

Students' perception of their learning in hybrid modality. An exploratory study at the Veracruzana University

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Abstract – The Universidad Veracruzana has been at the forefront of significant innovations in university teaching-learning (as a result of the COVID-19 pandemic). The institution offers hybrid options to promote virtual and in-person classes. The purpose of this exploratory research is to investigate the students' perception of their teaching-learning through the use of hybrid classrooms and the role of their teachers under this model. The study was carried out with undergraduate and graduate university students from the Economic-Administrative Academic Area, from the Xalapa region, at the Universidad Veracruzana. The conclusive results are encouraging and significant, they represent a watershed to extend and value the functionality of hybridization in more academic entities, guaranteeing the Flexibility axis that is part of the UV Institutional Educational Model. According to the 5 strategies proposed, it was observed that the percentages were above 70%.

Keywords – Innovations, Educational Process, Pedagogical Mediation, Hybrid Modality, Instructional Designs, Student Perception.

Resumen – La Universidad Veracruzana, ha estado a la vanguardia en innovaciones significativas en la enseñanza-aprendizaje universitaria (a raíz de la pandemia del COVID-19). La institución ofrece opciones híbridas para el fomento de clases virtuales y presenciales. El propósito de esta investigación exploratoria es indagar la percepción de los estudiantes respecto a su enseñanza-aprendizaje mediante el uso de las aulas híbridas y del rol de sus docentes bajo este modelo. El estudio se llevó a cabo con estudiantes universitarios de licenciatura y posgrado del Área Académica Económico-Administrativa, de la región Xalapa, en la Universidad Veracruzana. Los resultados concluyentes son alentadores y significativos, representan un parteaguas para extender y valorar la funcionalidad de la hibridación en más entidades académicas, garantizando el eje de Flexibilidad que forma parte del Modelo Educativo Institucional de la UV. De acuerdo a las 5 estrategias planteadas, se observó que los porcentajes estuvieron por arriba del 70%.

Palabras clave – Innovaciones, Proceso Educativo, Mediación Pedagógica, Modalidad Híbrida, Diseños Instruccionales, Percepción de Estudiantes.

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INTRODUCTION

The education process across all academic levels has been transformed in Mexico and the world in response to the COVID-19 pandemic, transitioning to distance learning schemes, such as online, hybrid or virtual education. This new teaching model –which had to be implemented *overnight*–required adjustments in the planning, strategies and evaluation systems to favor the learning of students and without disrupting the development of the already established on-site programs and curricula.

Due to the health crisis, the Mexican Public Education Institute (*Secretaría de Educación Pública*, in Spanish), provided the guidelines and measures to take into account by higher education institutions (HEI) in the country; said document emanates the agreements from the National Council of Education Authorities (*Consejo Nacional de Autoridades Educativas, CONAEDU*), in collaboration with the Health Institute (*Secretaría de Salud*, in Spanish) against COVID-19 (SEP, 2019).

These agreements urged the faculty members to continue their teaching through digital, distance-based, and pedagogically mediated lectures. For the academic community, this implied that the reorganization of activities, virtual teaching environments, and evaluation systems, among others, were developed remotely through electronic devices to ensure the social distancing while keeping the course of higher education.

The University of Veracruz (*Universidad Veracruzana, UV*) was not excepted from these challenges, for an official statement in March 2020, addressed to the university community, determined punctual actions to follow, for both the administrative staff and faculty. In the scope of this article, we take the following guidelines

into account: suspension of on-site activities, prioritization of the EMINUS 4 platform (*Sistema de Administración of Flexible Learning Environments*, in Spanish), owned by UV, usage of external platforms such as Microsoft Teams and Zoom to keep an open communication channel between students, faculty, staff and authorities, modification of the current academic calendar to replenish the classes of the on-site session, among others (UVa, 2020).

Furthermore, in June 2022, UV resumed fully on-site activities for the 2022-2023 season, emphasizing a return to classrooms based on a full vaccination scheme applied to both students and faculty, which guaranteed immunity. Moreover, the education system was advanced from classrooms, workshops, and laboratories, along with 424 newly created hybrid rooms, available in the five university campuses, which strengthened the academic processes (UVb, 2022).

