

VIRTUAL EDUCATIONAL ENVIRONMENTS IN MEXICAN LEGISLATION

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Abstract— The purpose of this essay is to approach the legal view in which virtual educational environments are developed, which were exposed to the health emergency by COVID-19 from 2019 to date, and how the parliamentary scenario was responding. The article is developed under a descriptive and analytical approach, where it is intended that Higher Education Institutions have knowledge of the regulatory framework and verify if their educational platforms are developed within it.

Keywords— Educational virtual environments, legislation, education, educational platforms.

I. INTRODUCTION

Virtual educational environments or virtual learning environments (EVAs) have existed for a long time, however with the health emergency due to COVID 19, they were promoted in Educational Institutions due to the need to exhaust educational programs, providing a temporary solution to the situation that was experienced by the pandemic. The EVAs use Internet resources and other technological means to provide remote access, in order to share educational resources in a general way that contributes to the comprehensive education of students.

It is relevant to mention that virtual educational environments work from a legal basis, however this regulatory framework is unknown. When education is unified with virtualization, the need arises to disseminate the importance of the laws to make them known. For this reason, this research presents an analysis of the legislation applicable to virtual educational environments, exploring its conceptualization, its characteristics and the legislation applicable to them. Within the laws, the Education and Telecommunications and Broadcasting laws will be explored, as well as the Mexican Constitution..

A. VIRTUAL EDUCATIONAL ENVIRONMENTS IN HIGHER EDUCATION INSTITUTIONS.

Today, the contingency due to COVID 19 has targeted virtual educational environments for the development of the different contents of educational programs at all levels, however, we will focus on the higher level. Even so, for many this topic is unknown, despite not being new.

Vera [1] affirm that in the educational field one of the main problems faced by teaching methods is the separation of theoretical knowledge and practical training; Such a division has created very marked limits between learning concepts,

solving problems and carrying out laboratory practices, thereby limiting scientific learning. Faced with the problem of complementing the activities carried out physically, due to the time and resources required, a possible solution arises, which consists of the use of remote access virtual environments, which allow deepening the theoretical contents, allowing more practical experiences to be carried out. in less time and with the use of more accessible resources.

Virtual educational environments are a form of virtual teaching-learning, also known as e-learning, which usually have a synchronous and asynchronous student-teacher training, combining the necessary software and hardware means, being a structure of planned and complementary teaching that enriches knowledge and the way of transmitting information for their academic training.

Arroyo, Fernández, Barreto y Paz [2] They tell us that the use of virtual learning environments represents a paradigm shift in the ways in which the university teaching process is carried out.

As already mentioned, with the arrival of COVID 19, this began to materialize gradually due to the need for learning, and for this reason it was promoted to improve and perfect the way of teaching through these means, implementing many ways to put it into practice at way that students have a really satisfactory learning.

The author Cabral [3] affirms that, in his concretion to teaching, totally distance or mixed, he has given a place to different terms "e-learning", "tele training", "digital learning", which with nuances come to mean similar things. Although some of this training is limited exclusively to that carried out on supported digitized materials, on a web server to distribute the materials, in a web browser to access the information.

With what was outlined above, how we should understand virtual educational environments. Virtual environments represent an area that seeks to expand human capacity beyond its limits, using Internet resources and other technological means capable of providing remote access, making it possible to share educational resources in a general way; therefore, we define them as set of media or virtual tools that promote and favor learning in synchronous or asynchronous scenarios.

However, virtual educational environments have unique characteristics for managing teaching, learning and the relationship between teacher and student, remotely, which are called:

- **Electronic Environment:** This means that the way of communication between teacher-student will be virtual, with the help of ICTs (information technologies), that is, there will be no face-to-face contact with students, thus the synchronous sessions as close to a contact with your teacher for the development of the teaching-learning process.

- **Hosted on the network:** refers to the fact that the content can be accessed remotely, with special programs and with a device connected to the Internet.

- **Applications or computer programs:** they are a complement to the training activities of teachers and students.

