

Experienced skills in the alternative towards a blended or hybrid model: the case tested in the economic and administrative sciences

Aptitudes experimentadas en la alternativa hacia un modelo semipresencial o híbrido: el caso probado en las ciencias económico, administrativas

IRETA-LÓPEZ, Hugo†*, GONZÁLEZ-LÓPEZ, Olga Yeri, BERTTOLINI-DÍAZ, Gilda María and PÉREZ-CANO, Marina

ID 1st Author: *Hugo, Ireta-López* / ORC ID: 0000-0002-2312-6429, Researcher ID Thomson: S-8676-2018, CVU CONACYT ID: 947616

ID 1st Co-author: *Olga Yeri, González-López* / ORC ID: 0000-0002-4157-8840, Researcher ID Thomson: T-1683-2018, CVU CONACYT ID: 336574

ID 2nd Co-author: *Gilda María, Berttolini-Díaz* / ORC ID: 0000-0001-5889-4420, Researcher ID Thomson: 1435-2017, CVU CONACYT ID: 670973

ID 3rd Co-author: *Marina, Pérez-Cano* / ORC ID: 0000-0003-0181-3962, Researcher ID Thomson: D-6457-2018, CVU CONACYT ID: 544704

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Abstract

The elements that we knew in the Universities in which large groups of students were summoned ceased to be operable. The systems based on face-to-face and distance education were strongly ascending but at a slow pace. The present study had the purpose of recognizing the context, scenarios and challenges experienced after the pandemic confinement that give way to the consideration of moving from the traditional classroom to hybrid education. For this purpose, a non-experimental, exploratory, descriptive and quantitative research was carried out under a conceptual, theoretical and observational methodology, which allowed the application of an instrument with validity and reliability that measured, according to the criterion of perception. The results show the achievements expressed by the students, where they highlighted the degree of contribution of the didactic strategies, as well as the contribution to the comprehension, analysis and debate, emphasizing the collaborative conception and that an adequate personalized feedback was provided by the teacher. The great challenges to be faced in relation to the implementation of a hybrid classroom model, let's consider transforming an educational model into a hybrid one that allows to effectively harmonize both face-to-face and distance students, with the support of online materials and resources. Considering the factor of opportunity and equity towards students, finally the latent threat of insufficient resources that generates uncertainty for proper academic planning.

Live events, Autonomous and self-located learning, Collaboration, H-Index, Citation as science

Resumen

Los universos que conocimos en las Universidades, en el que se convocaban a nutridos grupos de estudiantes, dejó de ser practicable. Los sistemas basados en la presencialidad y la Educación a Distancia ascendían fuertemente pero a una cadencia lenta. Por lo que el presente estudio tuvo como propósito reconocer contextos, escenarios y de aquellos retos experimentados después del confinamiento pandémico que dan paso a la consideración de transitar del aula tradicional a la educación híbrida. Para lo cual, se realizó una investigación de tipo no experimental, exploratoria, descriptiva y cuantitativa, bajo una metodología conceptual, teórica y observacional, lo que permitió llevar a cabo la aplicación de un instrumento con validez y confiabilidad que midió, según el criterio de percepción. En los resultados se señalan y comprueban los logros manifestados por los estudiantes, en donde destacaron el grado de aportación de las estrategias didácticas, así como a la contribución a la comprensión, análisis y al debate, destacando la concepción colaborativa y de que se proporcionó una adecuada retroalimentación personalizada por el docente. Los grandes desafíos a enfrentar en correlación hacia la implementación de un modelo de aula híbrida, es que se debe considerar el transformar un modelo educativo hacia uno de forma híbrida que permita armonizar eficazmente tanto en los alumnos de manera presencial como los que se encuentren a distancia, con apoyos de materiales y recursos online. Considerándose el factor de oportunidad y de equidad hacia los estudiantes, finalmente la amenaza latente de los recursos insuficientes que genera incertidumbre para una correcta planeación académica.

Eventos vivos, Aprendizaje autónomo y autoubicado, Colaboración, Índice h, Citación como ciencia

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* Correspondence of the Author (Email: hugo.ireta@ujat.mx)

† Researcher contributing as first author.

