Chapter 24
Education for the Digital Industry:
Opportunities and Challenges of Experience–Based Expertise and Open Innovation

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ABSTRACT

Education holds the power to transform and enrich the lives of people. In the era of the digital industry, where data is omnipresent in every walk of life and new trends impact society and future jobs, humans continue to evolve through education and developing mechanisms to improve education with data science in the heart of it. This chapter demonstrates that experience-based expertise and open innovation must be understood as a single process, where living labs that involve academies and enterprises create unique conditions for society's progress. There is a trinomial relationship between academy, society, and industries, which are interestingly far more exploited than the education and research. Effective management of the knowledge and information transferred between open innovation ecosystem partners is crucial. The scientific development of both concepts is an active field in the academic community, and new ideas appear, opening new paths of knowledge transfer methods with knowledge from data.

INTRODUCTION

Education is the key to shaping the lives of people. It holds power to transform and enrich it. Since the dawn of civilization, humans have evolved through education and have developed mechanisms to improve education. In the 21st century, where data is omnipresent in every walk of life, education is no exception.

Due to the recent explosion of big data, our society has been rapidly going through digital transformation and entering a new world with numerous eye-opening developments. These new trends impact society and future jobs, and thus student careers. At the heart of this digital transformation is data science (Braschler, Stadelmann, & Stockinger, 2019; Song & Zhu, 2017).

The three main differences between the fourth and previous three industrial revolutions are speed, scope, and systemic impact. Compared to earlier industrial revolutions, the fourth is developing exponentially rather than linearly (June Kim, 2021). Are the current education systems and paradigms oriented towards the values and goals of Industry 4.0? It does not always seem to be so. A 20th-century educational model is mostly still leading, introducing standardized facts and procedures designed to prepare the workforce for jobs that probably may not exist for a long time. It is not enough to cope with future challenges.

According to Vygotsky's Sociocultural Theory of Cognitive Development, "learning from experience is the process whereby human development occurs" (Vygotsky, Cole, John-Steiner, Scribner, & Souberman, 1978). Although experience is essential to learning, it is not enough; one has to do something to construct knowledge. Building an environment where students feel free to expose their knowledge state and compassionately help each other learn is incredibly difficult (Chkoniya, 2021). The idea of a growth mindset was first described by Carol Dweck (2017). Their research points out the importance of students believing that they can improve through practice. More interestingly, perhaps, they offer suggestions as to how to foster growth mindsets, such as praising effort instead of skill (Dweck, 2019; Hicks & Irizarry, 2018).

Business operations are undergoing drastic changes due to the disruptive effects of technological innovations, and it has consequences in the education sector (Oke & Fernandes, 2020). There are two essential dimensions of the learning process: grasping and transforming experience. A firm's capacity for accumulation is its most crucial technological asset. Therefore, the following virtuous cycle should be established: first, practical knowledge is accumulated systematically in the workplace; second, the knowledge should be scientifically codified. Third, the documentation of this codified knowledge should be conducted so those good textbooks can be produced. Fourth, training and teaching methods should be developed and tested in terms of their effectiveness and validity. Fifth, the new practices established on the foundation of the newly codified knowledge should be tried, and the performance of these trials should be evaluated objectively. Then, this cycle should be repeated, starting with the first phase (Lee et al., 2018).

This chapter demonstrates and gives an example that Experience-Based Expertise and Open Innovation (OI) must be understood as a single process. It is essential to create knowledge and transfer it, ensuring that the flow of knowledge takes place in a bidirectional way.

Background

Since Klaus Schwab and the World Economic Forum declared the arrival of the Fourth Industrial Revolution, there has been much discussion about it. The so-called fourth industrial or digital revolution is characterized by the unification of technologies that breaks the boundaries between physical, digital,

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