- **Didactic relationship:** the way of relating will be digital, avoiding face-to-face contact.

For Boneu cited in Belloch, C. [4] there are four basic and essential characteristics that any e-learning platform should have:

- **Interactivity:** make the person who is using an education platform aware that they are responsible for their information.

- **Flexibility:** set of functionalities that allow the e-learning system to be easily adapted to the organization where it is to be implemented, in relation to the institutional structure, the study plans of the institution and, finally, to the contents and pedagogical styles of each educational organization.

- **Scalability:** ability of the e-learning platform to work equally with a small or large number of users.

- **Standardization:** Possibility of importing and exporting courses in standard formats such as SCORM.

These characteristics have an impact on the different types of virtual educational environments, since they help the general operation of e-learning and allow the usability of EVAs, such as:

1. **Open source:** The software (Open Source) is distributed with a license to be able to modify and view the source code of the application base.

2. **Free platform:** the use of the platform will not have any cost for acquisition or use license.

3. **Internationalization:** The platform must be translated, or must be easily translated, so that users can easily access and understand it.

4. **Technology used:** this means that part of a programming language, be it PHP, Java, Perl and Python, as it is an Open Source Language, specially dedicated for web development used on the GPL Platform.

5. **Wide user community:** the platforms must be active, since the dynamic interactivity of the users is important, regarding the Forums, technicians, developers and experts. With this, a community was born to interact with experiences, materials and educational resources.

Currently, with the technological revolution, effective e-learning platforms for learning have been added, which provided us with solid tools, available for educational needs,

with the contingency generated by COVID 19, virtual learning environments have become the key point of education, by becoming a fundamental part of teaching and learning. Today we have free and paid platforms specialized in it, being effective where its application and installation requires computer resources that facilitates the support of distance education and self-learning, some of them are:

- Teams
- Zoom
- Classroom
- Kahoot
- Blocks
- Social networks
- Seekers
- Videos
- Eminus (in the case of the Universidad Veracruzana)

In the virtual context, these tools are implemented and used for education, this in the way that the various supports are digital resources for the support of e-learning.

Ibaceta [5] show us graphically the tools included for the application of teachers to students in a virtual context.

Educational uses	Description	Platforms
Resource bank	Platforms that are mainly used to find resources and pedagogical materials that feed both synchronous and asynchronous classes	Youtube Pinterest Twinkl La Casa del Saber
Communication	Platforms and applications that are used as a means of communication with students and parents.	Gmail WhatsApp Web pages (of the establishment or personal) Social Networks Like: Facebook Twtitr
Didactic	Technological tools that allow synchronous interaction with students and between students during classes, as well as strengthening the didactics of the classes. In some cases, asynchronous platforms are used to strengthen learning through games.	Google Arts&Culture Padlet Mentimeter Boom Cards Worlwall La Casa del Saber Quizzy
Evaluation	The platforms that are used prioritize formative evaluation with the purpose of monitoring the level of achievement of the objectives proposed for each class, to reformulate teaching.	Padlet Mentimeter Boom Cards Worlwall Quizzy Kahoot Stream Yard Instagram Google Forms
Generation of teaching materials	Platforms or software that are mainly used to create both audiovisual	PowerPoint Canva Microsoft Word

	and graphic material.	Wondershare Filmora
Synchronous classes	Platforms used to conduct online classes synchronously.	Zoom Meet Master Class Teams
Repository	The repositories are digital spaces where activities, recorded classes, guides, tasks and various resources are stored to be available to students.	Youtube Web pages (of the establishment or personal) Master Class Google Classroom Google Drive Facebook

Table 1: Platforms with educational uses. Own elaboration with information from Ibaceta [5].

It is important to know how these platforms work, since they are a fundamental part of the e-learning structure in order to enrich the way of teaching and learning.

Boneu [6] mentions that current e-learning platforms offer many functionalities, which can be grouped as follows:

Forums: these allow the exchange of messages during the time established by the teacher. The forums are organized chronologically, by categories or topics of conversation and may or may not allow files to be attached to the message.

