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Research plan on the digital transformation of faculty to advance to the global era

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ABSTRACT

Achieving academic continuity in the face of the CoVid-19 pandemic demonstrated the universities' ability to respond to the challenges of sudden and disruptive external changes. More than ever, technology became the enabler of learning. Faculty and students quickly needed to develop new skills in the short term to finish the academic term that had been interrupted. The situation required integral digital transformation. The purpose of this document is to present the status of a doctoral-thesis research plan for creating a university digital transformation model supported by the measurement of media literacy. We propose a mixed study with a concurrent-triangulation, sequential-explanatory design that allows us to analyze quantitative and qualitative results and consider the impact of technologies that support media literacy on professors and digital education production teams within university programs. The expected results will lead to proposing a university digital transformation model that supports media literacy development in the academic community and training for the labor market in the digital age. The document is organized in nine sections: context and motivation that drives the dissertation research, state of the art, hypothesis, research objectives, research approach, and methods, results to date and their validity, dissertation status, expected contributions, and conclusions. The pre-research project, the preliminary planning of the research, and the research method and analysis proposal have been carried out.

CCS CONCEPTS

- Social and professional topics
- Professional topics
- Management of computing and information systems

KEYWORDS

Media literacy, digital transformation, Models, Higher Education, Educational Innovation

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1 Context and motivation that drives the dissertation research

Achieving academic continuity in the face of the CoVid-19 pandemic demonstrated the universities' ability to respond to the challenges of sudden and disruptive external changes. Most governments worldwide were forced to close educational institutions at all levels temporarily in an attempt to contain the pandemic. The closures affected 1,465,679,660 students, 83.7% of all students enrolled (data as of April 2020) [1]. In Mexico, 6,404 higher education institutions, 4.7 million students and 429,495 teachers [2] were impacted. Institutions had to rethink how to offer their academic programs, train their faculties, and adapt their administrative processes to continue operating. Universities with experience in distance education were able to respond sooner; they had the infrastructure, technologies, experts, and training programs that enabled the remote modality in all their programs. However, less

experienced universities leveraged open platforms, courses, and educational resources to teach remotely [3]. As technology became the enabler of learning, both faculty and students needed to develop new skills in the short term to continue with the academic term.

Our review of recent literature presents only a few cases of university adoption of a systematic and orderly digital transformation process. Moreover, in Mexico about 50% of 76 universities reported having fewer than 100 interactive courses or resources in digital format to support presential or non-presential classes [4]. This scenario is challenging, nevertheless it is imperative that universities initiate or continue their digital transformation.

Due to this situation, in our research, we aim to propose a university digital-transformation model supported by media literacy metrics that can serve as a reference for other universities engaging in digital transformation. Then, having the basis to respond to external changes, to what extent, and how, would the university's digital transformation be transmitted due to the media literacy of the professors and digital-education production teams?

The document is organized in nine sections: context and motivation that drives the dissertation research, state of the art, hypothesis, research objectives, research approach, and methods, results to date and their validity, dissertation status, expected contributions, and conclusions.

2 State-of-the-art

2.1 Digital transformation

Digital transformation has impacted all organizational areas by pushing the evolution of its components, whether technology, administration, information systems, and its people. Digital transformation is understood as the "process that aims to improve an entity by triggering significant changes in its properties through combinations of information, computing, communication and connectivity technologies" [5, pp. 118]. This transformation has relied on new technologies, social networks, Big Data, and the Internet of Things (IoT), among others. Almost all industries, including computer science, engineering, business, and social sciences, have incorporated them [6]. As a result of the transformation, new products, processes, distribution channels, and supply chains have emerged, including new business models [7]. Organizations must recognize the contributions of these technologies and determine how to advance from their current state.

In digital transformation, the organization may be forced to adopt innovative technologies because their users, collaborators, or customers employ them. In the digital world the introduction of a new technology is not always carried out by an expert or someone in high administration; these may cease to be the protagonists [8]. The

organization's digital transition can be accomplished in phases, from converting analogous information to digital ("digitization"), and subsequently incorporating digital technologies to modify processes. The most impactful changes occur in the digital transformation of the business model [9]. In recent decades, both society and organizations have adopted new digital technologies.

An essential element of digital transformation is the workforce. The organization requires that its people have the necessary digital skills to execute the changes in processes and operations [9][10]. Leaders should also have experience in transformation projects and directly align their incentives with the strategy's objectives and progress [11]. People need to train in digital skills to be able to function in the new world of work.

