The Hybrid Modality Model in Higher Education Institutions

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Abstracts

The aim of the article is to provide a research result to support the process of consensual and collegiate decision-making in order to mix study models in undergraduate degree courses and postgraduate projects in higher education. The deductive method was used as a starting point and a mixed phenomenological-hermeneutic approach was applied for the methodological design, based on the use of quantitative and qualitative techniques, for which a sample of undergraduate and postgraduate students was selected from the active student population in the year 2021. A structured survey was applied as a technique and a nominal scale was used to collect and analyse the data, which made it possible to determine the students' preferences according to the face-to-face or virtual modality, as well as the incidence of the mixture of both modalities for learning. The results of the research show that undergraduate students show a preference for the face-to-face modality, while postgraduate students prefer the virtual modality. From the examination of the problem, the analysis of the theoretical framework and the applied methodology, it is concluded that the results of the research can help in the process of collegiate decision making by the management agents of higher education institutions, to adequately dose the time load of the face-to-face or virtual modalities, as appropriate to the degree courses and projects.

Keywords: educational informatics; higher education; information and communication technologies; long distance education.

Introduction

For hundreds of years, including pre-industrial society before the 18th century, education was provided by the church and was entitled. Unquestionably, knowledge was imparted in a place conditioned for educational purposes and the physical presence of the teacher was indisputable (Jardines, 2009).

The Industrial Revolution marked a new educational paradigm, which was necessary to promote the development of industry and sustain the advances of scientific-technical progress achieved.

From then on, the possibility of access to education for young people was expanded. The educational function ceased to be a privilege of the few and the state began to directly influence its management (López et al., 2010).

In the heat of the developmental impetus of European societies, the need to internationalize the educational function began to take shape, as a requirement to guarantee the scientific and technical development that was already coming.

Although distance education seems to be an idea that emerged recently, the reality is that it was born in the nineteenth century and essentially remains the same, despite the influence derived from the introduction and use of new information and communication technologies, although nowadays we usually talk about online education or virtual education (Bernal, 2012; Parapi et al., 2020).

In the evolution of distance education, three stages can be distinguished: a first called correspondence education, which began with language classes in Berlin in the 1850s, although its real boom began in 1873, to establish the Society to Encourage Studies at Home" in Boston (Bozkurt, 2019; Bernal, 2012).

A second stage called electronic communications, which was put into practice in the early 1930s at the University of Iowa and Kansas State College and began with television teaching programs on an experimental basis. In the following decades, distance education took off in Europe and it was truly an unstoppable event, with the incorporation of more advanced technologies to start audio-recorded classes, both for the teaching of blind people and for the teaching of languages (Bozkurt, 2019; Bernal, 2012).

At the end of World War II, there was a boom in the use of distance education, with the aim of promoting access to higher education in the industrialized countries of the West, in Europe and in developing countries. All this is aimed at responding to the increase in the demand for skilled labour in a scenario characterised by the take-off of production, as responses to compensate for the ravages left by the war (Bozkurt, 2019).

In 1946, the first distance learning university in South Africa opened its doors. In 1947, master classes in Literature and Human Sciences began to be broadcast in Paris (Arboleda & Rama, 2013).

The third stage, called distance education universities, began in 1962 at the University of South Africa (in Pretoria) and was converted into a distance learning university to be the first in the world to develop distance learning courses (Bernal, 2012; Mpungose, 2020).

Since then, universities have required a permanent process of updating and innovation to respond to the need for connection on a global scale (Yong et al., 2017). One of the feasible paths to achieve the purpose is related to internationalization (Yue et al., 2023). To this end, the adoption of tools that guarantee a rapprochement of institutions with the international community is considered a priority task, where the massification of education is a fact that needs to be permanently observed (Brunner & Ganga-Contreras, 2016; Rama, 2001; Schulze, 2016). It requires consistent bases, duly structured and strengthened from the technical and methodological point of view.

It is necessary to consider the processes of change and transformation that have occurred in contemporary societies, which require educational institutions to have a culture based on appropriate strategies to respond to the needs of the environments where they carry out their activities (Rubio & Romero, 2006).

