=3127229&c=1
- Stewart, D. (2008c) Largest developer in Gulf may cut jobs, *Building Magazine Online*, Nov 13,
http://www.building.co.uk/intl_story.asp?sectioncode=284&storycode=3127522&c=1
- Willoughby, M. (2008) New city development planned for Qatar, *Building Magazine Online*, Oct 31,
http://www.building.co.uk/intl_story.asp?sectioncode=779&storycode=3126557&c=3

BIOGRAPHICAL NOTES

Dr. **S. Thomas Ng** joined The University of Hong Kong in 2000 as an Assistant Professor and is now an Associate Professor. He worked in the construction industry for more than ten years and participated in a number of prestigious construction and civil engineering schemes. He held lecturing positions in various universities in Australia and Hong Kong. His research interests cover construction industry development, contractor and consultant selection, time/cost estimation, delays mitigation, and IT in construction management and economics.

CONTACTS

Dr. S. Thomas Ng
Department of Civil Engineering
The University of Hong Kong
Pokfulam
Hong Kong
HONG KONG SAR, CHINA
Tel. + 852 2857 8556
Fax + 852 2559 5337
Email: tstng@hkucc.hku.hk