2.2 Media literacy

The skills necessary for new digital computer technologies and innovations are linked to media literacy. The skill requirements are not static; they change rapidly due to technological advances [12]. Also, these changes demand a continuously updated workforce to keep up. Those who are not digitally literate or who have low digital-literacy levels will be less likely to have the confidence, knowledge, and understanding to participate in a secure and informed manner in a digital environment [13]. Skills that were traditionally considered specific to certain positions are now basic to most.

The digital skills required to operate the new jobs demand continuous updating of people. They must be able to manipulate devices and machines, understand the operations they perform [14], and be facile with technologies such as the Internet of things, robots, augmented reality, artificial intelligence, and mobile application devices like tablets and phones [15]. This changing scenario challenges both today's workforce and higher education students.

Current university students with access to technology have been adopting and incorporating the changes into all their activities. They perceive technology as a pivot for the information society and an invaluable resource offering personal and professional development opportunities [16]. Thus, family, government, media, and the university must participate and respond with appropriate training programs to develop digital competencies in their students and employees [17]. University programs must facilitate teaching-learning processes in which students can receive, produce and issue messages critically and creatively [18]. In addition, to preparing students for change, the university must also recognize that it is also the subject of digital change, that is, the university must adapt to incorporate new technologies and digital trends into its operations.

2.2 Digital transformation of the university

In recent decades, the university has been transforming the way classes are taught and adapting administrative and communication activities to remain relevant to new generations. Nevertheless, digital transformation encompasses much more than the implementation of new ICT technologies. Both employees and users support and adopt the changes implemented, otherwise, it may be difficult to achieve the digitalization and be counterproductive [19]. Consequently, the university's digital transformation represents a process of technological and organizational change induced by the development of digital technologies [20]. The university's strategy towards digital transformation should consider change management issues such as integration and raising awareness of those involved.

The university's progress towards digitalization can vary among its different units and groups (faculty, students, employees). The university must identify its digital transformation status and determine what aspects and technologies it should incorporate into its processes, in addition to selecting the best way to carry these out [21][22]. Some universities have modernized their buildings and incorporated innovations into their educational models. However, there has been restraint in implementing changes in other areas such as marketing and attracting students [23]. Therefore, to attain an organic implementation and deployment, the university should have a clear strategy for achieving digital transformation.

3 Hypothesis/thesis and/or problem statement

This research proposes the following hypothesis:

Hypothesis: If the university successfully incorporates digital transformation in its educational model and enables operational processes to adapt to sudden changes, the transformation is transmitted due to the professors' and digital-education-production teams' media literacy.

4 Research objectives/goals

The research's general objective is to analyze the development of media literacy required by the work environment, by evaluating the impact of digital transformation on faculty and digital-education-program production teams, and propose a university digital transformation model.

The specific objectives of this research are:

1. To contrast strategies and technologies derived from digital transformation impacting education and the enablers of the university's main functions areas.

2. To analyze the impact of digital transformation on the development of media literacy in faculty and production teams for digital education programs.
3. To design a university digital transformation model that enables developing media literacy in the academic community for training the future workforce required in the labor market of the digital age.

5 Research approach and methods

5.1 Research Method

A mixed method will be implemented to develop this research. The combination of quantitative and qualitative data better responds to research [24][25][26]. The design is concurrent-triangulation, sequential explanatory, which consists of analyzing quantitative and qualitative data using procedures to triangulate the findings and interpretations, in two sequential phases. It is sequential-explanatory because data will be carried out in two phases. First, the quantitative research results will be explained by subsequent qualitative information [29]; then, the process is repeated in reverse in phase two.

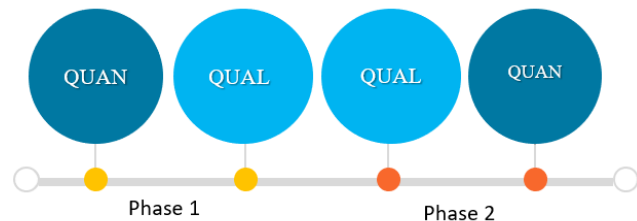


Figure 1: Research design

In the first phase (QUAN-QUAL) Likert scales will be applied to faculty and production teams involved in online courses, and interviews will be carried out. In the second phase (QUAL-QUAN) focus groups will be applied to the same population (faculty, and production teams) to detect key elements to design the Likert model proposal. Afterward, Likert scales will be applied to the same population, so as to validate the proposal.

5.2 Population and sample

The study population corresponds to professors and online-course production team at a private university, Tecnológico de Monterrey. For selecting the sample, a probabilistic (QUAN) and intentional (QUAL) sampling will be used.

