Analysis of Good Teaching Practices with the Integration of Virtual Environments at the Upper Secondary Level

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Abstract

This article analyzes the practices of integration with virtual learning environments, and focuses on knowing the teaching practices used with virtual environments in the Upper Middle Level (NMS) of the University of Guanajuato (UG). The purpose of this article is first to review the literature and obtain some teaching models on good teaching practices in virtual education that allow identifying characteristics of effective practices, and as a second purpose the results of a specific case study on the incorporation of practices with the use of virtual learning environments are analyzed. A bibliographic review of 3 proposals with 9 evaluation characteristics is analyzed, in which it was found that some of the teaching practices with the integration of virtual environments are: constant student-teacher communication, timely information feedback, flexibility in education and interactivity. Based on these proposals, a descriptive study was defined that was supported by the collection of data from an instrument applied to 20 teachers of the Upper Middle Level of the University of Guanajuato and the results allowed the identification of some effective teaching practices in the management of virtual environments.

Keywords: Virtual environments, teaching practices, digital education, modalities.

1. Introduction

We are immersed in the development of the digital world, which expands the way we communicate and deliver relevant information in various activities, especially academic. The teaching and learning processes have evolved in such a way that there is support from Information and Communication Technologies (ICT) in different environments and educational levels.

The use of ICT in the teaching and learning process is changing the way in which teaching is carried out. With the passage of time, new tools have begun to emerge that contribute to the improvement of teaching-learning processes through the internet, known as Learning Management Systems (LMS), which are virtual platforms that help create, manage, organize and deliver online teaching materials to students and often called Virtual Learning Environments (VLEs). (Correa, De La Hoz, & Henríquez, 2023)

It is important to highlight the use of technological resources that feed the teaching-learning processes, as well as the practices and interactions between teachers and students, it should be noted that in pedagogical management, the use of LMS generates interest, challenges and perhaps uncertainty in teachers, as it places them in front of an immense world of knowledge that confronts them with this new technological reality and to question themselves: How to develop their academic spaces mediated by technologies? ; Which tools are the most relevant? and How to adjust the orientation of their training objective towards the student and their academic space? (Levano-Francia, y otros, 2019)

One of the main challenges in education systems is to be focused on achieving an adequate level of digital educational content and on the practices carried out by the teacher, especially in the current context, although its design, implementation, storage and dissemination are often complex. UNESCO raises the need to encourage teachers to participate in training processes where they can generate digital content to put into practice when sharing their knowledge.(2022)

This is corroborated by the research of Arancibia et al. in which it is shown that teachers are forced to interact with technology by institutional requirement, by the nature of the Learning Units (UDA) they teach in complex situations such as COVID 19 and in some cases by the type of modality they are developing. Likewise, the need to know, through the development of the literature review and a descriptive study, the analysis of the practices carried out by teachers in the management of virtual learning environments, in order to describe them and thus achieve an orientation to their educational practice. (2020)

Regarding the above problem, this study is developed at the University of Guanajuato (UG) with teachers of the Upper Middle Level (NMS) who use virtual learning environments in their teaching practice.

2. Theoretical framework

Teaching with Information and Communication Technologies

According to Navarro and Texeira, with the use of ICT in education, LMS are incorporated into the teaching and learning processes, these platforms being interdisciplinary, whose development has been based on constructivist pedagogy, where learning implies an internal, subjective and personal constructive process, which Sánchez et al. He mentions that it combines aspects of constructivism (knowledge is generated through mediation and interaction with the environment) and constructionism (learning by doing), allowing collaborative learning.(2023)(2012)

The design of virtual teaching activities can be oriented in the light of several principles of this constructivist current such as: the active role of the student in the construction of meanings, the importance of social interaction in learning and the solution of problems in authentic or real contexts, which the teacher can take into account for the implementation of teaching strategies mediated by technology.