E-portfolio: it is a digital or electronic portfolio, it is a digital tool in which the teacher and the student can be supported, for the follow-up of the established activities, in addition to having remote access at any time. Work or activities can be saved in any format, be it multimedia files, images, documents and spreadsheets, among others.

File sharing: this is a fundamental part of educational development by allowing the student to complete the sharing of files digitally with teachers and classmates in a timely manner.

Support of multiple formats: All platforms must offer technical support for multiple file formats, such as HTML, Word, Excel, Acrobat, among others.

Synchronous communication tool: this is for the exchange of messages between users at the time of the virtual meeting, class or conference.

Asynchronous communication tools (emails or messaging): Mail tools allow you to read and send messages from within a course, or alternatively enable the possibility of working with external email addresses.

Multimedia presentation services (video conferences, video, among others): these services are not currently provided by the applications, with the improvement of the applications, you can share the screen to others synchronously, also the classes in a virtual way as it is the flipped classroom.

We must mention that over time the way of learning has been improved, but even so with details which will be perfected over time.

Currently, virtual environments have constantly improved by leaps and bounds, being able to see some advantages, but also disadvantages in the teaching-learning process under this modality, let's see:

Educational virtual environments	
Advantages	Disadvantages
Ease of adaptation of the new generations to virtual educational environments.	Internet connection failure.
Quick to link with multimedia applications.	Lack of interest of students to receive education under the modality of virtual environments.
Establishment of different channels of communication between teacher-student or student-student, and communication may be immediate.	Pandemics that cause students to support at home to provide economic support.
Adjustment and planning of times to carry out school activities at any time of the day, allowing other types of activities to be carried out.	Lack of planning and commitment to fulfill the activities designated by the teacher.
It promotes being self-taught, improving the way of personal learning.	Lack of computer equipment or technology, which allows enrolling in an educational program that is offered through virtual environments.
Immediate access to information for the resolution of tasks or school and academic activities.	Lack of training for teachers and students in the use of virtual educational environments.

Table 2: Advantages and disadvantages of Educational Virtual Environments. Own elaboration.

II. MEXICAN LEGISLATION APPLICABLE TO VIRTUAL EDUCATIONAL ENVIRONMENTS.

We know that virtual environments have the purpose of contributing to the development and implementation of educational practices that can be carried out remotely, allowing the introduction of pedagogical innovations in the ICT area by linking and integrating technological developments with educational practices. However, little is known if there is a regulatory or legal framework within which they are operating or developing.

Therefore, it is posed as a question: is there any legislation that frames the development of virtual environments in higher education?

To answer this question, we must start from the right to education, which is a fundamental human right that finds its constitutional basis in article 3 of our political constitution [7].

Article 3 of the Constitution mentions that everyone has the right to receive a universal, inclusive, public, free and secular education, where the State is in charge of it.

Further on, in its tenth paragraph, it refers to the educational space where the teaching-learning process takes place, in which the State... "will guarantee that the didactic materials, the educational infrastructure, its maintenance and the conditions of the environment, are suitable and contribute to the purposes of education". To do this, and framing our topic in this paragraph, we must understand that, in a context of a pandemic like the one we are still going through where virtual or online education has taken priority on the political and legislative agenda, the State must provide what is necessary so that the teaching-learning process continues.

In section V of the same constitutional article, reference is made to the benefits of the development of science and

technological innovation in education, where educational environments find their reason for being, from a legal point of view, by guaranteeing that students can receive their education through the development of technological innovation that meets the programs of each educational institution.

As can be observed, article 3 of the Mexican Constitution not only guarantees the right to education, but also mentions that the State has the rectory to provide an educational infrastructure where virtual environments have a legal network where they can emerge and make their way, especially in education that takes place in private or private educational establishments.

