



Sustainability at UAM-Azcapotzalco for Academic Programs with Virtual Classroom Methodologies

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Abstract. The post-pandemic educational processes due to Covid-19 have generated an interest in structuring new learning trends. The Autonomous Metropolitan University (UAM) Azcapotzalco identified the use of methodologies with digital tools known as virtual classrooms during the pandemic to continue academic activities. These digital tools are still being used in different academic programs, including undergraduate and postgraduate programs to promote the professionalism of the university community. This paper provides a general breakdown of the virtual classroom format as a methodology in the teaching-learning processes to improve the educational environment at a higher level and ensure educational sustainability through the innovation of new technologies and digital tools that can be applied at a national and international level. The expected results from this methodology are part of an improvement process aimed at generating academic programs in virtual environments to enrich the educational models at higher and postgraduate levels and creating collaborative groups within each teaching department that can be extrapolated to a unit or campus level.

Keyword:

Sustainable Academic, Educational Methodology, Educational Process, Virtual Classroom.

1. Introduction

The methodologies in the teaching-learning processes in educational institutions at higher levels have been modified as part of educational and technological advances arising from the COVID-19 pandemic. This paper identifies an applicable methodology to enhance education and the teaching-learning models for the undergraduate and postgraduate academic programs at UAM Azcapotzalco by using the virtual classroom as a sustainable and supportive tool for new research in the science of education.

Institutions of Higher education are now exposed to new teaching modalities, to which they have adapted to working with virtual tools planned, designed, integrated, and

developed in education, by identifying trends in infrastructure, resources and pedagogical teaching. [1] In this regard, online or remote virtual media teaching methods face new modalities.

Furthermore, it is necessary to take the initiative to improve virtual classroom learning conditions by adopting methodologies that enable synchronous and asynchronous elements in the teaching-learning processes. [2]

2. Method

The applicable methodology for having sustainable academic programs at UAM Azcapotzalco using virtual classrooms is described according to the diagram in figure 1.



Figure 1. Virtual Classroom Methodology for having sustainable academic programs at UAM Azcapotzalco

The stages shown in Figure 1, are part of the methodology applied in the sustainability of the academic programs at UAM Azcapotzalco to improve teaching processes, using the virtual classroom tool. The following paragraphs briefly describe each stage proposed for the methodology implementation.

2.1. Digital environment

This first stage analyzes all platforms and applications that allow synchronous and asynchronous interaction with people, organizations, and university entities to facilitate communication and interaction for all activities carried out in the educational processes.

Some network programs considered for the proposed methodology include social networking platforms such as WhatsApp, Remind, LinkedIn, Skype, Telegram, Canva, and Facebook. These platforms were selected due to a wide range of advantages that includes free accessibility through different technological modes and mediums, such as linked Google accounts and mobile apps.

2.2. Platform

An analysis was carried out to select a robust and systematic (Education 4.0) platform that adheres to the conditions and requirements of the teachers, students, and educational authorities. These platforms should also permit improvements as academic periods and technological innovations elapse. The evaluated virtual learning platforms were Classroom, Moodle, Edmodo, Schoology, Blackboard, Microsoft Teams, and Sakai. These platforms allow for the creation and importation of content, optimization and diversification of resources, interaction in university communities, real-time monitoring and administrative automation

courses.

2.3. Learning format

The learning format is a document which serves as a guide in the teaching-learning units (TLU) for teachers to indicate what is being taught during the school period. It also enables digital tools for locating information for synchronous and asynchronous sessions, repository information, and general information for the students, collaborators, and competent authorities.

The aim is to provide freedom of use based on the methodological approach adopted for the academic sustainability of UAM programs. Figure 2 shows the corresponding format, as a part of the learning guide.

