Chapter 14

Technology Readiness for Education 4.0: Barriers and Opportunities in the Digital World

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ABSTRACT

The chapter aims at investigating the relationships between human resources and ICTs with the aim to underline what barriers and opportunities are emerging in digital societies. As a matter of fact, the production, through the concept of Industry 4.0, is requiring advanced training of the workforce. To address these challenges, the chapter specifically provides a wide conceptual framework for describing the relationships between human resources and ICTs in the Industry 4.0 framework. After this, the attention is focused on the construct of technology readiness as a way to clarify human resources’ reaction to the introduction of new technologies and digital instruments. Finally, the proposed conceptual framework is used to trace possible guidelines for the management of educational programs.

INTRODUCTION

The increasing attention about the emerging challenges and opportunities derived by the Information and Communication Technologies (ICTs) is attracting interest and effort from multiple research domains (Powell & Dent-Micallef, 1997; Luftman et al., 2004; Haddon, 2004; Bates et al., 2011). Several innova-
tions provided by the ICTs such as 3D printing, virtual markets, and online communication instruments can be considered disruptive changes for both social and economic configurations (Wolpert, 2002; Assink, 2006; Del Giudice et al., 2016; Caputo & Walletzký, 2017; Santoro et al., 2017; Aquino et al., 2018). New business models are emerging as consequence of the ways in which actors interact and information are shared in the digital world (Caputo, 2017; Di Fatta et al., 2016; Scuotto et al., 2017). Recognizing the variety and the variability of this emerging scenario, practitioners and researchers are called to focus their attention on the way in which it is possible to support the ongoing evolution maximizing positive outcomes and forecasting and reducing possible risks (Del Giudice & Straub, 2011; Barile et al., 2015; Carayannis et al., 2017).

Among the multiple contributions provided in this direction, several advancements in knowledge have been provided (Henderson & Venkatraman, 1993; Brynjolfsson & Hitt, 2000; Melville et al., 2004) and to the possible implications for marketing strategies and approaches (Carson, 1990; O & Pinsonneault, 2007; Constantinides & Fountain, 2008; Golinelli et al., 2012) but still few contributions seem to be available with reference to the role of human resources and to the ways in which they can react to the increasing pressure of ICTs (Paré & Tremblay, 2007).

With the aim to bridge this gap, the chapter aims at investigating the relationships between human resources and ICTs with the aim to underline what barriers and opportunities are emerging in digital societies (Caputo et al., 2016; Amendola et al., 2018; Carayannis et al., 2018). As a matter of fact, the production, through the concept of Industry 4.0 requires advanced training of the workforce. Advanced education, also called Education 4.0, and networked ecosystems need to develop skills for the new age of production by addressing the growing need for skilled employees. Indeed, it is estimated that over 3 million new jobs will be needed over the next decade (Wef, 2017). In order to avoid a lack of skills, it is important to reshape education production methods, linking the industry with educational organizations.

To address these challenges, the chapter specifically provides a wide conceptual framework for describing the relationships between human resources and ICTs in the industry 4.0 framework.

In particular we aim at highlighting the contribution of the Technology Readiness that is then reframing knowledge management in the light of the studies rooted in the Information Asymmetry and Cognitive Alignment with the aim to explain from conceptual point of view the reasons that affect human resources in their interaction with technologies.

Finally, the proposed conceptual framework is used to trace possible guidelines for the management of educational programs in order to reduce the stickiness of human resources in technology based innovation process and to maximize positive outcomes in the relationships between human resources and organizations’ technology infrastructures.

**HUMAN RESOURCES AND INFORMATION AND COMMUNICATION TECHNOLOGIES: EDUCATION APPROACHES AND REFLECTIONS IN THE LIGHT OF TECHNOLOGY READINESS**

In recent decades, science and technology have brought unexpected improvements to the living conditions along the Triple Helix Model. The dissemination of information and the new technologies sustained by the “Knowledge Society” have progressively stimulated a strong process of transformation, thus influencing working styles and organizations. The result of these changes has been that tangible