Introduction

Background

As of March 2020, COVID -19 experienced the closure of face-to-face classrooms in universities to make way for virtual teaching, which caused both students and teachers to transition to new forms of learning and interaction.

What was experienced among the effects of contamination, loneliness, the loss of family members, the scarce resources to face the new challenges of the new reality and to take the educational training to the higher level, as elements contributing to the teaching and learning with meaning, where in the voice of the students, their perception referred to the absence of these elements in the virtual classroom, however, the purpose of continuing with the academic training of the university students was carried out. In February 2022, the authorities decided to reincorporate face-to-face activities in a staggered manner and considering the recommendations of the health authorities towards a healthy distance from the classroom.

Reference framework

According to their research by (Horn, M; Staker, H, 2011) and (Grushka; Cockayne, 2020) we can talk about the combination of media delivery modalities, the combination of didactic methods, or the combination of face-to-face and online instruction. From these combinations, students can be organised in groups, either in rotation or in flexible mode.

Rotation	Flexible
Students rotate between learning modalities.	Online learning is the backbone of the training process.
Rotation may follow a fixed sequence, at the teacher's discretion, where one modality is online learning.	Online directs students to perform offline activities.
Other modalities may include small group activities (classroom, individual tutorials, or pen and paper assignments).	Students switch modes in a personalised way, following the parameters set by the educational institution.

Table 1 Combination of modalities

Note: Interpreting as testimony to (Horn, M; Staker, H, 2011) and (Grushka; Cockayne, 2020) "we can speak of mode blending, where students rotate modes and learning focuses on flexibility"

A hybrid education environment or a "reformed web" is described by combining face-to-face methods with computer-mediated instruction, where the use of networked ICT, real or deferred period, specifies the model. This method seeks to take advantage of both virtual learning enhancements and the interaction and associations generated by groups in face-to-face sessions (ELd, 2012).

For The City University of New York (CUNY, 2022) a class is hybrid when between 33% and 67% of instruction occurs online. It further distinguishes hybrid learning from synchronous and asynchronous online sessions. In this sense, each educational institution sets the parameters according to the training or educational needs, and to the "physical layer", i.e. the technological means it possesses to provide the educational service.

Face-to-face and online	Synchronous	Asynchronous	Traditional classroom	Inverted classroom
This organisation is relevant for making decisions regarding the formation of: 1) Working groups. 2) Project groups. 3) Small rooms. 4) Discussion groups. Among other types of interaction.	Activities are planned such as: - Surveys - Discussions - Discussions - Small rooms	It is planned and build smaller material: Videos Tasks Forums Articles (5-7 minutes)	Preferred for the development of theoretical content, guided by the teacher.	Theoretical learning by discovery is promoted and what has already been explored in class is discussed.

Table 2 Characteristics that apply to hybrid learning

Note: As depicted in the table, blended learning incorporates traditional instruction into multimedia forms of teaching based on ICT resources. As stated by (Bustos, Farias, E.; Escalante, Huitron, V.D, 2017. pp.79-83) hybrid learning allows adapting to the current technological reality and understands new technologies as useful resources to facilitate learning

Concepts

Hybrid Classroom. Hybrid education is a teaching method based on educational technologies linked to the Internet. In this type of education, both teachers and learners benefit from blended learning (synchronous, asynchronous, non face-to-face) which allows reaching anyone with access to the internet. In a hybrid classroom some learners are present (Bhagat kk, 2012).

Evaluation of virtual environments. It should centrally include the analysis of the quality of study materials, and teaching performance in terms of communication and interaction, as well as the quality of the technological environment (Cabero, 2009).

Digital educational technology. It is a set of resources, processes and tools of Information and Communication applied to the structure and activities of the education system in its various scopes and levels (Adell, 2018, pp.116-128).

Virtual interaction. It is the application of methods to develop systems that are augmented in numbers or data and that allow to automate certain processes (Anderson, 2003, pp.129-144).

Regulatory framework

The contingency forced to restructure the way of imparting knowledge to students, implementing digital strategies that helped to preserve the education of students.

Therefore, the UJAT issued its Plan of Return to the New Normality, in accordance with the different norms and guidelines issued by the World Health Organisation, at the national level and by the different federal organisms such as the Ministry of Health, Ministry of Education, Ministry of Labour and Social Welfare and the National System of Civil Protection.

