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Emerging Technology and Tele-education for Learning in times of Covid-19 at the National University of Ucayali

By

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Abstract

This article is aimed at reveal the role of university actors and the mastery of technological tools in learning during the pandemic time. The objective of the research was to study the context of emerging technology and tele-education in student learning in times of covid-19, at the national university of Ucayali. The conceptual framework is based on the relevant trends of virtual learning, accelerating the process of tele-education, and digital innovation, which has allowed the use of disruptive technologies in new learning environments. The methodology used was based on the hemerographic analysis of newspaper reports, social networks and interviews, where the context of the process of university education in the region is shown. The results show that virtual education is widening educational and digital differences, putting at risk the equity of opportunities. Therefore, it is concluded that university education in the Ucayali region has suffered a flaw making it vulnerable; therefore, a comprehensive transformation is required to promote educational equity.

Keywords: Emerging technology, digital innovation, tele-education, disruptive technologies, learning environments.

Introduction

Nowadays, society handles increasing levels of information, making science evolve vertiginously, observing how the generation of understanding creates a dynamism that could hardly be absorbed with sufficient speed by organizations, thus hindering the process of habituation to the new scenarios that are presented together with modern technologies and the new emerging technologies as some authors call them (Díaz Pinzón, 2017, p. 116).

El ingreso al sistema educativo ha sufrido un incremento en los últimos años, generando riesgos en la calidad heterogénea del servicio, y que a su vez aspira ampliar la cobertura educativa, para dar respuesta a la necesidad de la población por acceder al sistema educativo. Sin embargo, no son muchos los cambios que se han dado para optimizar la calidad del servicio, conservando las diferencias entre los servicios público y privado; urbano, rural, indígena, desigualdades sociales que limitan y restringen la forma de la enseñanza.

Ante las distancias y la demografía de los territorios de todo el mundo, en el marco de la pandemia mundial por el Covid-19 se suspendió el servicio educativo presencial para evitar que las instituciones educativas propicien incrementos de contagio entre los estudiantes, mostrando desigualdades en el uso de la enseñanza virtual por la falta de infraestructura y la carencia de formación de la población (Porlán et al., 2020; Oliveros et al., 2018 & González y Cabrera 2010).

The adequacy of various organizations with their processes focus on the objective of improving and innovating new products and/or services; similarly, the development of novel information and communication technologies concerning the internet has opened new spaces in the educational field, and the design of websites that integrate various multimedia applications is allowing teachers to have new learning environments where interactivity and the role of the innovative instructor are highlighted, making it easier for the student to develop their process of learning (Díaz Pinzón, 2017; Mar & Mart, 2007; Adell & Castañeda et al., 2012; Distance Education, Its Challenges and Possibilities et al., n.d. & De Prada Pérez De Azpeitia & Levicoy and Ministerio del Ambiente 2016 & Picón et al., 2020; Oraá and Gómez 1997; Rubio 1999; De Belaúnde and Cotler 2011 & Mendoza 2019).

At the Universidad Nacional Ucayali (UNU), the lack of training of teachers and students has led to a lack of knowledge about learning strategies and emerging technologies, generating the improvised adaptation of emergency educational models, trying to adapt and integrate their processes and academic activities, through the use of platforms that lead to a new academic scenario. Thus, according to the problems presented, the formulation of the research problem would be: What is the context of emerging technology and tele-education in the learning of students in times of covid-19, in the national university of Ucayali?

Thus, this article is based on the analysis of newspaper reports, social networks and interviews, where the context of the process of university education in the Ucayali region is shown. Having as general objective to study the context of emerging technology and tele-education in the learning of students in times of covid-19, in the national university of Ucayali, from which the following specific objectives are derived: (a) To observe the context of emerging technology in its strategic dimension of technological innovation and student learning in covid-19 times, in the national university of Ucayali, (b) to analyze the context of emerging technology in its dimension of Automatic Learning and student learning in Covid-19 times, in the national university of Ucayali, and (c) to expose the context of emerging technology in its dimension of learning environments and student learning in covid-19 times, in the national university of Ucayali. Justifying itself as it will provide updated theories and information on the improvement plan of blended learning and the management of the evaluation process in teaching-learning at the National University of Ucayali, for its continuous improvement.

In the **scientific justification**, the study seeks in a socio-critical epistemological way of its design focused on the scientific method, to analyze the variables objectively. For this, it will be contrasted with the results acquired from the scientific analysis and the theoretical bases revalidated in virtual education. About the **methodological justification**, it is intended to create and arrange a resilient virtual education model, aiming at assisting the progress of capacities. So, demonstrating its validity and reliability will allow it to be used as a background for future research specifically related to competencies.

As for the social justification, it will contribute to the constant expansion of the demand for virtual education, demanding the insertion of virtual environments with flexibility and accessibility that encourage the active contribution of the agents, developing their professional skills and competencies. As for the theoretical justification, Bernal (2010) points out that the reasons why and what for the research to be carried out, consists of stating the reasons why it is important to carry out the study, to generate reflection and academic debate on the existing knowledge (p. 110).