As a result of the post-pandemic, the Hybrid Classrooms Project (*Aulas Híbridas*, in Spanish) was developed in the university, consisting in the implementation of virtual, on-site, and bimodal, *i.e.* hybrid, lectures. For this purpose, an operative framework for such classrooms was proposed, conveying to “a guide for the usage of the hybrid rooms, and promoting their employment in the academic practice, fostering participation and collaboration in a rich and flexible learning environment” (UVc, 2023, p. 11).

With this new infrastructure and technological tools –a projector, remote controls, computers, televisions, audiovisual systems–, besides the usage of the remote conference channels Zoom and Teams, and the intensive use of EMINUS 4, a new stage began for the academic institution to better attend the needs of students and

professors. This contributed to the flexibility that the educative model adopted by UV since 1999 requires, enforcing an integral education of their students, and guaranteeing collaboration in an amenable learning environment in all its academic levels.

Additionally, training of faculty members was enforced, to deepen their pedagogical knowledge and technical skills, necessary for the new teaching modalities, and to benefit from professors capable of designing courses aided by Information and Communication Technologies (ICT), using interactive resources that improve the learning process of their students. The former is crucial, as professors are considered a key element for the development of these methodologies. Castaño *et al* (2017) highlight the existence of “developments associated with the faculty members’ positive attitudes towards hybrid or blended learning, are related to less barriers in their startup” (p. 5).

Hence, the main question – and objective– of this article is what the students’ experience and perception with respect to their learning and skill acquisition is, as well as their rating of the bimodal system, including hybrid classrooms and the educational process conducted by the instructors. This study is evaluated on undergraduate and graduate students from the school of business and management, in the UV campus of the city of Xalapa.

This work is formed by two parts. First, in the Development section, we expose the context of the learning process through hybrid classrooms, especially at UV, highlighting their necessary elements and

strategies. Second, we present the methodology and results of the exploratory study, applied on a sample of students. Finally, we present the conclusions and future directions of research.

DEVELOPMENT

Hybridization in the education context

It is a common misconception that the concept of hybrid modality or hybridization in the education field started from the urgent need of social isolation caused by the COVID-19 pandemic. However, this is not a novel term¹, as according to UNESCO, it has been present “in the historical core that gave birth to the distance education modality, and in cultural, sociological and anthropological studies in Latin America” (2023, p. 5). This term has been also considered as a “sociocultural process in which discrete structures and practices, that existed separately, are combined to generate new structures, objects, and practices” (García, 2000, p. 8).

In Mexico, what is known as digital and technological began to gradually be adopted in education since the decades of 1980 and 1990, when the ICT were incorporated. For instance, the introduction of computers in education institutions in the 80s and 90s, along with the emergence of the internet, allowed the utilization of both systems as a complement to on-site teaching. In 2003, SEP launched the program called Enciclomedia, installing digital blackboards and computers in basic education classrooms, allowing professors to employ multimedia resources in their teaching. In 2009, the Open and Distance University of Mexico (*Universidad Abierta y a Distancia de Mexico*, in

¹ According to UNESCO: “In the scientific literature, there is a consensus in defining it broadly as a combination of modalities

(virtual and/or in person), times (synchronous or asynchronous), and strategies aiming towards an integration of technical environments and teaching practices for the educational inclusion” (2023, p. 5).

Spanish; UnADM) is founded, a fully online higher education institution. Moreover, Google classroom and Moodle begin to be implemented, and the transition of professors' and students' roles towards a combined environment was permanently discussed (Graham, 2006).

As can be seen, the use of technology, the internet, platforms, and digital materials in the educational field have been a supportive combination for both teachers and students prior to the health emergency. However, during the lockdown and post-pandemic period, and thanks to the efforts of higher education institutions to provide the necessary technological infrastructure in their classrooms for the gradual return to university spaces, the term "hybrid" has gained significant relevance in education. It is also important to note that, according to authors such as Graham (2006), the term *blended learning*, which refers to a combination of face-to-face instruction with technology-assisted learning that facilitates self-directed learning, began to gain popularity in the early 2000s. The integration of online resources into educational programs demonstrated significant benefits, marking a milestone in formal methodology within the academic field. Thus, the concept of 'hybrid' is an approach that integrates and extends the scope of in-person teaching and learning with online activities, aiming to take advantage of the benefits of both environments. It allows students to access online content and participate in in-person classes, promoting a more flexible and personalized learning experience.