The technological innovations favored by the use of virtual learning environments offer us greater possibilities in the educational area, Rosetti López et al. They point out that in the

education systems of the future, teachers must build attractive learning activities, where people learn when and where they want, at their own pace and using the technological tools at their disposal.(2019)

Teachers have had to generate new processes to integrate in some way with technologies in the implementation of platforms that favor teaching and learning and with the different modalities and methodologies offered by their institutions, changing in turn the use of spaces and time spent in classes, which according to Moreno et al. (2016) This effect can be observed in the way teaching practices are executed, the form of organization and the form of school management.

The progress in the development of these concepts is so extensive that UNESCO has not only taken care to promote them, but has gone so far as to publish materials that guide the use of the best technologies and methodologies for the development of digital education. (Riande Juárez, 2023)

Modalities

One of the trends at the national and international level is distance and virtual education. Within it we find NMS PE, undergraduate and postgraduate, courses, workshops and diplomas under the e-learning or b-learning scheme. It is worth mentioning that e-learning models can have "virtual" learning classrooms in which participants will have to meet at least once during class sessions. In the case of the b-learning or blended-learning modality, interaction can be not only using the support of technology, but also with face-to-face sessions. (Reyes-Monjarás, 2018)

In Mexico, the National Education System (SEN) contemplates the schooled and non-schooled modalities, within each of these, various levels of academic training are included, ranging from basic or initial education to postgraduate education. In the state of Guanajuato, one of the representative educational institutions is the University of Guanajuato (UG), which offers Upper Middle and Higher Levels, which from the situation created by the national efforts to integrate technologies into secondary and higher education, detonated flexible education scenarios with the mediation of ICTs. The UG followed the taxonomy of schooled and out-of-school educational programs, the latter encompassing programs operated through technological mediations.

Within this mediation in January 2021 at the UG, the Institutional Development Plan (PLADI) 2021-2030 emerged, in which digital technologies are included as a fundamental part of essential university functions such as teaching. Within the institution there is the UG Digital Campus created in October 2020, a space in which all the educational offer converges in innovative modalities and which articulates the implementation of learning experiences in the face-to-face, blended and online distance modalities of the Educational Programs (PE) of Middle and Higher Level. in which Moodle is used as a virtual learning environment. (Universidad de Guanajuato, 2022)

The NMS of the UG is composed of a Colegio del Nivel Medio Superior (CNMS) which has eleven Schools of the Upper Middle Level in 10 municipalities (Celaya, Irapuato, León (2 entities), Salamanca, Silao, San Luis de la Paz, Guanajuato, Salvatierra, Pénjamo and Moroleón), where the curricula are carried out under the competency-based approach. and three educational

programs are offered (General Baccalaureate, Bivalent Baccalaureate, Bivalent Vocational Baccalaureate in Sustainable Processes).

It is important to note that in 2012, the NMS of the UG implemented a Methodological Guide for the virtualization of subjects for virtual learning environments, which had the purpose of facilitating the process and interaction for the generation of Learning Units for teachers, showing in a synthetic way the components, participants and minimum elements required for this purpose (Calzada Olmos, Muñoz Mújica, Ramírez Gasca, & Álvarez Torres, 2014)

In the records of the Digital Education System (SeDigital) of the UG with the methodologies established to date and the use of the virtual classrooms developed in the NMS by teachers, a record of their use in the years 2021 and 2022 was obtained as shown in Table 1:(2023)

Table 1 Number of classrooms and teachers that made use of digital classrooms

School	Average number of Virtual Classrooms used	Number of teachers
Celaya	105.3	65.8
Guanajuato	32.8	27.0
Irapuato	87.8	52.8
Lion	79.0	54.0
León Historic Center	43.8	33.5
Moroleón	24.0	11.8
Penjamo	20.0	18.0
Salamanca	147.3	74.8
Salvatierra	47.5	27.5
San Luis de la Paz	1.0	0.7
Silao	53.3	32.0

Note: This table shows the average number of virtual classrooms used by UG NMS professors during the years 2021 and 2022.

