Chapter 3
The Digital Transformation of Higher Education:
The Challenges of the COVID–19 Pandemic

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ABSTRACT

The improvements in digital technologies have changed societies in many ways. This process is commonly called "digital transformation." Many sectors have been affected by digital transformation, including higher education institutions. Also, the COVID-19 pandemic, which started in 2019 in China, triggered the use of digital technologies in everyday activities and at every level of education. This chapter primarily presents the process of digital transformation in higher education by giving examples from various countries based on recent research, providing challenges of digital transformation of higher education, and then examining the challenges and reflections of the COVID-19 pandemic on the digital transformation of higher education. Lastly, the current situation is evaluated, and suggestions are proposed.

INTRODUCTION

The dramatic enhancements in technology have been affecting various aspects of human life. Societies have to keep pace with new digital changes. How people communicate and collaborate, the structures of the institutions and the ways businesses are conducted have been changed for every sector. With the improvements and their impacts, Digital transformation (DT) has become inevitable and taken an important place for both researchers and practitioners recently, especially during the Covid-19 epidemic. DT term was firstly mentioned by Patel and MCCharty (2000). Later, it was defined by various researchers. The different definitions of DT imply that DT is not only using technology. It also refers to "the changes that digital technology causes or influences in all aspects of human life" (Stolterman & Croon Forst, 2006, p. 689). The main point of DT is to focus on innovative solutions instead of focusing on the technology itself or just using traditional Information Technologies (IT). New innovative approaches

and digital technologies serving DT include cloud computing, the internet of things (IoT), big data and data analysis tools, smart systems, and social media (Hai, Van & Thi Tuyet, 2021; Schwertner, 2017). New digital technologies have changed the ways businesses are conducted. There is plenty of research in the literature investigating the DT process in different sectors, such as the manufacturing industry (Singh, Sharma & Dhir, 2021), the automotive industry (Llopis-Albert, Rubio, Valero, 2021), finance sector (Karagiannaki, Vergados & Fouskas, 2017), and healthcare (Ricciardi et al., 2019). Commonly, digital technologies are essential to the existence of companies since the firms and companies that did not adopt digital technologies have disappeared, such as Borders, Blockbusters, and Kodak (Tolboom, 2016).

Similarly, the education field has also been affected by digital technologies. A new concept has emerged, which is "Education 4.0". It is used to express the DT of education with advanced digital technologies and their impacts on education. The DT of the educational activities and institutions does not depend only on technology. It requires technological, human, organizational, and pedagogical drivers and new teaching and learning strategies (Oliveira & Souza, 2022). The first objective of this book chapter is to define the DT in higher education. Also, examples of the educational DT projects from different countries are presented.

DT in organizations and education has been accelerated by the covid-19 epidemic (Soto-Acosta, 2020). Although the DT process in higher education started before Covid-19, it has been slower than in other domains. The Covid-19 epidemic, which is an unforeseen event affecting all the people in the world, has required and triggered innovative online solutions for educational activities and accelerated DT of higher education (Bogdandy, Tamas & Toth, 2020; Kang, 2021). The transition from the traditional classroom to online platforms dates back to the 2000s (VanSickle, 2003), and it has become mandatory with the Covid-19 epidemic for all countries in the world. There are different types of traditional and emerging technological opportunities for educational activities in higher education, such as tablets, smartphones, Smartboards, Learning Management Systems (LMS), video conferencing tools (Zoom, Skype, Microsoft Teams, Google Meet ...etc.), social media applications. However, universities have been unprepared for the fast transformation needed due to the Covid-19 epidemic. The second objective of this book chapter is to investigate how the Covid-19 epidemic has affected DT in higher education and identify the challenges.

In this context, this chapter aims to reflect an understanding of DT in higher education and guide future research by providing the current status of DT in higher education and examining the needs of the Covid-19 epidemic on DT. This chapter answers the following two research questions based on the existing studies in the literature: *(i) What is the current situation of DT in higher education, (ii) How Covid-19 epidemic affect DT in higher education?* The rest of the chapter is organized as follows. First, DT in higher education is reviewed and detailed, focusing on the definitions and technological examples from the domain. Second, the unforeseen reflections of the Covid-19 epidemic on DT in higher education are presented. Third, the challenges of DT in higher education are identified from the current research and presented. Lastly, the current state of the DT in higher education is evaluated, and suggestions are made.

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