In recent years, several authors have focused their attention on studying this new approach and combinations of hybrid teaching-learning processes. For example, the need to customize training, technological resources, and pedagogical strategies (Hernández et al.,

2021). Others explore the efficiency and effectiveness of this combined environment, even claiming to have found better learning outcomes compared to the traditional method (Vallee et al., 2020), highlighting advantages such as flexibility and a more engaging learning environment compared to online or in-person courses. A relatively recent study conducted at Portuguese universities showed that students have a positive perception of the few courses offered under this hybrid modality (Pattier & Ferreira, 2023).

On the other hand, authors such as Area-Moreira et al. (2023) mention that the hybrid modality requires curricular modifications and ongoing teacher training to create diverse virtual environments that strengthen students' autonomous work, as well as defined strategies for the structure and organization of academic programs. They even suggest that educational institutions should adapt their legal mechanisms for graduation to transition from full in-person formats to semi-presential or hybrid degrees.

In the case of the UV, the hybrid modality, both inside and outside the classroom, is based on its constructivist pedagogical model, with the central focus being the learner who constructs new ideas and concepts—centered on learning. It adopts the definition of hybrid education as "the instructional method that combines face-to-face learning with online education in the teaching-learning process, providing students with the opportunity to access information in the most effective way, offering a personalized approach to their learning" (UV, n.d., para.8).

Learning strategies within the hybrid model

In the current context, blended learning requires the identification of key elements for its implementation, with the aim of improving and re-adapting it. Among these elements, which stem from pedagogical mediation—a mediated methodology to facilitate hybrid learning and emphasize students' self-reflection, goals, and achievements—are strategies for instructional design, determining the digital resources to be used, planning both in-person and remote activities (including environments, time, and space), as well as considering students' learning styles, personalities, and types².

The above highlights the need to adjust strategies and teaching modalities to the characteristics of the recipients (Vasileva-Stojanovska, Malinovski, Vasileva, Jovevski, & Trajkovik, 2015, as cited in Castaño et al., 2017, p. 4). Furthermore, it is crucial to have a specific pedagogical language that adapts to these virtual learning environments, which develops students' knowledge, skills, attitudes, and values, especially in institutions that have adopted a competency-based institutional model, such as the UV.

There are several factors that contribute to the optimal development of the educational process, which are part of pedagogical mediation³, regardless of the modality adopted by educational institutions. In the case of hybrid environments, strategies should be considered where the methodology goes beyond simply complementing in-person learning with virtual learning,

or vice versa; it is about integrating both modalities. Sangrá (2020), cited in Area-Moreira et al. (2023), indicates that the key to hybrid and flexible teaching is to understand it as a continuum, stating that "we must design both in-person and non-in-person moments as if they were a continuum... and, when appropriate, both should flow naturally" (p. 143). This means that it should not be limited to dividing content and activities—such as merely transmitting information—without a specific goal, such as providing documents, readings, and links for students to complete outside the classroom. Instead, it should offer a curricular and didactic proposal interwoven with positive and motivating actions, interactive communication mechanisms, individual and collaborative activities for constructing learning, and evaluation systems—such as rubrics—that can foster useful asynchronous debates for both students and professors. It involves recognizing the importance of "the treatment of content and forms of expression of different topics in order to make the educational act possible, within the horizon of an education conceived as participation, creativity, expressiveness, and relationality" (Gutiérrez and Prieto, 1999, cited by León, p. 141).

It is also essential to have the technical and technological infrastructure that facilitates and supports the role of the teacher-tutor, to offer positive experiences and create favorable environments for learning. Additionally, methodological aspects are crucial

² According to Ferreiro: "In this economic, social, and cultural environment, a generation is born, grows, and is educated, influenced by the increasing presence of ICT and the relationship between them: telematics, which is largely responsible for a change in the perception of reality, particularly among members of this group of people in full development, referred to as the 'Net generation' or

'Generation N,' because, of all the ICTs, the computer and the internet stand out as their emblems" (2006, p. 72).

³ Thus, "Pedagogical mediation seeks to pave the way for new relationships for the student: with materials, with the context itself, with other texts, with their learning peers, including the teacher, with themselves, and with their future" (Gutiérrez and Prieto, 1999, p. 10).

to provide an enriching learning experience in these hybrid systems.

In particular, and with the actions described in the previous paragraphs, it is also essential to consider the change in attitudes and practices that students have experienced in the process of knowledge construction as they transition from the face-to-face modality to the hybrid one. This includes the new guidelines for guiding their learning and engaging with content, the way they interact with their peers and professors, the various in-person and virtual times and spaces, and the skills and attitudes they must employ to learn.