On the other hand, the practical justification seeks to solve a problem and propose strategies to be applied in research studies, which could solve real problems if they were carried out. On the theoretical bases, regarding the emerging technology, these are shown as a necessity within society, generating multiple accelerated changes, the increase in demand and updating of information and new knowledge becomes a persistent demand. One of these innovations motivates changes in habits and practices (Vito et al., n.d.).

The strategic dimension of technological innovation is considered one of the fundamental pillars that relies on profitability, growth and competitiveness, as an essential factor of its perpetuity, to assert in industrial companies the survival of a correct improvement of manufacturing processes and application of new product development technology (el Desarrollo Docente, México, Chávez Guerra, 2013).

Virtual reality indicators are known as a three-dimensional environment generated by computers, in which you can manipulate the contents of that environment, facilitating the use of **edge computing**, which refers to the hosting and provision of services over the Internet, this, in turn, has unlimited capabilities in storage and processing, this is where the **internet of things**, take an emerging issue of technical, social and economic importance (Escartín Instituto Superior Politécnico & Echeverría, n.d..; Piedra García & Tenezaca Sari, 2018; Alejandro *et al*., n.d.).

The **Machine Learning** dimension is based on studies of algorithms that facilitate computers to improve performance in an ordinary least square regression model (Hansen, n.d.). From the **machine learning** indicators, it allows to analyze and generate a reason model, forming an artificial brain in an organism based on algorithms, having as support the information technologies, which will strengthen our neural network. While **deep learning** seeks to implement a virtual brain model from the use of software technologies, and the implementation of pure artificial intelligence, it generates hierarchical abstraction capacity (Jhan & Arteaga, n.d.).

In the **Learning Environments** Dimension, the physical and psychological environment is reaffirmed, which regulates the purposes, and evidences the need to migrate and have a **virtual educational environment**. In this way, **artificial vision** allows software development systems to provide a variety of artificial vision tasks. **Expert systems** use the model of human knowledge based on knowledge bases with inferences, managed by a computer to solve medical, engineering and other problems (Castro-Pérez & Morales-Ramírez, 2015; Huanca & Mhm_Inf, n.d.; Badaró et al., n.d.). On the other hand, Tele-education, through its teaching-learning modality based on information and communication technologies, incorporates the innovation of linear models in the cooperative work of its participants where they carry out training activities ("Tele-education: a way to connect the classroom with the environment," 2007).

Materials And Methods

In terms of methods, the literature review article is based on the formative quality of university education, and emphasizes two normative documents: the National Education Project which proposes "to achieve a basic education that ensures equal opportunities and educational outcomes of equal quality for all and closes educational inequity gaps", and the 2030 Agenda for Sustainable Development, which proposes "to ensure inclusive, equitable and quality education and promote lifelong learning opportunities for all" (Ministry of Environment 2016:19 & National Education Council 2006).

The analysis perceives a transitory argument of 5 months, from August to December 2020; focusing on finding indications of social difference forged by the complexity of financial, geographical and technological arguments in which university students are deployed in virtual education. The procedure employed was the documentary study, whose techniques were established in the hemerographic review of outstanding biographies and the exploration of scientific literature originated on the argument. The hemerographic review was placed in the analysis of numerous scientific sections and journalistic notes that address the topic under study, highlighting virtual education; and in the scientific literature review, several researches were considered, derived from the databases of Web of Science, Scielo, Google Scholar, Scopus, Latindex, Willis and others, which reveal scientific evidence regarding the research.

For this purpose, the following was considered:

a) Theoretical observation where the typologies that focus on the social discrepancy of the university formative service consider the conditions under which the university finds itself when exposing the interruption of face-to-face classes. Mentioning the context of the university community referred to the knowledge and use of information and communication technologies (ICT).
b) typification of learning skills and didactic resources for virtual education in Peru, through hemerographic reviews.
c) to implement virtual teaching environments where it allows access to students, according to the indications recognized on time, evidencing demonstrations of reflective explanations, using hemerographic reviews and scientific literature.
d) Deduction of the results of the increase in the university social difference generated by the current situation, initiated from the hemerographic reviews and analysis of the scientific literature.

This led to the analysis of the scientific literature, based on the context of Covid - 19, making important mentions of the studies developed concerning sociological reflections in the context of the university formative teaching process in times of health crisis, through the virtual teaching system (Tarabini & Gutiérrez-Moreno 2020).