Distance education is one of these responses, which is called upon to facilitate the massification and internationalization of the educational function (Domínguez & Reyes, 2010; Jones et al., 2021). It is necessary that this modality be taken into account as a solution to the complex problem represented by the obstacles associated with time and space in education, through the application of methods, techniques and resources that guarantee flexibility without affecting the productivity and quality of the teaching, research and linking process with society (Alfonso, 2003; Chowdhury, 2022).

One of the most emblematic examples today is the UNIR Internet University, which has a virtual campus with 24-hour access capacity. All classes and activities are held online and he has a teaching and research career of more than 20 years of proven experience.

UNIR is a leader in innovation and research among Spanish higher education institutions, with recognition in the European and Latin American area, especially by the National Secretariat of Higher Education, Science, Technology and Innovation (SENESCYT). It has an enrollment of more than fifty thousand students and 3,140 professors who teach more than 249 degrees.

But the challenge posed by virtual education is not without barriers in the objective and subjective order (Rama, 2019; Regmi & Jones, 2020). Among the objective factors, there are financial limitations that hinder material insurance, the acquisition of technologies for teachers and students, virtual laboratory equipment and other resources that are necessary to adequately implement virtual education.

In the institutional order, it is necessary to achieve adequate understanding to introduce into practice organizational policies that favor virtuality, through the design of proactive methodologies aimed at strengthening the virtual modality in education (Regmi & Jones, 2020).

Subjective barriers are no less important and are centered on the tendency of some managers, professors, researchers, and a sector of society that, without technical or scientifically proven support, despise the virtual modality (Jokiaho et al., 2018).

It is true that in educational work the role of the teacher has been, is and will be irreplaceable (Dobber et al., 2017). The advances made in information and communication technologies confirm this paradigm. If one thing should be clear, it is that, at present, distance education does not interrupt or replace the primary role that the teacher must play, on the contrary, it can be said that it multiplies it. The aim is to make the resource, time and space more flexible in order to achieve a more inclusive, dynamic educational process and reduce the barriers that in many cases prevent students from disadvantaged social sectors from continuing their studies (Bostock, 2018; Stone et al., 2019).

Virtual classes and laboratories in the synchronous modality require the presence of the professor, who can create study groups and practical work, in correspondence with the needs and convenience of teaching, research, and linking with society (Wang & Wang, 2021).

The educational function in the twenty-first century requires the development of a new educational philosophical paradigm, which allows sufficient flexibility of forms and methods, tempered to the demands and possibilities provided by contemporary scientific-technological development applied to teaching, research and the link with society, as substantive functions of higher education.

The key axis in the virtual education mode is the teacher, but he or she must be a teacher with the preparation and methodological skills that education implies in the twenty-first century (Ticán & Deniz, 2019). Students must revolve in their environment imbued with a constructivist dynamic of teaching, research and linking with society, capable of creating their own knowledge derived from their life experiences and a research work aimed at explaining and finding solutions to the economic and social problems of their environment and the country (Universidad de Oriente [UNO], 2017).

It is based on the premise that virtual education has the potential to achieve the promotion of innovation required by the substantive functions of higher education, while at the same time constituting a paradigm of educational inclusion to respond to the demands of constant improvement of society, in the face of the advances of scientific and technological development of the twenty-first century.

Based on what has been analyzed above, the objective of the work is to provide a research result to support the process of consensual and collegiate decision-making to mix the study models in undergraduate careers and postgraduate projects in higher education.

Distance education. Its antecedents in the Latin American context

In 1947, the Federal Institute for Teacher Training of Mexico promoted the project for the improvement of teachers in practice. Twenty-one years later, the Center for Basic Education for Adults was founded (García, 1999). Thus, the institutionalization of distance education began in Latin America (Castañeda & Visser, 2005).

The Observatory of the United Nations Educational, Scientific and Cultural Organization (UNESCO), through its coordination, indicates that the genesis of distance education in Latin America is located in the decade of the seventies (Lupión & Rama, 2010; Simonson et al., 2019). If the elements that influenced its emergence are investigated, it can be seen that one of them has to do with the socioeconomic situation of the least developed and developing countries. It can be said that the need to achieve inclusive education is one of the implicit causes in the process of expansion of distance education (Moriña, 2019), despite the fact that there is a fundamental conditioning factor in the sense that education is a key element of social mobility. Latin America is the region of the world with the greatest inequality (Fortunato et al, 2020) and this is related to the lack of social mobility (Nina & Grillo, 2000).