Based on the above, and for the purposes of this research, we identify five strategies/elements that must be present in the hybrid model to clarify students' perception of their learning:

- 1) *Instructional design* that emphasizes the synchronization of in-person and online activities through the planning and organization of the course, management of interactive activities and time, accessible content, design of strategies for both in-person and virtual learning environments, and the fulfillment of the course objectives.
- 2) *Digital resources and media* designed to support the development of activities, in live events—synchronous, asynchronous—autonomous, as well as collaborative, to strengthen learning. Examples include videos, readings, podcasts, audios, graphics, discussion and debate-provoking questions, activities, practices, among others. These should be congruent and relevant to the content and learning objectives and involve the use of various technological platforms for educational purposes.
- 3) *Feedback and interaction among the participants in the educational process*, a constructive action for both in-person and online sessions, during and at the end of the course, that determines the mechanisms used by the instructor to facilitate interaction, as well as to monitor progress and performance in achieving the students' competencies (part of formative assessment). This includes aspects such as the creation of environments in which students interact with each other and with the instructor.
- 4) *Communication and motivation strategies* that establish the mechanisms for communication between the instructor and students, and vice versa, their availability to resolve doubts, their clarity in providing directions and instructions for completing and submitting activities, assessments, and the schedules set for synchronous and asynchronous sessions, among others. Furthermore, these strategies should be engaging and dynamic to keep students motivated and attentive, thereby helping them meet the challenges of their own learning in this modality.
- 5) *Assessment and learning outcomes*, which establish the type and variety of evaluation methods used by instructors to assess learning—diagnostic, formative, and summative—ensuring that these are fair and equitable. These include, for example, online assessments, collaborative and integrative projects, practical evaluations, rubrics, and so on.

METHODOLOGY

To address the objectives proposed in this research, the methodological strategy was carried out in the following phases: First, we identified the theoretical-conceptual framework to conduct a review of available bibliographic material, which led us to organize and systematize the information. Once the theoretical content was clarified, we designed and applied an instrument—a questionnaire to collect and record the information—and finally, we applied statistical techniques for frequency analysis and interpretation of the information to present the results and conclusions.

This research is exploratory in nature, combining both qualitative and quantitative approaches. Therefore, the results are not representative but rather significant. The population selection is intentional: active undergraduate and graduate students from the economic-administrative academic area of the Xalapa region at the UV, during the academic period from February to July 2024.

The perceptions of 32 students were analyzed through a questionnaire administered on the Google Forms platform to explore students' perceptions/experiences in their hybrid courses. The items and dimensions explored for the evaluative analysis are as follows: 1) Instructional design, 2) Use of digital resources and media, 3) Feedback and interaction, 4) Communication and motivation, and 5) Assessment of learning outcomes.

RESULTS

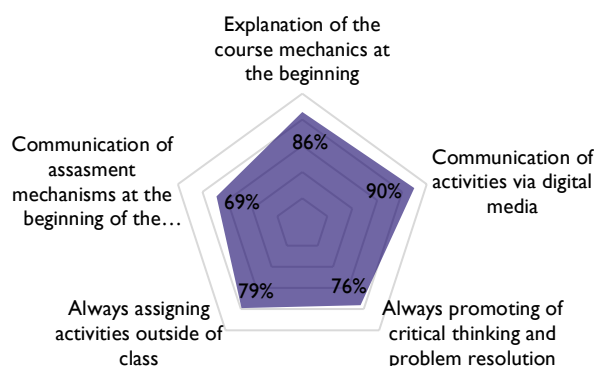
Of the students interviewed, 9% reported not having any educational experience in the hybrid modality and therefore were excluded from the study. The sample composition shows that 38% of the interviewed students are women. Among them, 10% are undergraduate students, 38% are in specialized studies, 45% are pursuing a master's degree, and 7% are doctoral students. Furthermore, 57% of the participants are between the ages of 23 and 25, while 31% are over 30 years old.

Regarding instructional design, 28% of the student's state that their instructor allocates less than 25% of the course to the hybrid modality. 45% report that the instructor allocates between 25% and 50%, while the remaining 27% indicate that the instructor dedicates between 50% and 75% of the course to the modality.