Results

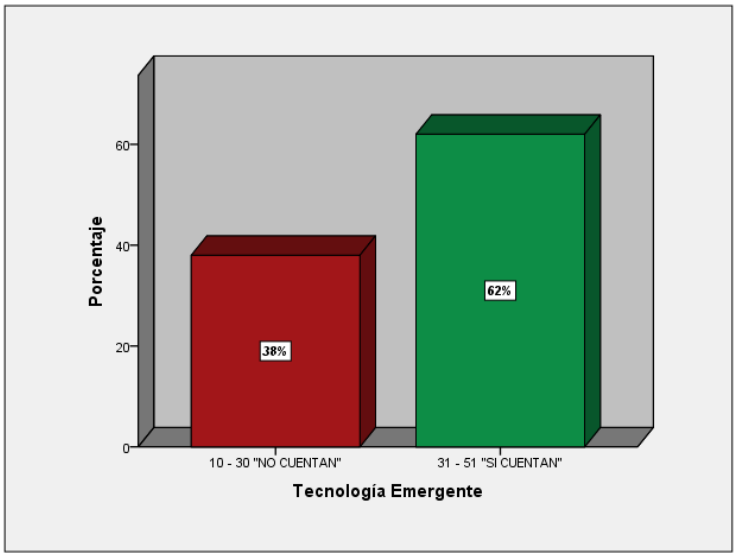
Without ignoring that the results of the research carried out have allowed processing and contrasting it from April to October 2020, which allowed obtaining evidence that the COVID-19 has revealed, through lacks and deficiencies in the educational sector, generating the increase of differences and disagreements to access the educational service. Peru is a country segmented by the differences and deficiencies in basic services such as health, education and others with inconvenient coverage and by the obstacles they present for their access (Mendoza 2019).

Table 1. *Technologies in use for Learning.*

Tecnologías	Puntaje
a) *Plataformas virtuales (*Moodle®, Classroom®, *etc.)*	4,17
b) *Aula virtual Dirección General de Escuelas*	2,66
c) *Videoconferencias (*Zoom®, MeetHangauts®, *etc.)*	4,16
d) *Grupos* WhatsApp®	8,83
e) *Foros de debate online*	2,11
f) *Redes sociales (*Instagram®, Facebook®, *etc.)*	3,54
g) *Elaboración de* Blog *o páginas* web *con contenido de estudio*	2,24
h) *Distribución de material impreso*	2,47

Source: *Own elaboration*

Figure 1. *Technological Resources*



Source: *Own elaboration*

Discussion

In relation to the discussions, the typologies of differences for access to quality educational services in the Ucayali region are: coverage, type of academic management, demographics, and growth of technological infrastructure. The last university education census, through SUNEDU, shows that 69.82% of university students have access to technological resources; a not so comforting figure, due to the difference of 30.18% of those who do not have equal access to quality education. There are several disagreements, starting from the type of academic management: the public sector serves 65% of the university population and the private sector serves 35% of the university population. Without ignoring that the growth of the technological infrastructure, with which each university counts, influences a lot in the realization of the activities of the learning process of the university student.

SUNEDU (2019) states that the National University of Ucayali, in its licensing process, stated that it has 31.2% growth and expansion in technological architecture. In basic services: water, drainage and electricity; it has 79.9% of its civil sanitation infrastructure. It is significant

to analyze the information and emerging technologies available to university students since the learning process in its virtual modality depends on this. According to the INEI (2019), during the 2017 and 2018 periods, it was established that 62.8 % of the students at the university stage in the Ucayali region have at least one technological resource; while 37.2 % do not.

It is worth mentioning that the analysis states that, out of every 10 students, 6 have at least one computer; 60.0 % are for exclusive use in academic activities, while 40.0 % share its use for work purposes. Not to mention that 58% of households have Internet access, and 42% do not. On the other hand, 60.01 % have a television; 40.09 % have cable tv service; 96.8 % have at least one cell phone and 35.2 % have a radio (Instituto Nacional de Estadística e Informática - INEI 2018a; INEI 2018b).

As for vulnerable groups made up of students with low income to cover their needs, victims of violence, disasters, very limited infrastructure, lack of internet access or students with disabilities, this generates a series of deficiencies in homes that hinder access to virtual education, required by the current situation. In this context, virtual education has begun to be delivered through:

(a) Virtual education platforms: Moodle, SWAD (Social Workspace At a Distance), Chamilo, Google Classroom and others, (b) Videoconferencing applications: Google meet, Zoom, Cisco Webex, Jitsi meet and others, (c) Instant messaging applications: WhatsApp, Messenger, Facebook and others, and (d) E-mail: Outlook, Gmail, Yahoo and others.

Because of this, difficulties in access and mastery of technology are observed, allowing the use of skills, and competencies to integrate digital tools with academic practices, through virtual education that has been imposed in Peru, and therefore in the Ucayali region, a model of teaching and learning.

Conclusions

University education in the Ucayali region has presented changes and differences in access to quality educational services, even before Covid-19. These difficulties refer to coverage, academic management, geographic area, and the growth of technological infrastructure. Without skimping, these differences have increased during the health emergency, causing many students to abandon the face-to-face modality, minimizing university academic coverage and jeopardizing its effectiveness.

Virtual education in the Ucayali region shows the shortcomings of university education, especially widening the gaps of educational and technological differences, to demonstrate that education in times of covid-19, ceases to be a right and migrates to become a sectorized service based on economic and technological resources. The new levels of access to education, conformed by students who have the necessary technological resources to face the virtual modality; isolating other groups to receive a limited educational service, due to the scarce economic and technological resources they have, totally discarding other vulnerable groups, to withdraw from the access to the new educational system, because they do not have technological resources.

The virtual teaching modality has merged the educational service with technologies, by establishing the levels and the economic, geographic and technological conditions of its actors.

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