(UAM logo)		(Division logo)	
Virtual Classroom Learning Format (VCLF) (Name of the TLU) (TLU Initials)-Academic Period			Date:
			Elaborated by:
No.	Activity/ Description	Execution time	Place
1.	Introductory presentation for the session, 7 slides maximum	XX minutes	Classroom or virtual session through videoconference tool.
2.	Assignment of a question on a selected Educational Platform, related to what is covered in the introductory presentation.	Teacher's estimated time before class starts	Virtual, in the space provided by the student.
3.	Provide a reading of magazines with the topic to work on in class.	Teacher's estimated time before class starts	Virtual, in the space provided by the student.
4.	Elaboration of a diagram (mind map, concept map, flow, brainstorming), with respect to the information in the article.	XX minutes	Classroom or virtual session through videoconference tool.
5.	Presentation by the teacher, describing the topic in question, supported by electronic blackboard, traditional blackboard, digital tablets.	XX minutes	Classroom or virtual session through videoconference tool.
6.	Break	X minutes	-----
7.	Homework assignment that involves aspects seen in class.	Estimated time of the teacher before starting the class	Virtual, in the space provided by the student.
8.	Provide a short video, between 5 and 10 minutes, with a brief explanation of the topic covered in class, with examples and tangible applications for a better comprehension of what has been learned so students would be able to review it at their disposal for their personal study.	Teacher's estimated time before class starts	Virtual, in the space provided by the student.
9.	Elaborate and apply a form with a maximum of 15 questions in the selected Educational Platform to reinforce the learning in the corresponding session.	XX minutes	Virtual, in the space provided by the student.
10.	Post a discussion forum on the selected Educational Platform for session feedback to expose students' points of view.	Teacher's estimated time before class starts	Virtual, in the space provided by the student.
11.	Provide support material such as blogs, notes, websites, videos of their own or other teachers' authorship, as well as open-access videos on the topic or subtopics.	Teacher's estimated time before class starts	Virtual, in the space provided by the student.

Figure 2. Virtual Classroom Learning Format (VCLF)

2.4. VC Implementation

The implementation of the VC is described in the following flowchart, Figure 3.

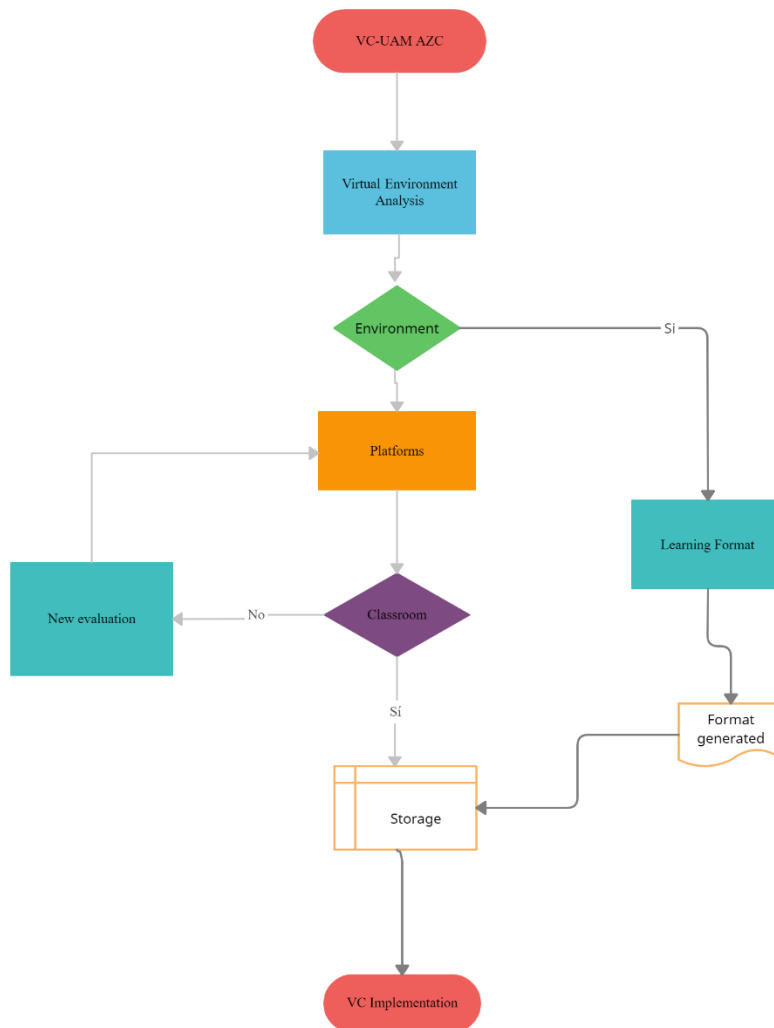


Figure 3. Flowchart for the implementation of the methodology

2.5. Evaluation of VC

The evaluation of the VC was carried out according to user satisfaction, through surveys. The results were obtained from the feedback of students that were already exposed to the methodology and teaching-learning process in each TLU. The results section will indicate statistical data obtained using the methodology of VC.

