Digital Transformation in Higher Education

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Digital transformation in higher education does not merely refer to a technological transformation. From an institutional perspective, the digital transformation in a broad sense is understood as a way to determine the stakeholder needs and behaviors in advance, and to provide education, research, and social services in line with the demands of the pupils who take advantage of the services in a changing environment. For this reason, digital transformation in education is being implemented worldwide step-by-step, with attention being paid to helping students with digital tools that can be reachable wherever there is an online computer terminal. Saving time and resources by means of online management and tuition seems to be the consolidated challenge. This means the digitalization of core services, having academics and students with advanced digital capabilities, and decision support systems that can adapt to changing circumstances.

Keywords: digital transformation ; higher education ; Latin America ; institutionalism ; Chile

1. Introduction

The present public health emergency due to a global pandemic has accelerated the pace during a mandatory lockdown. According to the above-mentioned literature and several authors in particular [1], three contextual considerations have arisen from this period. The first one points out that organizations must improve their digital maturity. The second one shows that less digitally mature organizations are more fragile. Finally, organizations are supposed to be generally more flexible with higher levels of digital maturity.

Bearing these aspects in mind, there is no doubt within this context that diverse social, organizational, and cultural backgrounds configure the transition to digital transformation in education, regarding not only contextual cues, but also several categories of social, organizational, and cultural situations. Historically, the role of a university has evolved from a former cultural role, through research-driven scientific advancement in the service of economic development to further optimize its own self-interest, to a brand-new social role (“the university for others”) [2][3]. In the words of one author, “automation will make many jobs obsolete before long”, therefore higher education institutions must meet the pace of digital transformation to survive and furthermore, deliver their subjects in a more flexible way, reinforcing their institutional function as organizations for change. Information is key for social development [4][5], and higher education institutions play the role of conveying it to society by using effective tools and strategies [6][7] after thorough managerial work before this role is performed by teachers. The information digital transformation challenge, according to universities, requires an adaptation to society’s needs.

To promote educational digital transformation in terms of connectedness, students and professors linked through the internet or remote maintained machinery give a systemic and institutional perspective that is not new to educational institutions [7]. Although the decomposition of degrees into smaller open-source learning networks will provide the skills needed for a job, and every single second data emerges digitally from every action commanded on online sources, this massive amount of data must be understood within a context which makes sense of it [8][9]. To meet both academic and institutional needs, numerous groups all over the world are following the trend of using Artificial Intelligence that emulates human behavior [10] to forecast what actions will be needed according to data and environment dichotomy, and to give a response to every remote stimulus, which is the core of the Fourth Industrial Revolution in education [10][11]. In this line of research, digital transformation in higher education institutions comes from managerial work, supported by institutional structures based on human, organizational, and technological resources.

2. An Institutional Perspective of Digital Transfomation in Universities

Universities were the center for knowledge production and dissemination for centuries. These elements have been challenged over recent decades by a parallel ecosystem which plays the same role, based on the Internet [12]. The access to knowledge worldwide is no longer restricted to the physical space of the university, but it is found in different platforms, applications, encyclopedias, and open-source web browsers that allow people to learn about diverse issues, which is the

trademark of the digital era. This new scenario represents a challenge rather than a threat for higher education institutions, especially in Latin America and the Caribbean (LAC), where transformations occur in a slower way in comparison with developed countries [13].

Besides the manufacturing industry, academic institutions are certainly involved in Industry 4.0 [14]. Although ancient wisdom is sheltered in digital libraries which collect the roots on which development is built, innovation means gathering different branches of knowledge and obtaining something new from them [15]. According to an institutional perspective, among all academic institutions, higher education institutions are prone to give specific tuition in every discipline, exploring every field, making connections, and bridging the gaps between them.

However, several authors point out that academic institutions are often considered cutting edge centers, whereas diverse evidence shows that universities encourage mainly conservative and gradual research instead of audacious and innovating research [6][16]. According to this approach, business excellence in a volatile, uncertain, complex, and ambiguous environment (BEVUCA) [17] has much to contribute to higher education to fill the gap by considering the overall VUCA influence and the influences of each specific term individually [18]. New epistemologies and paradigm shifts have been proposed [19], according to Big Data [20][21][22], claiming “the end of theory” by promoting the creation of data-driven science, instead of knowledge-driven science, and developing the digital humanities, as well as the computational social sciences, which show alternative ways of approaching culture, history, economy, and society [23].

