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Enhancing University-Industry Collaboration via Teaching Company Scheme: A Case Study on Research Partnerships in Hong Kong

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ABSTRACT
The concept of partnering has gained growing attention in the research community in the past two decades. Various issues associated with partnering have been widely investigated in the prevailing literature. These research efforts have built up a solid theoretical foundation for partnering development. A review of prevailing literature indicates that case study, survey and interview are the common research approaches employed for partnering research. Close collaboration between the industry and university can facilitate the research process, especially on soliciting information and insights from practitioners in partnering. To facilitate collaboration between industry and university, the Hong Kong Polytechnic University (PolyU) introduced a collaborative platform, termed as Teaching Company Scheme (TCS), which enables companies to take on university’s research expertise to conduct business-specific research projects. At the same time, universities can put the research deliverables into real business world to increase practical values of research. This paper aims to introduce the organization and operation of TCS by a case study on a successful TCS between a utility company in Hong Kong and PolyU. This paper concludes that the TCS is an effective means to foster collaboration between industry and university, resulting enhancement of both theoretical and empirical development of partnering research.

KEY WORDS
Teaching Company Scheme, TCS, partnering, Hong Kong

INTRODUCTION
Partnering, being a member under the umbrella of Relational Contracting (Chan et al., 2009), has drawn attentions from academia and the construction industry in the past decades in view of its claimed benefits of better time and cost control resulted by improved relationship and communication among project participants. (Cowan et al.,
Partnering has been evolving since its early development in the UK (Bennett and Jayes, 1998) and US (Cowan et al., 1992) in the 1980s. It can be seen from the prevailing literature that partnering has gained more and more attention in the construction industry. Various issues associated with partnering, such as critical success factors, benefits, barriers of implementation, contractual arrangement and partnering performance measurement, have been widely investigated in the prevailing literature. These research efforts have built up a solid theoretical foundation for partnering development. However, empirical evidences supporting the partnering concept are still scanty in the prevailing literature, resulting an imbalance between theory development and empirical support. Development of partnering requires support from empirical evidences as Li et al. (2000) pointed out that “the lack of rigorous empirical research in partnering has resulted in minimal improvements in our understanding of the concept”. Although certain amount of empirical partnering studies have been conducted in the last two decades (Cowan et al., 1992, Weston and Gibson, 1993, Gransberg et al., 1999, Chan et al., 2008, Black, 2004, Chan et al., 2004), the scope and amount of these empirical evidence are relatively insufficient. Tang (2006) asserted that lack of deeper understanding on the underlying principles of partnering and how to realize the partnering mechanisms in practice have hindered the development and wide spread of partnering in the construction industry.

Most of the empirical research about partnering employs either case study approach or survey and interview approach. Bygballe et al. (2010) conducted a review on 87 papers about partnering from 4 top-rated journals, among which 31 papers adopted case study approach while the other 32 papers opted survey or interview approach. The success of case study and survey approaches for partnering research primarily depends on the support from the industry, especially in providing necessary practical information and insights on partnering or completing survey. However, it is not uncommon that response rate to survey of practitioners in the construction industry is below 30% (Ogunlana, 1999). The common low response rate to survey implies that support from the industry on partnering research is insufficient, which hinders the empirical development of partnering.

A NEW PLATFORM FOR PARTNERING RESEARCH

This paper aims at promoting an alternative approach for partnering research, termed as Teaching Company Scheme (TCS) and sharing the experience of a TCS in Hong Kong. TCS can enhance collaboration between industry and universities for more insightful
partnering research by setting up a platform facilitating knowledge and technology transfer from universities to the industry and vice versa.

BACKGROUND OF TCS
The history of TCS can be dated back to the 1970’s. Jones and Craven (2001) stated that the UK government have supported the TCS between universities and the industry since 1975, aiming at facilitating technology transfer between academia and the industry. The development of TCS was originated from the arrangement of Teaching Hospitals for training up medical professionals. Peattie (1993 P.60) stated the primary objectives of Teaching Hospitals are:

1. **Raise the level of industrial performance by effective use of academic resources**
2. **Improve industrial methods by the effective implementation of advanced technology and new ideas**
3. **Help graduates with careers for industry**
4. **Give academic staff broad and direct involvement with industry in order to benefit research and enhance the relevance of teaching**

The development of TCS has realized the above objectives and resulted in a win-win-win situation, in which company, researcher and university under the TCS would be benefited. In Hong Kong, TCS has been strongly supported by the Innovation and Technology Commission of the Hong Kong Government, which has established a University-Industry Collaboration Program (UICP) with a clear objective of:

> **UICP aims to stimulate private sector interest in R&D through leveraging the knowledge and resources of universities. The emphasis is on close collaboration between private companies and universities in Hong Kong.** (ITF, 2010)

ORGANIZATION OF TCS
Each TCS is typically funded by both the involved company and the university. Governmental funding may also be available such as in the UK and Hong Kong. The TCS employs a graduate as a Research Associate, who carries out daily research activities with supervision from a TCS management committee comprising of senior management of the company and the academic staff from the university. Alternatively, the involved company can also nominate its staff as the Research Associate.