3. Results

The results were obtained using virtual environments such as Remind, Facebook, and Telegram, as these platforms helped to maintain communication between students and teachers in each TLU during the academic period (Figure 4).

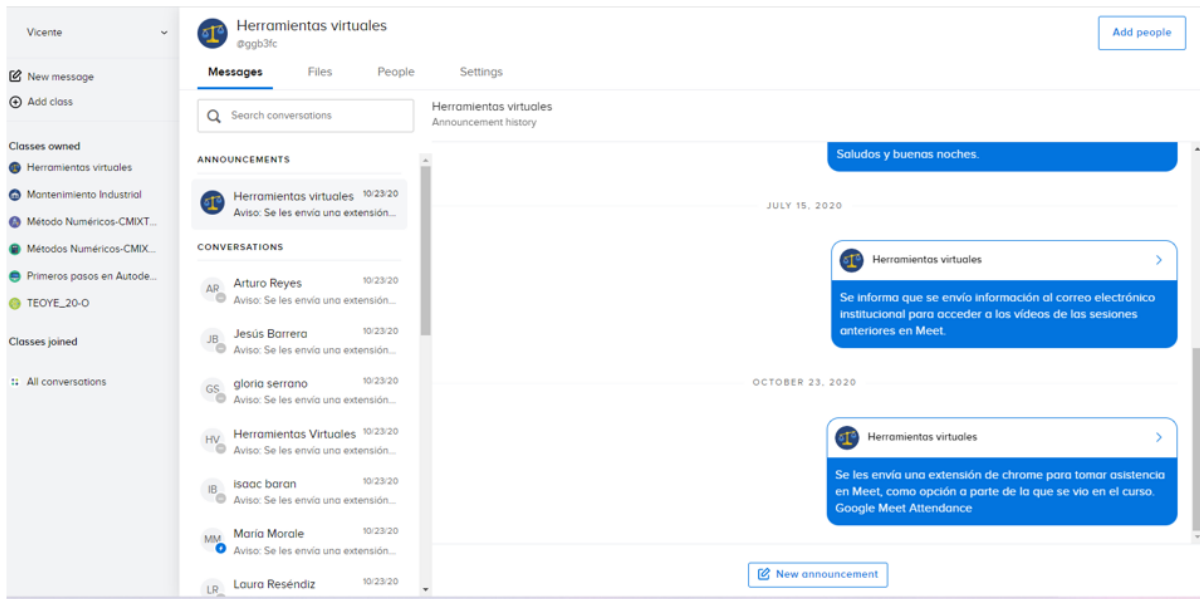


Figure 4. Evidence of the virtual communication tool “Remind” used to connect with students

In addition, the university's license for educational platforms was “Classroom”, which required users to log in using their respective institutional email. For easy accessibility, the platform was also available on the Google app, Figure 5.

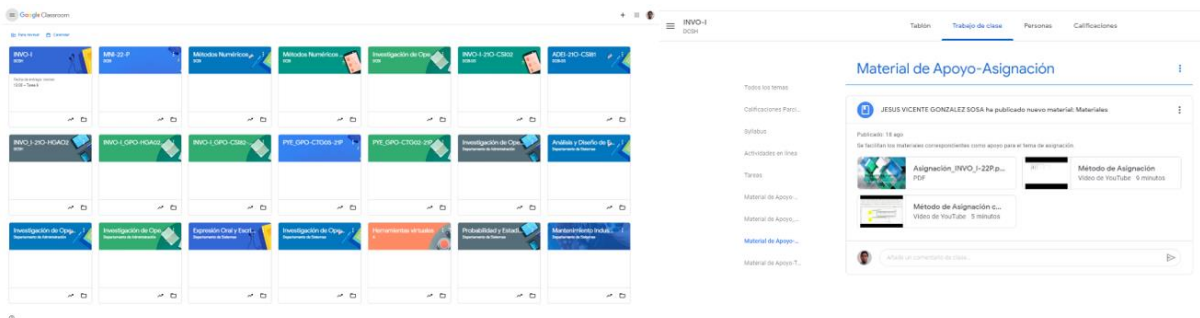


Figure 5. The educational platform “Classroom” used in VC

Students were satisfied with the teaching format, having been provided with the information in advance which helped them to manage their academic activities.

