Impact of Technology Ambiguity on Leadership in Global Higher Education

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INTRODUCTION

The twin forces of technology and globalization have created an environment of increasing complexity for leaders in higher education. On one hand, higher education is faced with educating and serving students who comprise the second generation of students who have been characterized as digital natives (Prensky, 2001) and digital learners whose familiarity with technology implies a necessity to leverage that expertise. At the same time, there is disagreement regarding what that familiarity means. Some authors have proposed that the highly regarded expertise of first-time students entering higher education is more myth than reality (Gallarde-Echenique et al, 2015; Jackson 2015). The fact that even those writers who assume a high degree of technological literacy for students in institutions of higher education also point out that students born before 1980 are less familiar with technology than those born after, implies that institutions of higher education must manage to serve students with a wide range of technological literacy.

At the same time, the students presently served by higher education are faced with a world characterized by tremendous change that is occurring with a rate that is dizzying. Much has been made of the statement by former Secretary of Education Richard Riley to the effect that the top ten jobs of 2010 will not have existed in 2004 (Peterson, 2009). Arguably, the proliferation of new technologies and resulting employment opportunities have transformed the job market creating new challenges for institutions of higher education (Pence, 2007). Many of these new jobs will be in information technology (Denning, 2014). One example of a change in the job market related to changes in technology and the global threat to technological infrastructure in industry, education, and the government involves the projected shortage in cybersecurity professionals in the coming decade (Denning & Gordon, 2015; Keller, 2014).

Globalization adds to the layers of complexity and ambiguity for leaders in higher education. Beerkens (2008) defines globalization as "a process in which arrangements--be they economic, political, and cultural—become disembedded from their territorial context" (p. 19) and are "driven by the transnational flows of people, products, money and ideas, while at the same time encouraging those flows to become more massive and intense" (p. 19). As contributors to the knowledge economy, universities and colleges have long served local and national interests, and, beginning in the 1960s with the increasing convenience of international travel, the knowledge needs of other nations. As technology, particularly since the 1990s, has made global communication vastly more convenient, higher education has been able to serve as the provider of knowledge throughout the world (Beerkens, 2008) at a pace that is almost

instantaneous, creating new markets but at the same time adding multiple levels of complexity to the missions of institutions of higher education.

Colleges and universities have long been contributors to the knowledge economy and as such have been at the same time acted upon by global forces (Marginson & Rhodes, 2002) and been actors on the global stage in providing services through cross-border initiatives that are often comprised of sites located not within the institutional nations of origin but at locations throughout the world, even on other continents (Marginson & van der Wende, 2007). That those cross-border initiatives can be provided through distance learning technologies opens the possibilities for vast new markets, particularly with the advent of Massive Open Online Courses. MOOCs promise to cut costs while providing services to tremendous numbers of students worldwide. With the demand presently outstripping the supply (Russell, 2015), MOOCs promise to continually disrupt the higher education model, particularly when emerging technologies in data storage, artificial intelligence, and assessment are factored in enabling the MOOC model to be profitable (Carr, 2012).

The combined forces of technology, new generations of students, uncertainty in the job market and economy, globalization, and all that they imply for higher education have created a landscape of tremendous complexity with strategic directions difficult to predict. The fact that these forces interact on a global scale creates non-linear change with the appearance of chaos owing to the many degrees of interdependence and interaction (McChrystal, Collins, Silverman, & Fussell, 2015). This increase in complexity in the higher education sector implies a need for leaders who have the cognitive complexity (Dragoni & McAlpine, 2012) to lead strategic design and implementation initiatives in the coming years.

Student-Technology Intersection

Institutions of higher education throughout the world have the task of preparing students with a wide ranging levels of comfort and degrees of familiarity with the teaching technologies that are available. Prensky (2001) identified those students who have grown up with the availability of computer technology, the internet, smartphones, and immersion in gaming as digital natives. Those students who have by necessity become familiar with these technologies as they have evolved (and as their integration into use has evolved) have adopted the use of technology as a secondary culture and are thus digital immigrants. We are presently in an era characterized by students entering the higher education environment who are second generation digital natives who, because of their use of digital social networking through robust portable technologies, have even more positive attitudes toward the seamless integration of technologies into their lives than the previous generation of digital natives (Joiner, Gavin, Brosnan, Cromby, Gregory, Guiller, Maras, & Moon, 2103). What Prensky (2001) called a "ubiquitous environment" (p. 1) characterized by the "sheer volume of interaction" (p. 1) caused the first generation of digital natives to "think and process information fundamentally differently" (p. 1) than previous groups of students. The second generation of digital natives have grown up in a technological environment characterized by new web technologies that enhance gaming activities and entertainment in the form of downloaded music, movies, and what was formerly television programming (Gallardo-Exhenique, Marques-Molias, Bullen, & Stribos, 2015). In this new environment, in-person socialization is enhanced by social networking sites and participation in internet groups (Shapiro & Margolin, 2014). Hoffmann, Lutz, and Meckel (2014) have outlined a social cognitive construct related to information and communication technologies and point out that this new generation of student has a high degree of comfort with the online environment because of a cognitive schemata that is profoundly different from that of the previous generation growing up with the internet, and far from that of those who were present for the initial development of com-

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