To fulfill the expectation of academia and industry, TCS requires the management committee to develop a set of mutually agreed objectives for the research project. This arrangement provides an effective platform for enhancing collaboration and exchanging ideas between universities and the industry. Designing an academically and practically viable research has been a challenge to academia as it requires collaboration and
significant inputs from both academics and practitioners. Under the TCS, the involved company provides practical insights on the research projects while the university provides academic and consulting advice. Their consolidated inputs can create a research project with both academic and practical values. The TCS research project can also be viewed as a bridge for exchanging ideas and experiences of the industry and university, resulting in a high level of synergy.

The appointed Research Associate implements the agreed research activities under the joint supervision from both industrial and academic supervisors, by which the Research Associate can gain real-life exposures in the business world and practical research experiences. The organization and inputs from the involved parties are shown in Figure 1.

![Figure 1 – The organization and inputs from different parties under a TCS](image)

**CASE STUDY**

A TCS has been established in 2009 between a utility company (Company X) in Hong Kong and the Hong Kong Polytechnic University (PolyU) for a partnering related research. The organization, operation and progress of the TCS are presented in the following sections.

Company X has adopted non-contractual partnering for its projects. After implementing partnering for 5 years, Company X would like to capture the partnering experiences and enhance its partnering performance for their future projects. With consideration on the unique operating regime and business environment of utility business in Hong Kong,
Company X initiated a TCS for developing a practical management framework to enhance its partnering performance.

*TCS Management Committee*

A management committee was formed under the TCS. Company X has appointed three staff as the TCS chairman, Industrial Supervisor and Research Associate respectively. PolyU has also appointed two academic staff as Principal Investigator and project coordinator. Figure 2 shows the composition of the management committee.

![Figure 2 – The composition of the management committee under the TCS](image)

*Operation of the TCS*

Regular meetings have been conducted within the TCS management committee and the Research Associate. This interactive process allows Company X to express their concerns over the partnering projects, while the Principal Investigator and the Project Coordinator can fine tune and derive specific research objectives with the Research Associate for the best interest of both parties. Throughout the course of the research project, the regular meetings within the TCS management committee serve the purpose of monitoring and reporting the research progress.

*Outcomes of the TCS*

The progress of the TCS is encouraging. Two partnering review workshops have been successfully conducted with engineers from Company X and those consultants, contractors and sub-contractors involved in the partnering projects. The Research Associate was the facilitator of the two workshops under supervision from the TCS management committee. The review workshops offered valuable insights to the research
projects, particularly in refining the research objectives. The key insights captured form the review workshops include:

- The existing KPIs cannot effectively reflect the actual performance. It was found that the contractors have got high KPIs scores but the clients were not satisfied with the contractors’ performance.
- The scores of KPIs are sometimes arguable as it mainly depends on subjective judgments, and the client and the contractors have different views on the scores of KPIs.
- The contractors were underperformed due to lack of motivations
- The diverse stakeholder objectives have been aligned in the senior management level through the partnering processes but the alignment is weakened in the middle and frontline level, resulting traditional adversarial situation.

These specific practical insights from practitioners are hard to obtain otherwise. The insights from the review workshops have refined and validated the practicality of the research objectives, which include development of a set of company specific Key Performance Indicators (KPIs) for measuring partnering projects; exploring an optimal contract strategy; review and development of incentive scheme for a partnering contract and identification of critical success factors for implementation of partnering in the utility business context.

The TCS established an effective platform for knowledge transfer between university and the industry. The development of KPIs for partnering projects is an example. Yeung et al. (2007) from the PolyU have developed an objective and reliable Partnering Performance Index (PPI), employing the Delphi survey method, for assessing partnering performance of construction projects in Hong Kong. The established methodology, with improved objectivity and reliability, has been adopted for the Company X under the TCS for developing a set of company-specific KPIs for partnering projects. The university can be benefited from a higher application rate of its research outcomes in practice, which can in turn increase the credibility of the research outcomes. The Company is also benefited from applying some well established and state-of-the-art research outcomes for resolving business problems in a cost-effective manner through the TCS.

In addition, the TCS has facilitated relationship building and communication between the university and the industry. It not only fosters the application of research outcomes from university into practice, but also provides an effective channel for industry’s feedback regarding the practicality of research.
CONCLUSIONS

TCS has been adopted for different technology related research with proven effectiveness and synergy. This paper shows that TCS can also be applied for partnering research, by which collaboration between academia and industry can be fostered. It also shows that all parties under the TCS can be benefited in different perspectives. For participating companies, they can benefit from applying the state-of-the-art research deliverables according to their business needs. The Research Associate can acquire practical research experience in a genuine business environment, while the university can benefit from establishing close links with the industry.

Under the TCS, the Research Associate has been received full support from Company X in conducting the research, including allowing access to data of previous partnering projects and conducting a survey and interview to the relevant staff with a guarantee 100% response rate. These supports can facilitate the whole research project and increase efficiency of conducting empirical research. More importantly, practical insights from practitioners can be captured and fed back to the research community for identifying future research direction, which are essential to the empirical research development of partnering research in particular.

For the community as a whole, the TCS not only enhances the practicability of research but also helps develop a group of high caliber, young, technically and managerially sound researchers and professionals for the future of the construction industry. This alternative research approach is recommended for partnering research in the construction industry such that more empirical research evidences can be obtained for advancing the development of partnering in the construction industry.

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