

## **A Case Study of Outcome-based Education: Reflecting on Specific Practices between a Malaysian Engineering Program and a Chinese Science Program**

Daniel Kuok Ho Tang

BNU-HKBU United International College

### **Abstract**

Outcome-based education (OBE) has permeated the education systems globally and has been upheld by the Washington Accord for accreditation of undergraduate engineering programs. Its implementation has extended beyond engineering to many other programs. This study adopted a reflective approach in comparing the specific cases of OBE practices of an undergraduate engineering program and a science program in two different countries based on recollection of involvement in the OBE practices. The reflected aspects covered the alignment of outcomes, the design of assessments, teaching and learning process, and measurement of outcomes. The reflection shows that the engineering program has a more formalized and prescriptive approach to OBE than the science program and there is greater emphasis on quantitatively determining the attainment of program and course outcomes. The science program, however, has a more flexible structure of OBE and more diverse channels of gathering data for outcomes attainment. It is deemed that a structured OBE that confers greater flexibility in accommodating different learning needs and gauging of achievement would be helpful to the OBE practices of both programs. OBE, as an educational theory, needs to be internalized by educators to optimize its impacts. It should ideally move on from the showcase of outcomes and numbers which may at times, compromise educational quality.

*Keywords:* accreditation, outcome-based education, reflection, undergraduate, Washington Accord

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Corresponding author: Daniel Kuok Ho Tang. E-mail: [danielkhtang@uic.edu.cn](mailto:danielkhtang@uic.edu.cn)

## **Introduction**

Outcome-based education (OBE), otherwise known as standards-based education emphasizes the achievement of goals or outcomes by students in the teaching and learning process (Morcke et al., 2013). The implementation of OBE is not constrained to specific formats or assessments. Various means such as assignments, class activities, examinations, presentations, projects, and practicums, can be employed to facilitate the achievement of learning outcomes by students (Mukhopadhyay & Smith, 2010; Tang & Kurnia, 2015; Tang, 2020a). OBE has been practiced globally at various education levels from primary to tertiary. For instance, Australia's adoption of OBE dated back to the early 1990s though its implementation differed across states (Donnelly, 2007). In the United States, OBE was already practiced since 1994 and was continuously improved subsequently (Glatthorn, 1993). OBE permeated the universities in Hong Kong in 2005 while it was incorporated into the Malaysian public-school systems in 2009 (Kwok, 2000; Mohayidin et al., 2008).

OBE promulgates that teachers should change their role in the classroom from information providers to facilitators of learning (Morcke et al., 2013). While there have been arguments on its effectiveness, it is currently still influential in many education systems,

particularly in undergraduate engineering education under the Washington Accord (Brady, 1996). The Washington Accord is an international agreement for accreditation of professional undergraduate engineering degrees which permits accredited undergraduate engineering degrees of a signatory to be recognized by other signatories. It regulates the quality of the degrees offered in the signatories and acknowledges their equivalence (Mahmood et al., 2015). As of 2020, there are 22 signatories including Australia, Canada, Chinese mainland, Hong Kong SAR, India, Japan, Korea, Malaysia, New Zealand, Singapore, the United Kingdom, and the United States. Each signatory of the Washington Accord has an entity assigned to oversee the accreditation of its engineering degrees (Wilson & Marnewick, 2018). In Australia, the institution is the Engineers Australia while in Chinese mainland, it is the China Association for Science and Technology. The accreditation institutions in Hong Kong SAR and Malaysia are the Hong Kong Institution of Engineers and the Board of Engineers Malaysia respectively (International Engineering Alliance, 2021). The Washington Accord has specifically required the implementation of OBE as a condition for accreditation (Liew et al., 2014).

While OBE has conventionally been practiced by engineering degrees offered by signatories of the Washington Accord,