Justification

In this article, as a justification, the starting point was the review of the evidences experienced in relation to the hypothesis proposed; trying to understand more deeply the effect of moving from a traditional teaching, classroom, university and focused on the practice of the teacher towards a virtual interactive classroom, in order to contribute to a meaningful learning and inclusive interaction for the benefit of the university community.

Problem statement

The face-to-face classroom in Higher Education Institutions (HEI) has been a space where university students have been professionally trained and where, through interaction with teachers, they have contributed to their binding experience. However, the COVID-19 pandemic aspects radically forced the tactics of teaching and interaction, adapting an institutional model of virtual classes, different from the traditional face-to-face model that had been used for decades.

This measure, taken by the university authorities, was seen as a temporary measure, but with the passing of time (2020-2021) it was rectified as the only option for academic training. The lack of contact and interaction experienced by both students and teachers was both physically and emotionally draining. With the return to university activities, the following questions can be asked:

What are the implications of a staggered and healthy distance return to face-to-face classes?

Are there adequate infrastructure and conditions for the return of students and teachers?

Are the infrastructural conditions for migrating to the hybrid model adequate and sufficient?

Is hybrid education presented as an ideal pedagogical alternative to the traditional model of university education, contributing to the process of transformation and closing inequality gaps?

Should teachers be accompanied and trained to enter the new educational model, developing competences for hybrid learning?

The aspects that were addressed and that affect the return to the classroom were generally located on the return to the classroom. However, due to the circumstances of the challenge of facing the immediate return, there was inadequate planning in the distribution of timetables and the combination of subjects that would be taken online, thus causing confusion and challenges for both students and teachers in order to be on time and in good form.

In relation to the situation of those students who had to move to their respective homes to connect to the class via the platform; adding that the university campus was the site of a vaccination centre and that the main avenue is in the process of construction of a road axis, factors that complicated the return in both face-to-face and distance modalities. If we consider that the pandemic impact on federal funding of HEIs will be difficult to estimate, with the little information available (Mendoza, Rojas, 2020, pp.92-102). This author mentions in his research that in terms of federal funding in the first two decades of the 21st century, the following periods can be established.

Period	Phases of budget growth for HEIs
2000-2015	Federal budget growth in the first half of the Peña Nieto government (2012-2015).
2015-2018	Oil crisis and budget adjustments.
2019-2020	Budget in the first biennium of López Obrador's government. Measures in the face of the coronavirus pandemic (April 2020).

Table 3 Phases of HEI budget growth

Note: It can be seen in the table that from 2015 onwards, budget adjustments for higher education have been registered and expressed. Adapted according to the reading of (idem Mendoza), however, the author indicates in his study that in the six-year PAN administrations of Vicente Fox and Felipe Calderón, the federal budget allocated to higher education was increasing in almost all years (only in 2006 did it decrease).

The National Association of Universities and Higher Education Institutions (ANUIES, 2020) has been concerned about the systemic deterioration of public universities due to the budget crisis, which for decades have seen a reduction in public funding, through a virtual meeting with the 35 rectors, deputies of the Oversight and Education Commissions, and with the participation of the Federal Superior Audit Office at the end of 2020.

Based on the above and in order to comply with the return to classes with the best opportunity, it was considered as an alternative in the subject of human management support processes, implementing experimentally the mixed model (face-to-face and virtual), which caused a challenge for both authorities, teachers and students, forcing the rethinking of immediate operational strategies between teachers, students and compliance by the divisional authorities, giving pause to the little existing infrastructure and the availability of students and teachers to implement hybrid classrooms on an experimental basis. In spite of the efforts made at institutional, teacher and student level to move to a hybrid scheme and how to address competences in evaluative terms, the following challenges emerged:

Main situation	It represents the distribution of the academic loads to the teachers and is framed mostly towards the students because at the end of their face-to-face classes they had to fulfil those programmed through the platform.
	The insufficient technological and adaptive infrastructure in the classrooms was evident.
Migrating from face-to-face and analogue to the virtual platform	
At the Operational Level	Intensive use of technology was required, and deficiencies were detected in some students' homes, the limited availability of hybrid classrooms and a certain willingness of teachers to experiment with this modality in university teaching, which became a risk to the challenge of adaptability. Likewise, with regard to re-entry enrolment and the investment required in technological infrastructure, which was not considered in the budget, it is worth noting that the following aspects were taken into account
Ensuring security	Towards the university community and safeguarding academic quality.