For the other variables related to instructional design, it can be observed in Figure 1 that most of the communication regarding activities from the instructor is through electronic means (90%), and most instructors present the course work mechanics at the beginning of the course (86%), with the remaining 14% doing so during the course. 79% state that the instructor assigns tasks outside of class, while the remaining 24% mention that this only happens occasionally. 76% perceive that the instructor always promotes participation and the development of critical thinking for problem-solving, while 21% believe it happens only sometimes and 3% say it never occurs. To conclude this section, 69% of the students report that instructors communicate the assessment methods at the beginning of the course, 27% at the start of the activity, and 4% say it is never communicated.

Figure 1

Questions and response percentages about instructional design.



As shown in Figure 6, in terms of average, instructional education is around 80%, with the communication of the instructor through electronic means standing out as a successful variable, and the communication regarding assessment methods at the beginning of the course identified as an area of opportunity for improvement.

Regarding section 2, the use of resources and digital media, Figure 2 shows an important area of opportunity both in the instructor's technological skills and in the recommendation of digital materials to support activities. 93% of students considered the strategies used by the instructor in the hybrid modality to be very effective, 3.5% considered them somewhat effective, and the remaining 3.5% considered them ineffective. 83% state that the instructor uses in-person lectures along with at least one digital medium (virtual forums, videos, podcasts, links, Teams, EMINUS, email, etc.), while 7% report that the instructor does not use digital media in the hybrid modality.

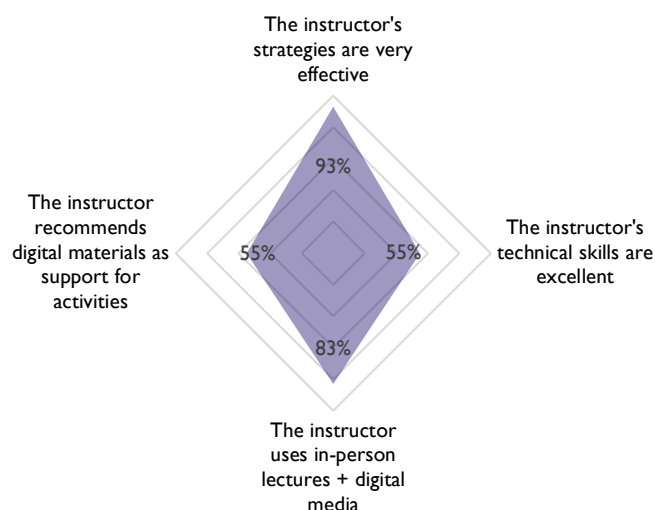
It is noteworthy that 55% of students stated that the instructor's technological skills in the hybrid modality are excellent, 41% considered them acceptable, and 4%

considered them insufficient. Regarding the recommendation of digital materials to support activities, 55% reported that the instructor recommended at least one digital resource (links, videos, tutorials, or specialized website materials), 41% recommended physical materials (complementary bibliography, examples, and counterexamples), and 4% stated that the instructor did not recommend any support materials (see Figure 2).

On average, the use of resources and digital media is around 72% (see Figure 6).

Figure 2

Questions and response percentages about the employment of digital media and resources.



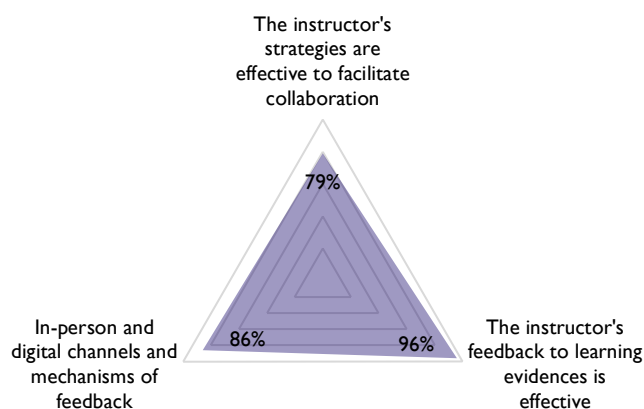
Regarding section 3, feedback and interaction among the participants in the educational process, the results are shown in Figure 3. As observed, 96% of the interviewees perceive the feedback provided by the instructor on their learning evidence in the hybrid modality as effective, while the remaining 4% state that the instructor gave no feedback. In terms of feedback methods and mechanisms, most instructors use both in-person and digital means (86%), 6% report that feedback

was provided only through digital means, and 4% did not receive any feedback.