Because digital innovation in education is dependent on responsive leadership, considering higher education institutions as businesses that set relationships between stakeholders, mentors, and supports, is a recent model that has focused on developing managerial competences besides technical competences based on a comparison of technology maturity models [24]. This model is organized in six steps: Identification, Definition, Design, Development, Evaluation and Communication, offering an important guideline in this way:

- Identification, where the competences required should span from the ability to monitor, analyze, and comprehend the benefits of technological trends, to the deep knowledge of the organizational business structures, processes, strategies, in order to disclose possible convergences between the two;
- Definition, which includes the setting of the necessary resources and tools for starting the digital transformation process. The competences required should be at the organizational level (resource management, and so on), and at motivational level, so that a common vision of the process of transformation can be effectively communicated and shared among diverse actors;
- Design, where the technical competences for integration purposes, as well as business process design competences for process re-design, are both necessary;
- Development: Project management competences are highly required in this phase for the organizational and coordination aspects of the project;
- Evaluation: in this phase data analysis capabilities facilitate the evaluation of the risks and the impact of the project in terms of a high volume of data that should be gathered, elaborated, interpreted, and communicated;
- Communication. In this phase, a set of competences are related to leadership, communication skills, persuasion techniques, and the ability to gain approval for the project results.

3. Conclusions

The increased global presence of technological advancement highlights a rapid transformation in higher education. This type of phenomenon has grown rapidly on a grand scale by leveraging the growth of virtual learning and its global impact in particular. At the beginning of the XXI century, economic power shifted towards digital industries. Higher education institutions’ increasing role as major global actors has attracted global attention in both developed and underdeveloped countries. Given recent digital developments, some institutions may choose to temporally refocus on growth in their domestic and international segments and markets.

The results showed that universities attach more importance to the institutional perspective and the adoption of a particular development strategy. It suggests that the process of digital transformation has a wide and relevant range of impacts on technological change in higher education institutions. The analysis also suggested that the vision plays a role in every aspect of the university’s organizational structure.

A relevant finding was that, while all higher education institutions are governed by their respective states and national policies, access to information goes beyond national boundaries; therefore, it is important to have a global platform to exchange and to discuss how new technologies are transforming education. For managers of the educational institutions to understand how a university operates utilizing a technological structure, certain established norms and regulations about the educational ecosystem and field need to be addressed. The first established norm and regulation to be addressed is that higher education institutions are not vision-focused and are only concerned about making utilities. The literature and the data suggested that to be successful, both public and private higher education institutions need to be vision-oriented and intentional about how the staff realize that mission and its vision. Public universities have published missions that are similar in scope to those for private institutions and, as the data from the Chilean case suggested, are used for making both strategic and operational decisions.

Nowadays, higher education environments are experimenting with changes due to an increasing unpredictability. Educational institutions are diverse in nature and scope, and they operate in very different contexts. However, technology has an impact on the skills and competences required by students to take part in society, and on how to access information and knowledge, particularly. Although this transformation is taking place in different ways and by different means and opportunities, one important aspect in this line is how to shape higher education in a digital world.

Not only small- and medium-sized universities, but also other educational models in higher education possess the advantages of flexibility and adaptability, which helps them cope with technological advancements and combine student-focused approaches with the social aims of public and private institutions to maintain competitiveness and sustainability. According to the results here described, the consultation affirmed that a great majority of the respondents in the leadership consultation considered digital transformation a high priority in general.

The open consultation carried out by IAU demonstrated existing inequalities in terms of access for exploring the potential of technology in higher education, for example, in case of internet infrastructure. This constitutes a significant threat to future societies and illustrates the divergence between those who have access and those who have not. The existence of different educational ecosystems has stimulated a debate about the different technological structures available to higher education institutions in Latin America.

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