Table 4 Risks identified

Note: As detailed in the table, the four risks faced by students and teachers are listed. Own elaboration based on the exit interview (June 2022). Scientists have identified different sets of variables to be assessed in e-learning: socio-economic context, learning environment, technology, pedagogy and learners (Hughes, D Adriaanse; Barnes, S.A., 2016)

Objectives

General

To identify the degree of contribution to the empirical transmission of knowledge that influenced university students in their return to classes from a double perspective of the face-to-face and distance classroom. Classroom and distance learning perspective.

Specific

- To find out the aspects related to the achievement of integration, adaptability and correlation when working under this modality with students in their learning process and accreditation of the subject.
- To examine the aspects of students' performance in both face-to-face and virtual forms related to the degree of contribution experienced in carrying out their school activities.
- To explore the degree of contribution of the digital technologies provided towards the skills and abilities of the tools in the educational contexts.

Methodological design

Type of study

We proceeded to carry out an observational, analytical, cross-sectional study and the application of an exit interview during the staggered face-to-face return corresponding to the first school year (February-June 2022), in the Academic Division of Economic and Administrative Sciences of the UJAT, which has the careers of Administration, Public Accounting, Economics and Marketing. Recalling that the teaching-learning process during the last two years 2020-2021 was through the virtual classroom. The study was proposed by the Academic Body of Globalisation of Higher Education and Public Policy.

Population

The population subject to the study were 42 students that due to circumstances of schedules and transfer did not allow them to get to their homes to take their virtual class, so with the support of divisional authorities, the group was integrated in a hybrid experimental form of the subject Processes of support to Human Management of the degree in administration.

Exit survey

The survey was applied at the end of the school year (February-June 2022) and with those who decided to participate voluntarily, registering 40 participants, which represented 84 % of the population under study. Those who returned the questionnaires, 8 students, 16%, were not included in the final analysis. It should be noted that 58% of the participants were female and 42% were male. It should be noted that more and more women are enrolled in higher education.

Instrument

An anonymous and self-administered survey was applied, previously elaborated and validated, using the Google Forms platform to create the questionnaire online, which saved time and at the same time made it possible to obtain the results in tabulated form.

Variable	Description	Measurement/Dimensions
Teaching experience and contribution.	To identify the degree of contribution to the transmission of knowledge to the students.	Process used. Results. Intervention.
Achievements obtained by students.	To know the achievement of integration and correlation when working in this modality.	Adaptability. Initiative. Productivity. Collaboration. Responsibility.
Experiences gained from working in groups.	Integrated effort of a group of people to carry out school activities.	Performance in the virtual context. Individual performance.
Learning and linking digital activities.	To examine the degree of contribution of digital technologies to educational contexts.	Capacities and skills in digital tools.

Table 5 Definition of variables

The instruments were validated using the expert judgement technique, where experts gave their opinions and experiences in the approval process. With regard to the experience gained in the last session, these experts participated as part of the exit evaluation.

Results

The most significant achievement of the experiment is to have demonstrated that by implementing a hybrid classroom, from the deductions obtained, it was possible to evaluate the activities in a comprehensive way on what was experienced during the development of teaching and learning, in addition to the fact that satisfactory percentages were provided from the students' own experience. Likewise, it was possible to verify the experiences lived within the classroom sessions, both in virtual and face-to-face mode.

It was demonstrated that there are several advantages to using the hybrid classroom, for those cases that occur due to the overlapping of timetables and that due to certain circumstances must be mixed in face-to-face and virtual form.

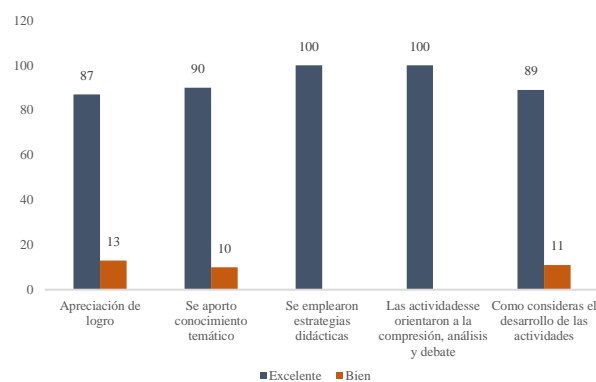
The results obtained lead to the reflection that new approaches should be considered to be verified in terms of the applicability of a study with a macro sense in the context of the DACEA, focused on the strategic considerations of hybrid classroom management, under the approach of equity and opportunity for students and in support of contributing to their needs to be able to pursue higher education in equal circumstances.