Virtual Teaching Best Practices

In the current context, teaching and learning depend critically on the knowledge and skills that teachers have about the use of digital tools and platforms, being aware of how they should be used and being able to organize the entire educational process with their students. (Díaz Quilla, Carbonel Alta, & Picho Durand, 2021)

Admiral et al. point out that teachers' attitudes towards technologies will determine the degree of use, both from a technological and pedagogical point of view, which will be determined by the degree of acceptance of LMS technology, which will be influenced by the diversity of tools it contains and by the diversity of tasks carried out by the teacher in the virtual classroom. and

in this way establish their teaching practice. (2017)(Díaz Quilla, Carbonel Alta, & Picho Durand, 2021)

A teaching practice is a set of educational interventions that facilitate the development of learning activities in which the planned training objectives are efficiently achieved and also other learning of high educational value. Durán Rodríguez and Estay Nicular in the field of good practices in virtual education take up the models of Graham et al. (2001), García et al. (2015) and Bolívar and Dávila (2016), which are summarized in Table 2:(2016)

The model of García, Guerrero and Granados (2015) proposes a guide of good practices, based on their teaching experience and their knowledge on the subject. In it, they establish a series of criteria to develop good practices in virtual environments. Its main contributions are the promotion between students and teachers to improve communication, promote cooperation, promote active learning, continuous feedback, and respect for talents and learning styles.

Graham et al. (2001) proposed in their research a list of seven strategies based on the principles of the Chickering and Gamson model with the aim of proposing a guide to evaluate the good practices of teachers within virtual classrooms. Where its important points are to promote cooperation between students, promote active learning, give feedback and recognition, as well as communicate academic expectations.(1987)

In the same sense, Bolívar and Dávila (2016), through their experience for a decade in the provision of virtual education, delimit a model of

good practices in virtual environments of higher education. It proposes to have a basic training that allows them to perform the role of teacher in a virtual environment, to program in advance the design of the course (materials, didactic support resources) and to design evaluation instruments. (Véliz Salazar & Gutiérrez Marfileño, 2021)

We know that the term good practices does not exist due to the consensus of various authors, but there are key terms that allow us to approach the concept and to be able to guide the teaching work to achieve the desired purpose.

3. Research design and method

The research in this study was carried out in two moments, in the first, a thorough review of various scientific articles from different academic and scientific databases such as Web of science, Scopus, Google Scholar, Scielo, Latindex and Dialnet was carried out in order to obtain technical knowledge about teaching practices in the use of Virtual Classrooms and to carry out a comparative analysis of models. The second moment consisted of a descriptive study that shows the phenomenon of teaching practices integrating virtual environments in the NMS of the UG, applying a survey supported by the proposals based on models obtained from the review such as that of Graham et al. (2001), García et al. (2015) and Bolívar and Dávila (2016).

Based on the review of the contents, a filtering of the information was carried out and a total of 12 articles published between 1987 and 2023 by various universities, researchers and research groups were chosen. It should be noted that in the works that have been published to date, there

is no coinciding orientation that integrates the distinctive elements of good teaching practices with the support of virtual classrooms, but there are models that seek to find the characteristics of an effective practice.

Regarding the bibliographic review, an analysis is made of 3 proposals that contain teaching models and research elaborated from virtual education, some based on pedagogical strategies and others that cover good teaching practices that incorporate from planning to learning assessment.(Véliz Salazar & Gutiérrez Marfileño, 2021)

Information collection instruments

Phase 2 of the research is a descriptive study that consists of an instrument which was analyzed and validated by a team of three research experts from the University of Guanajuato, includes 10 Likert-type statements and which seeks that the teacher choose elements that allow defining characteristics of teaching practices with the interaction of virtual classrooms most common to their practice. this instrument is shown in Annex 1.

The instrument was sent to a total of 20 teachers who manage virtual classrooms in the NMS of the UG, chosen through a convenience sampling since it is sought that they have mastery in the use of virtual classrooms.

4. Results and data analysis

Result of the comparative analysis: First moment

The proposals generated by the authors Graham et al. (2001), García et al. (2015) and Bolívar and Dávila (2016) are contributions that have some indicators that allow distinguishing characteristics of an effective teaching practice. The following table summarizes the proposals based on the dimensions of their teaching practice observed:

Table 2 Characteristics of various models of virtual teaching practices.