On average, feedback and interaction are at 87% (see Figure 6).

Figure 3

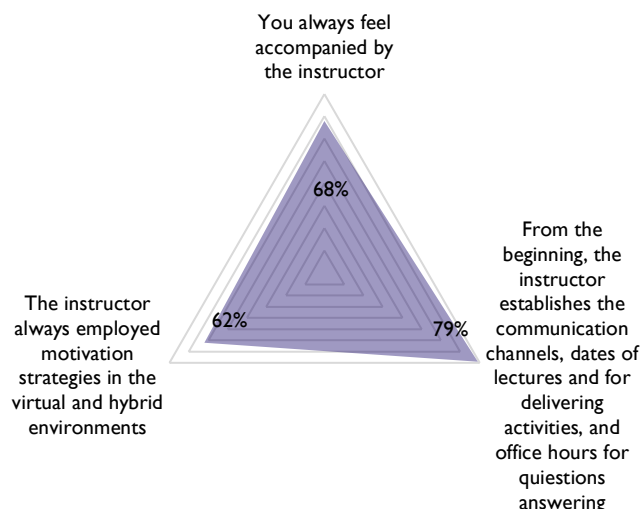
Questions and response percentages about feedback and interaction among the participants in the educational process.



Regarding section 4, communication and motivation strategies, as shown in Figure 4, 79% of students report that the instructor always establishes communication channels, important dates, and a schedule for addressing doubts from the start of the course, while 21% state that this only happened occasionally. In terms of feeling consistently supported by the instructor, an area of opportunity is evident, as only 68% feel consistently accompanied, while the remaining 32% feel supported only occasionally. Regarding motivation strategies used by the instructor in virtual or hybrid learning environments, another area of opportunity emerges, as only 62% of students report that the instructor consistently worked to keep them motivated, while 34% state that motivation strategies were used occasionally, and 4% express that these motivational tactics were never employed.

Figure 4

Questions and response percentages about communication and motivation strategies.



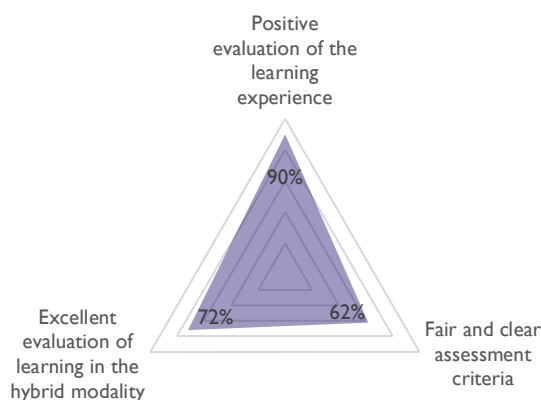
On average, communication and motivation strategies are around 70%, which is the lowest average among the five sections analyzed (see Figure 6).

Regarding evaluation and learning outcomes, it can be observed at a general level in Figure 5 that 90% of students evaluate their learning experience positively. Specifically, in the evaluation of learning in the hybrid modality, 72% of students express that this modality is excellent, 20% rate it as average, and 8% consider it a modality that can be improved. The area of opportunity identified is in the evaluation criteria, as only 62% believe that the evaluation criteria were clear and fair, 34% consider them acceptable, and 4% believe that the criteria were neither clear nor fair.

The most common forms of evaluation (it should be noted that each of these is accompanied by other forms of evaluation, so the total does not add up to 100%) are projects and final assignments, whether individual or group-based (86%), midterm or final exams (62%), rubrics (62%), checklists (31%), and questionnaires (31%). It is noteworthy that 13% report having used self-assessment tools as part of the evaluation methods in the hybrid format.

Figure 5

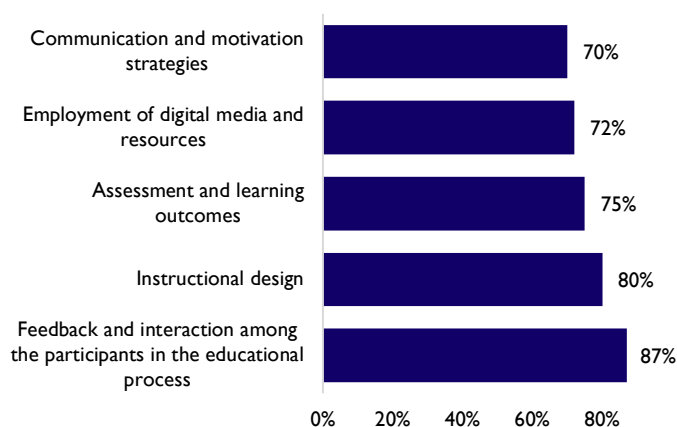
Questions and response percentages about assessment and learning outcomes.