From this third article, we have its regulatory law, the General Education Law [8], which is intended to be public order, social interest and general observance throughout the Republic, therefore it applies to all Educational Institutions. From this law, which regulates the entire educational system, there are some analysis systems that are relevant for the framing of virtual educational environments, for example, in numeral 5 of the law in question, in its second paragraph, we find that the State must provide all people with the same learning opportunities, within this is access to the Educational System, where educational institutions will have to comply with the applicable requirements and provisions of the legislation.

In this law we find a relevant legal basis for the support of the investigation that is being developed, which is found in the ninth article, mentioning that:

Article 9. The educational authorities, within the scope of their respective powers and with the purpose of establishing conditions that allow the full exercise of the right to education of each person, with equity and excellence, will carry out, among others, the following actions:

... V. Make known and, where appropriate, promote various educational options, such as open and distance education, through the use of digital platforms, educational television and information, communication, knowledge and digital learning technologies; ...

As we can see in the cited numeral and remembering how we define virtual educational environments, they have become a tool for the educational system, more so in times of pandemic, finding that it is up to the educational authorities to promote educational options, highlighting the virtual education, the use and exploitation of digital platforms.

However, in article 30 section IV of the General Education Law (LGE), mention is made that within the contents of the study plans and programs the promotion of technology and innovation must be included, as well as their understanding, application and responsible use, of which we can add that through virtual educational environments it is possible to promote these contents through their use. This can be correlated with the objectives of the national education system, which, in order to achieve them, must carry out a strategic programming for an infrastructure, methods and educational materials that contribute to the continuous improvement of students (article 33 LGE).

In the LGE reference is made to the types, options and educational modalities, such as distance or non-school upper secondary education; where the educational authorities, according to numeral 46 LGE, within the scope of their powers, will have to establish policies that guarantee inclusion, permanence and continuity in this type of education (referring to the types, options and educational modalities). Educational Institutions at a higher level have found in virtual educational environments a way to give continuity to educational programs and study plans, occurring exponentially during the stage of the pandemic generated by Covid-19.

Also to the regulatory framework that applies to virtual educational environments, we can cite the Federal Telecommunications and Broadcasting Law (LFTyR) [9], where two articles make direct reference to the subject, such is the case of article 67 of said law that indicates the unique concession will be for public use where it is conferred on public higher education institutions to provide telecommunications and broadcasting services for the fulfillment of their purposes and powers (section II). In addition to this, in the fourth section of the same article, reference is made to the use of telecommunications for the social sphere, where the right is granted for cultural, scientific, educational or community purposes, without profit, being included in therefore the concessions are granted to private higher education institutions.

With this, we can see that the use of telecommunications can be employed to benefit education in all its forms. Adding that, in the law in question, it is attributed to the Ministry of Public Education to promote the use of information and communication technologies for the educational sector (article 218, section I, LFTyR)

Continuing with the legal analysis regarding the panorama of virtual environments and their use in education, we cannot ignore copyright, since much of the use of information sources in distance educational environments has been indiscriminate in this pandemic time. Many educational institutions, teachers and students, have used content available on the web to enrich their materials, activities or tasks, thinking that they are in the public domain because they are within reach of a click.

To this is added the management of personal data within educational platforms, or during virtual classes, for this, the Law on Protection of Personal Data in possession of individuals [10] must be taken into account. In this law, and adapting it to the school theme, it is mentioned that personal data (students), in the possession of individuals (educational institutions), must be protected in order to guarantee the privacy of their personal information. It should be considered that students and teachers share personal data or information for educational purposes, which must be kept secret, in addition, privacy notices must be considered when making them available to individuals (students, students, school authorities) through of visual, sound digital formats or any other technology that the educational institution makes use of.

It is a reality that the use of educational material in virtual environments poses challenges for teachers, institutions and students, who are unaware of their regulation.

CONCLUSIONS

Virtual environments have been a tool for education, but they must respond to current applicable legislation. The EVAs will continue to make their way in schools, but there is still a lack of training for teachers and students for their comprehensive and correct use. Higher Education Institutions have an important task to respond to the learning needs of their students by making use of educational platforms, adapting them according to their study plans, educational resources, economic resources and infrastructure, in addition to responding to legal regulations that surround education.

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