With the deductions achieved, we can be in the condition to affirm that the experiment obtained fundamental data and with support for further studies for the UJAT, so that the questions and objectives set out to verify the degree of contribution to the transmission of knowledge in both the classroom and the virtual classroom are fulfilled.

About	In expressed opinion	Percentage (%)
Achievements.	On didactic strategies employed.	100
	Towards guidance, understanding, analysis and discussion.	100
Collaborative design.	Towards teacher feedback.	100
	Provided personalised attention which contributed to learning.	100
Knowledge acquired.	To the measurement of acquired knowledge and digital involvement.	90
	Acquisition of experiences.	85
The contribution of the purposes to the formative.	Excellent support from the Academic Division.	90
	Technical failures of the platform, sound and internet were detected.	30
The contribution of the teacher.	Applied assessment strategies and instruments.	90
	Used formative assessment.	89

Table 6 Synthesis of the main findings detected

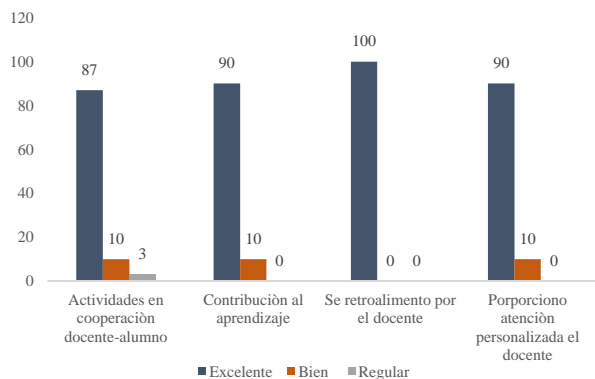
Note: As represented on the findings experienced and detected as main findings, the actions on didactic strategies, guidance, analysis and debate aimed at formative evaluation stand out. According to (Coll, 2018), it is confirmed that "this alignment between what is done inside and outside the school contributes to reinforcing the meaning and personal value that students attribute to school learning and represents an important step towards the personalisation of school learning"



Graphic 1 Contribution to formative assessment

What is the appreciation of the achievement obtained?

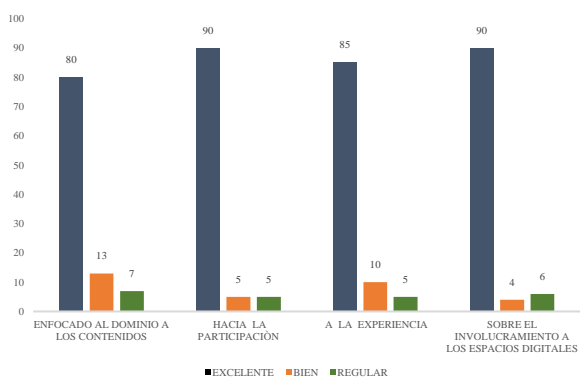
Note: As can be seen in the figure, there is a unanimous manifestation towards a good contribution to the formative assessment of students with positive results. (Murillo, F.J; Hidalgo, N., 2015. pp.43-61) specify the differences of assessments in support of instructional decisions, distinguishing formative and summative purposes.



Graphic 2 Approach to cooperative and collaborative learning

Did I contribute to collaborative cooperation?