Results also revealed that the implementation stage created controversy among teachers as it pertained to placing specific material in each section of the platform.

The difference between the use of VC and the traditional process can be seen in the scatter plot graphic in Figure 6.

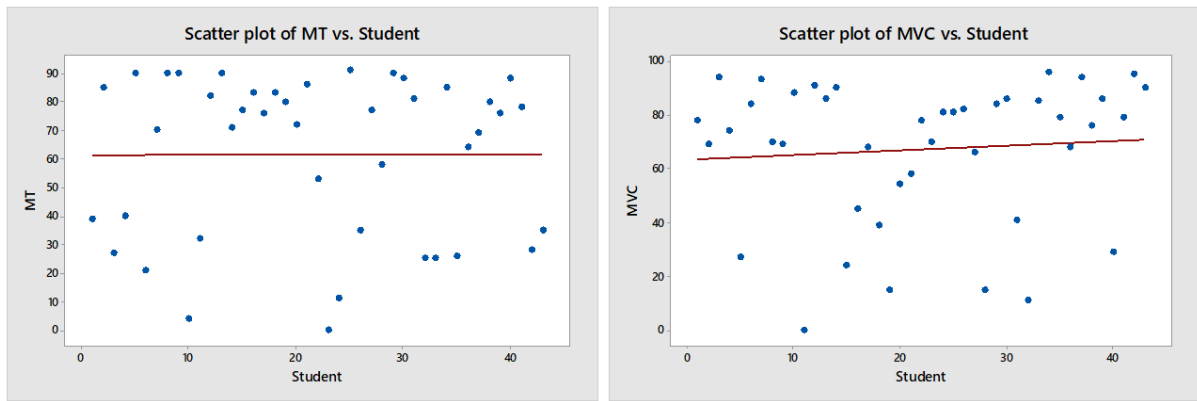


Figure 6. Graphs comparing the traditional method and VC teaching method

An improving trend is apparent in the graph on the right which corresponds to the VC methodology. However, the graph on the left side corresponds to the traditional teaching method which appeared stagnant. Together these results emphasize the need for investigating methodologies to improve teaching processes at higher educational institutions.

4. Discussion

Sustainability in higher education encompasses a wide range of social, environmental, and economic factors tailored explicitly towards their ability to adapt to changes extending beyond the classroom to meet students' needs. In this research work, a methodology was developed to initiate sustainable education through technological innovation that addressed the teaching processes at UAM Azcapotzalco. The results were satisfactory as the teaching methodologies have been applied in academic communities. As mentioned by [3], educational sustainability in universities has addressed specific problems relating to teaching-learning processes, that encourage research and development of new support tools focusing on economic, environmental, social, cultural, scientific, and productive development for countries that wish to succeed in the short term.

With the Covid-19 pandemic, the technological factors that limited the university's ability to efficiently and effectively conduct educational activities were identified. Therefore, educational institutions are more inclined to innovate inclusive, resilient, and prosperous technologies that optimize teaching-learning styles to achieve and maintain educational sustainability. [4]

Interestingly, the new teaching processes after Covid-19 have sparked interest in conducting educational and research training through VC for new challenges in ICT. Similarly, [5] agrees that educational models have been enriched with the new education standards at different academic levels.

Although technological innovations improve the education process, the emergence of new problems is unpredictable and inevitable. Hence, long-term planning is a prerequisite for comprehensively observing and understanding the trends in VC education to continue the path of sustainable education [6] Therefore, educational sustainability aims to train professionals for the challenges that may arise in the future in their professional and personal development.

5. Conclusions

The methodologies implemented by UAM to improve the teaching of academic programs using digital tools and educational platforms have so far been successful, making communication and teaching easier for students, teachers and other parties involved.

It is important to incorporate VC in academic communities to strengthen teaching-learning methodologies based on digital support.

In this paper, the virtual environment as a learning platform satisfies the basic characteristics of the institution for the development of courses which involves inputs from teacher-students-authorities. Currently, there are applications at UAM Azcapotzalco for using VC learning platforms such as Classroom and Moodle.

Through VC, the learning units have significantly impacted education sustainability. Moreover, students' responses favoured the use of VC, which increased the communication between students and teachers during academic courses.

Finally, in the event of any new challenges brought on by COVID-19, there is still a need to formulate new teaching-learning formats to improve the proposed methodologies continuously.

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