On average, evaluation and learning outcomes present a score of 75% (see Figure 6).

Figure 6

Average values per section.



In conclusion, it can be observed that students perceive the hybrid modality as particularly strong in terms of feedback and interaction among the participants in the educational process (87% on average) and instructional design (80% on average). However, the evaluation of learning outcomes, the use of resources and digital media, and the communication and motivation strategies employed by instructors are areas that require reinforcement (see Figure 6).

CONCLUSIONS

Currently, the Universidad Veracruzana promotes a variety of learning environments where in-person sessions, workshops, laboratories, online courses, and hybrid and flipped classes are conducted. Each of these spaces stimulates learning in students by using a variety of media and resources, primarily focusing on interaction between students and their instructors. In these environments, thematic content, teaching and learning strategies, and educational resources are implemented, supported by the physical and digital institutional infrastructure (UVd, n.d.), in line with current policies. Specifically, this approach is aimed at achieving positive outcomes in the teaching and learning process using hybrid classrooms within university spaces. Based on the results obtained in this study, we are aware that while benefits have been achieved, there are also challenges that the university and its members must face to fulfill the mission and vision of the Universidad Veracruzana.

Undoubtedly, the results of this study are encouraging and significant, as they represent a turning point in extending and assessing the functionality of hybridization in learning environments. This approach can ensure the flexibility that is part of one of the key

pillars of the Universidad Veracruzana's Educational Model, thus contributing to the performance and comprehensive development of students. It is noteworthy that 96% of students report receiving feedback from instructors in the hybrid modality, and 90% maintained communication through electronic means. However, this also presents several challenges: not all students have the means and resources to access technology appropriate for their learning, creating learning gaps (as experienced during the COVID-19 pandemic). To address this, it is essential to design and implement strategies that foster interaction and collaboration among students who are in different and distant spaces. On the other hand, there is the challenge of ensuring sufficient and accessible technological infrastructure at the university for all students, both on-site and remote. This includes reliable internet connections, as well as devices and platforms that meet the teaching and learning needs of the students.

On the other hand, we believe that the training and updating of faculty in digital and hybrid pedagogical knowledge and competencies is an important area of opportunity. This would allow for the expansion of educational experiences within the curricula of academic units, taking advantage of the effort and investment made by the university itself. This could potentially impact the increase in student enrollment, extending the university's presence to areas beyond its established regions. To achieve this, proper organization of resources is essential to offer courses, diplomas, and training programs in the use of technology, pedagogical approaches, and disciplinary knowledge required to meet this challenge effectively.

Additionally, there are opportunities to create virtual environments or spaces that are designed and

developed for independent and autonomous student work, enabling them to develop and integrate into the workforce with the competencies that today's social context demands. In this regard, areas for improvement have been identified in the technological skills of faculty (55% of students rated them as excellent), the use of digital materials to support activities (55% reported receiving such support), as well as in the motivation provided by instructors in these environments (62% stated they felt supported), and in the clarity and fairness of the evaluation criteria (62% mentioned their evaluations were clear and fair). These are challenges that need to be addressed by designing and implementing continuous evaluation strategies, providing regular feedback to students to enhance their learning. Furthermore, it is important to promote active participation and engagement from students in this modality, highlighting that these new learning environments should be seen as valuable tools to foster responsibility for their own learning.

Finally, we observed that 75% of the interviewed students, from both undergraduate and graduate levels in the Economic-Administrative Academic Area in the Xalapa region, expressed satisfaction with the learning generated. We believe that, like any process of educational innovation and management, it requires systematization and evaluation to adjust, modify, and/or adapt methodologies and strategies to ensure an equitable digital culture and maximize the human infrastructure and technological equipment available to the educational institution. This will require changes in both the management policies of the authorities and the role of the instructors, without losing sight of the fact that the student must remain at the center of the educational process. While these results were

satisfactory, we are also aware of the challenges presented in adapting content, methodologies, and strategies that are suitable for this type of format, which requires time and effort from the instructors, in addition to their regular academic duties.

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