Characteristics	Garcia, Guerrero and Granados (2015)	Graham et al. (2001)	Bolívar and Dávila (2016)
Constant student-teacher communication	X	X	X
Timely information feedback	X	X	X
Flexibility in education	X	X	X
Active learning	X	X	
Promotion of cooperation		X	
Assessment instruments	X		X
Teaching materials and strategies	X		X
Interactivity	X	X	X
Platform training			X
	7	6	6

Note: This table shows some characteristics of virtual teaching practices of the aforementioned models.

The different models consider in their teaching practice that communication is a constant and essential element in the student-teacher relationship for the achievement of the teaching-learning objectives. An essential element that was manifested in most teaching models is related to promoting interactivity between the teacher and the student and students. In general, models are looking for:

- To offer students time, space, tranquility and to promote learning styles that respond to their needs.
- Provide clear information and relevant teaching resources that are references for the development of activities.
- Tracking and documenting student progress on an ongoing basis.
- Encourage interaction between students.

Result of the descriptive study: Second moment

Table 3 is shown below with the result of the application of the data collection instrument of the descriptive study, where the items of the instrument applied with the answers of the chosen teachers are shown.

Table 3 Characteristics of various models of virtual teaching practices.

No.	Questions	Always	Almost always	Sometimes	Almost never	Never	* Sum of criteria established
1	Do you encourage interaction between students with clear guidelines for good communication?	5	8	3	4		13
2	Do you encourage active learning, allowing your students to present projects and discuss their contributions among themselves?	6	9	5			15
3	Do you give feedback of information and recognition, in the activities developed on the platform with a prompt, timely and adequate response?	4	9	7			13
4	Do you assign activities regarding diverse talents and learning styles?	3	7	9	1		10
5	Does it allow students to leave topics of interest to develop academic projects?	2	9	4	5		11
6	Do you prioritize self-assessment and co-assessment among students?	4	8	6	2		12
7	Do you contemplate the flexibility of virtual environments and do not fit into a	5	10	3	2		15

	rigorous calendar that must be covered?						
8	Do you diversify the use of the platform with diverse activities and resources, presenting interesting educational materials for students?	5	6	8	1		11
9	Do you have a basic update that allows you to play the role of teacher-tutor in a virtual environment?	8	8	3	1		16
10	Do you design assessment instruments for formative and summative purposes?	6	5	8	1		11

The criteria for the interpretation of results when using the Likert scale for this research are:

- The first two answers to each question are Always and Almost Always, in this sense the criterion that is considered to have an impact is the sum of both answers for each item.

- * If the sum of the answers mentioned above is greater than 50% plus 1, that item is taken as high impact and common.

Within the parameters described above, we found that 9 items obtained above 50%, which means for this work, that they are characteristics carried out by teachers of the NMS of the UG, while the item that refers to the assignment of activities with respect to talents and learning styles, is not so common to carry out, with 50% selection.

It is important to know that one of the characteristics of teaching practices in virtual education is to be updated to perform the role of teacher or tutor in virtual classrooms, with 80% selection. Likewise, two items obtained 75%, which are the promotion of active learning and the flexibility of virtual environments. Two other important items that stand out in the study are the promotion of interaction with the student and the feedback and recognition of student activities, with 65% utilization. The remaining characteristics that also have a weighting impact according to the established criteria are to allow topics of interest to be addressed, to prioritize self-evaluation, to diversify the use of the platform and to design evaluation instruments with percentages of 55% to 60%.

5. Conclusion

In conclusion, the article analyzes teaching practices in the integration of virtual environments in the Upper Middle Level of the University of Guanajuato. The importance of encouraging interaction with students, providing effective feedback, allowing flexibility in virtual environments and designing formative and summative assessment instruments is highlighted. Teaching models based on constructivist pedagogy are identified and the need for teachers to be updated to perform their role in virtual environments is emphasized. This study provides a detailed overview of effective teaching practices in virtual education, offering guidelines for improving the quality of teaching in this context.

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