5.3 Study Variables and Instruments

The following study variables have been considered:

1. The university's digital transformation is understood as technological and organizational change induced by the development of digital technologies [20]. Digital transformation is described as creating networks of actors such as companies and clients in all segments of the value chain, and the application of new technologies [30].
2. Media literacy entails empowering the person to interpret media content, develop critical reflection and become a media creator and producer, to promote equal access to information [16].
3. Organizational models of digital transformation: The digital transformation of business models refers to both the individual elements and the entire business model itself, the value chains, as well as the network of the different actors involved. Enablers and technologies are used to generate new applications or services [28]. Aspects to consider for achieving digital transformation in an organization are client-centered strategy orientation, the, ICT's, process infrastructure, talent, capacity building, the culture of innovation, and organizational commitment [6].

These variables will be analyzed with the following instruments

- Likert-scale survey applied to professors and a digital-education-course production team, to research their digital skills (variable: digital literacy).
- In-depth interviews with professors and production team. Open questions related to the university's digital transformation status. (Variable: digital literacy and digital transformation of the university).
- Focus groups: with professors and digital-education-course production team to research their digital skills (variables: digital literacy and digital transformation organizational models).

5.4 Information sources

Participants: professors of digital education courses and members of the digital-education-course production team.
 Digital or printed material: Scopus and WoS articles, books, e-books, media literacy videos and digital transformation.

5.5 Information collection and analysis

The collection of the information and the analysis will be done in two phases as indicated in figure 2.

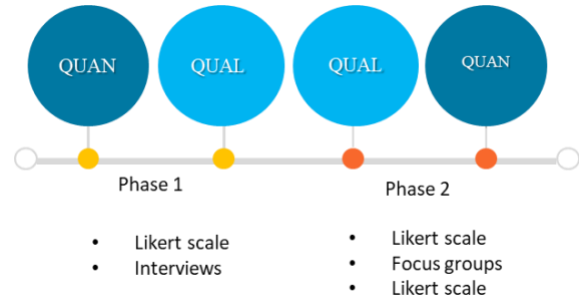


Figure 2: Information collection

In the first phase, Likert scales surveys will be applied to professors and production teams involved in online courses, as well as interviews. For this purpose:

- A conceptual instrument support will be designed.
- The instruments will be designed and piloted with qualitative (expert) and quantitative (statistical) validations.
- The instruments will be applied, and the data analyzed with mixed methods.

In the second phase Likert scale surveys and focus groups will be applied to the same population (professors and production teams) to detect key elements to design the model; afterwards, Likert scales will be used with the same population to validate the proposal. For this purpose:

- Focus groups will be piloted to validate the process.
- Focus groups with professors and production teams will be applied.
- The model proposal will be developed.
- The proposal will be validated with measurement through Likert scales.

The result will enable digital transformation model for the university to be designed.

6 Results to date and their validity

The digital transformation of organizations has evolved rapidly in the last two decades. A preliminary analysis identifies some models that have been designed to guide a transformation process that involves all business units. In the university case, a search will be carried out for documented experiences of its digital transformation.

7 Dissertation status

As the date of this document, the pre-research project, the preliminary planning of the research, the research's method proposal, and the subject of analysis have been carried out.

Current and expected contributions

This research aims to contribute to the current state of the strategies implemented in the digital transformation to serve as a basis for universities traveling this route to stay current in the face of change brought about by new technologies, and the demands of new generations. It will also analyze the impact of the adoption of technologies on media literacy development by university professors and digital- education production teams. Finally, we intend to develop a digital transformation model for the university to use to develop media literacy in the academic community and train its students for the labor market of the digital age.

Conclusions

Digital transformation has become the engine for organizational change, and the CoVid-19 pandemic accelerated this transformation for all sectors of society, which had to rethink the delivery of their products and services.

The education sector has not been the exception. On the contrary, 2020 has meant the implementation of remote learning at all levels of training, with the consequent adoption of technologies and didactic strategies that enable this learning modality. However, the change has not only impacted on processes, products, and services, but also on faculty, who has been responsible for implementing remote learning in the classroom.

Faculties have developed their digital literacy in a short time allowing them to ensure the academic continuity in this period. Technological skills to use new tools and platforms, didactic strategies to manage students at a distance, to transform present activities to the remote modality, and to produce and publish digital educational resources.

Given this situation, the university must be able to capitalize on the learning of this period, enhancing the best practices and correcting the areas of opportunity found in a systemic way to add value to its *raison d'être* and to the publics it serves.

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