

Chapter 7

Towards a Magic Cube Framework in Understanding Higher Education 4.0 Imperative for the Fourth Industrial Revolution

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ABSTRACT

Higher Education in the Fourth Industrial Revolution, or HE 4.0, is an umbrella term for accommodating different manner of teaching and learning, research and innovation, service, and infrastructure that are often portrayed as key elements of a university. Despite the imperative of HE 4.0, the truly transformed HE environment is still far from reality. This discrepancy raises many questions such as (1) What makes HE4.0 so special? and (2) How could the potential good of HE 4.0 be unlocked? This chapter seeks to add to the literature by offering a “magic cube” framework, which includes diverse axes, faces, and layers/slices, in understanding various inter-related factors. The result of this study (i.e., the magic cube framework for HE 4.0) is developed to support all stakeholders of higher education system to fully grasp the strengths of HE 4.0 in response to the Fourth Industrial Revolution.

INTRODUCTION

The fourth industrial revolution is fast approaching us. On the one hand, the news is good for higher education (HE) institutions. With the increase in the income level, the numbers of enrollments are up. There's a continuing specialized talent shortage, creating excellent opportunity for research-driven public- and private-sector relationships (Lee & Miozzo, 2015; Salleh & Omar, 2013; The Economist, 2008). And more important, the current technological trend in digitalization has a profound effect on institutions' performance, academic achievements, and students' satisfaction (Castañeda & Selwyn, 2018; Hedberg,

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2006; HEFCE, 2010; Kukulska-Hulme, 2012; Marshall, 2010; Ng, 2015; Potkonjak et al., 2016; Xing, 2015). On the other hand, despite the fast pace of change in the digital technology landscape for today's HE system, the press (Dickson, 2017; C. A. Frey & Osborne, 2015; Mezied, 2016; West, 2018), academic papers (Krueger, 2018; Lamprini & Bröchler, 2018; Peters, 2017; Xing, Marwala, & Marwala, 2018; Xing & Marwala, 2017), government/consultant reports (Brown-Martin, 2017; Mulgan & Joshi, 2016; National Research Council, 2002), and books (Gleason, 2018; Jung, Horta, & Yonezawa, 2018; Maasse, Nerland, & Yates, 2018; Porter, 2015; van der Zwaan, 2017) keep raising imperative questions around the future of HE, such as how HE institutions would be affected by the fourth industrial revolution, how to use various advanced technologies in the educational environment as effectively as possible, and how the delivery of HE could be transformed?

The author believes in the era of fourth industrial revolution, altering HE is more necessary than ever before, since breakthrough technological inventions alone are not sufficient, diffusion of new technologies is critical (Peters & Besley, 2013). Therefore, this chapter intends to highlight multiple aspects that this grand conversion (HE 4.0), is taking or going to take place. Reviving an ancient system will be by no means easy. But it does promise a better and universal higher education. Rarely have demand and occasion so neatly come together. Rather than bolstering up the old model, governments should follow this sweeping tendency, adapt to and concentrate on making it work better.

Briefly, the remainder of this chapter is organized as follows: Subsequent to the INTRODUCTION section, the *status quo* of our society is discussed in BACKGROUND section. Then, the workbench of the proposed framework, namely, magic cube, is detailed in THE WORKBENCH OF MAGIC CUBE section which is followed by the MAGIC CUBE FRAMEWORK DEVELOPMENT section. Next, the future work is highlighted in the FUTURE RESEARCH DIRECTIONS section. Finally, the CONCLUSION section closes this chapter.

BACKGROUND

Though the business of HE remains unchanged much since its inception – Aristotle taught at the Athenian Lyceum – today young students still assemble at a scheduled time and venue to listen to the wisdom of scholars. Now a new industrial revolution has begun, thanks to several forces such as financial pressures (mounting costs), technological achievements (upsetting technological advancement), and sustainable requirement (diversifying demand). The result of this upside-down course will be the rebirth of the university – HE 4.0.

Past Futures of Our Society

We all recognize that our society is changing rapidly. Indeed, change rather than stability is the order of the day. However, change doesn't care if you're ready. In other words, if anyone is failing to clearly understand the history and characteristics of those changes – and failing to alter the method to cope with those changes – s/he will lose opportunities.

To understand the present future of our society, i.e., fourth industrial revolution (to be discussed in the next subsection), one need to first understand the concept of industrial revolution and three preceding generations of industrial revolutions. According to Cambridge Dictionary (Cambridge Dictionary, 2018), Industrial Revolution can be defined as “[...] the period of time during which work began to be

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