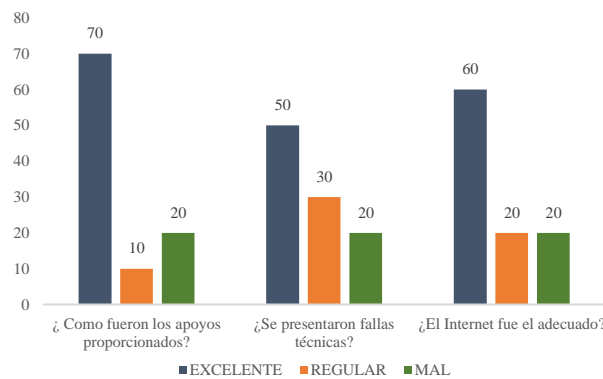
Note: In this sense, it is interesting to see how the majority of the students express themselves about the activities they developed in a collaborative way and focused on providing feedback for learning. Orihuela (2010) defines social networks as "web-based services that allow users to interact, share information, coordinate actions and, in general, keep in touch".



Graphic 3 Summative assessment orientation

Was the knowledge acquired assessed?

Note: As we can see from the data obtained in the figure, the participants, both face-to-face and distance, highlight the fact that the evaluation process applied contributed to reflection, allowing the measurement of content and reflection. (Ruz Herrera, 2018) states that evaluation and its function in the curriculum is a tool that favours the teaching-learning process towards the contribution of significant and quality learning towards reasoning.

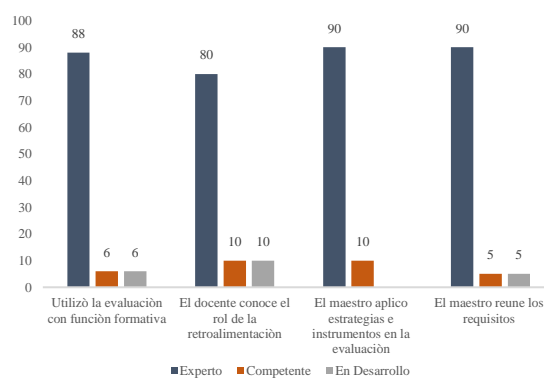


Graphic 4

Technical support considerations

Did they contribute to your learning needs and purposes?

Note: As can be seen in the figure, the disposition of the authorities was acceptable in spite of the challenges that were faced. For (Servin, 2020) this type of education should be understood as a combination of didactic tools and resources of the face-to-face and virtual modality.



Graphic 5 Teacher evaluation

How do you consider the teaching development and support was?

The key findings of the exit interview are summarised as follows:

In general.	Student satisfaction with the experience of the hybrid model was reported at 80%. They reported a 20% dissatisfaction with the technical and internet resources on campus.
Hybrid mode	With a mixture of face-to-face and virtual classes, 87% were satisfied.
Face-to-face students	Attendees in the face-to-face classroom reported 92% satisfaction.
Reasons why students value being in face-to-face mode	It's the conviviality with friends. Doubts are clarified in a much more direct way. You experience working in teams and academic events.

<p>On their experience of the virtual classroom through COVID-19</p>	<p>During the period of confinement, our academic and personal development was affected by the lowering of our self-esteem and the development of our training.</p>
<p>From the experts participating in the closing activities</p>	<p>The good experience in the hybrid classroom modality was noted. It is necessary to take into account a training programme for teachers to move from the traditional to the new requirements with virtual support.</p>

Table 7 Exit interview Exit interview (Hernández, Sampieri, Roberto; Cols, 2013) who state that the interview is an effective and highly accurate instrument, since it is based on human research, although it has a problem of delimitation due to its widespread use in various areas of knowledge.

Unanimously, the students were unanimous that having or not having face-to-face classes was the most influential factor in their satisfaction. The online learning experience has greatly influenced our life as students and therefore the experience we had with the hybrid classroom. The students surveyed ask the authorities to provide places to interact and socialise safely.

Discussion

Based on the experience, the following advantages can be listed: personalised training and attention, flexibility, time saving for the students in order to be able to attend scheduled classes online either in the flipped classroom or remotely. With regard to the challenges for this to work, it is necessary to reduce the digital divide among students, not only in terms of access to institutionally provided tools such as computers and broadband, etc., but also in terms of improving the quality of teaching and learning. But also in the improvement of the digital dimensions for which to move both students and teachers in this digital world, so it is necessary the development of digital competences that they must have.

Therefore, the teaching staff has to be trained to be able to deliver online and face-to-face training, as well as to know how to combine the requirements of testing learning in a practical and applicable way, which contributes to the meaningfulness and applicability of learning.

Conclusion

From the experience of the pandemic in higher education institutions, it has been possible to identify very clearly the limitations of face-to-face classes, as well as the restrictions of distance education in its dominant forms.

Face-to-face education, organised in classrooms and with professors in charge, under a regulatory and monitoring system, has been a great advance at the time, supported by a system of tutorials, and unquestionably involves an advance in the democratisation of teaching and in its efficiency. It is worth mentioning that the professionalisation of teaching and educational management was a sign of the demands for quality in the experimental form of this educational model.

However, today teachers and university authorities must face the context of new paradigms in higher education and the undeniable advance of technologies applicable to higher education.

The result obtained experimentally, it could be proved that this educational strategy is supported towards a much more personalised and flexible training than the usual method, which involves much more motivated students and, therefore, with optimal academic results.

Now we can say that hybrid education is not an assumption, but a tomorrow?

In external opinion, how to make it a reality?

Based on the experience, four key components for a successful hybrid education approach were identified.

Development of new teaching skills	Applied technologies should be seen as an opportunity for the face-to-face and distance classroom. Make students' experiences engaging to capture their interest in learning through deep and meaningful work.
Content and Platform	The curriculum should be prioritised and made more flexible, focusing efforts on the formative aspects of research training, as well as on 21 st century skills.
Accompaniment and follow-up	It is necessary to require information, monitoring and evaluation of learning in order to be able to propose those aspects that can be improved.
Equipment, infrastructure and connectivity	Digital divides need to be bridged so that both students and teachers can expand access to devices.

Table 8 Proposals

Let us consider that part of educational innovation requires a balanced interaction of the state, civil society and the market in order to change the regulatory framework that structures the digital transformation in higher education.

Likewise, the challenges experienced become challenges of creating and adapting a hybrid model that addresses the educational gaps that have been generated over the last two years, through a very complex task, especially for teachers, whose teaching work is complicated. The (CONEVAL, 2021) highlighted in its report "that one of the problems of learning at home is the lack of electronic access to the educational programme".

It is necessary to implement tasks focused on protocols to overcome in the process of the implementation of hybrid university education, such as:

Challenge 1 Knowledge of technologies	On new and emerging technologies: Are teachers able to adapt and assimilate these changes for hybrid education?
Challenge 2 Equipment, infrastructure and connectivity	HEIs will face a challenge in adapting the necessary equipment to make the two modalities as seamless as possible for the student.
Challenge 3 Avoiding student oversaturation	Students should not be overloaded with content and information, it is a matter of adapting the content to both the face-to-face and the virtual format.
Challenge 4 Teacher preparation	Programme on digital competences and new learning environments to enrich this modality.
Challenge 5 Budget shortfall	It will involve maximising the university's capacities, being efficient and seeking resources through projects and programmes to compensate for the support that is not coming through the regular budget.

Table 9 Challenges

Conclusion

After the process followed for the development of the present study, we consider that we have fulfilled the objectives set, which consisted of identifying the students' opinions on the experience they have had in the process of transition to a hybrid classroom.

This was based on a descriptive approach that gave two general results. On the one hand, opinions associated with satisfaction and, on the other, dissatisfaction, each with its own particularities and levels of opinion according to the different categories.

The results indicate that most of the students' opinions are oriented towards satisfaction. However, there were also a significant number who were classified as dissatisfied because of unequal opportunities for the support needed to meet the challenge.

It is noteworthy that, whether in terms of satisfaction or dissatisfaction, there is agreement that communication, support and accompaniment, and the attitudes of the teacher are essential for this educational model.

Despite the fact that the contingency and the return of face-to-face teaching to university classrooms has had a significant impact on educational processes, the results of this study help to identify a largely positive stance, which is encouraging, but although negative opinions were less prevalent, they cannot and should not be ignored or minimised; On the contrary, they should be considered very important to be taken into account for the great challenges that will be faced in the very near future, for which strategies have to be applied that focus on the upcoming educational challenges in HEIs, in order to lead them towards an adequate functioning of the hybrid reality even under emerging schemes in the near future.

One of the immediate challenges that HEIs and teachers will face is the transition to quality hybrid teaching in which, with the support of digital advances, they can be harnessed for the extension of coverage and flexibility required in the university context.

"The hybrid teaching and learning model is here to stay and will be our new educational reality".

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