In the university environment of Ecuador, on September 2, 1976, it marked a milestone in Latin America, by launching for the first time the modality of distance studies in the career of Education Sciences, which made possible access to people from all over the country, who previously could not fulfill their dreams of obtaining a third-level degree due to its geographical location (Valdés & Ganga-Contreras, 2020).

Widespread access to the Internet from the first decade of this century made possible the introduction of online, synchronous and asynchronous teaching modalities in Ecuadorian universities, but their real boom occurred from the impact of the COVID-19 pandemic between 2020 and 2021 (Cho & Hong, 2021; Lázaro et al., 2020).

The hybrid modality (face-to-face-online) began to be introduced in 2012 in some universities in the United States. The dissemination of the various experiences carried out is exposed in (Beatty, 2019).[1]

The Academic Regime Regulations of the Council of Higher Education of Ecuador of the year 2019, in Article 70 establishes the modalities of study or learning and endorses that higher education institutions may teach their careers and programs in the following modalities of study or learning: a) Face-to-face; b) Blended learning; (c) Online; d) Remote; e) Dual; f) Hybrid (Council of Higher Education [CES], 2019, p. 31). In accordance with what the authors have pointed out (Mayorga-Albán et al., 2020)

Later, through Resolution RPC-SO-16-No.331-2020, adopted by the Plenary of the Council of Higher Education in its Sixteenth Ordinary Session, held on July 15, 2020, Article 74 is added, where it is established that: "The hybrid modality is the one in which the components of learning in contact with the teacher, practical-experimental and autonomous learning of all the hours or credits, they are developed through the combination of face-to-face, blended, online and/or distance activities; with the use of physical and digital teaching resources, interactive multimedia technologies and virtual learning environments, which organize the interaction of the actors in the educational process, synchronously or through digital platforms" (CES, 2019, p 33).

It can be argued that the hybrid modality offers learning opportunities that the student himself chooses and the educational institution provides, such as face-to-face classes or synchronous or asynchronous online virtual classes with flexibility (Hagemeijer & Dolfing, 2022). The essence of the flexible hybrid modality allows the creation of courses that allow students to choose between attending face-to-face or virtually, synchronously or asynchronously, without losing quality in content and learning.

The hybrid modality constitutes a service based on more complete methodologies for students, who can create their own learning experience, in accordance with those indicated by (Beatty, 2019). It allows higher education institutions to expand their study offerings to students living in remote areas and to maintain class periods even in times of crisis.

By linking socioeconomic conditions and education as a vehicle for social mobility, one's own circumstances imply the search for alternatives for social mobility as a possibility to access education, mainly at the third and fourth levels (McKenzie et al., 2018). Some authors such as Chan-Núñez (2016) point out that, "this situation allowed the construction of alternative models based on principles of popular education, such as horizontality, training based on community

[1] Appendix A of the textbook *Hybrid-Flexible Course Design* by the author Beatty (2019) contains more than 80 references to texts, papers or articles on case analysis in this unique change that has taken place in the last 17 years.

interests, collaboration, action research and self-management as the main aspiration in training processes" (p.9).

In 1992, the company Informática y Software (InSoft) began videoconferencing meetings for companies and education. On January 25, 2013, the company Zoom Video Communications developed and launched the Zoom program, based on video chat software that as of 2019 became popular in companies and particularly in the educational system. For obvious reasons, it is one of the preferred ones in higher education to teach classes, work in groups that share their presentations, questions, and messages, as well as many other teaching and research activities (Vera, 2021).

Virtual learning environments (VLEs) have generated new methodological proposals with their rapid incorporation by higher education institutions around the world and in Ecuador (Flavin & Bhandari, 2021). They were generalized as a teaching-learning environment to communicate to participants online through presentations, group work, materials such as articles, texts, questionnaires, audios, all in digital formats. Videoconferencing is the most widely used option for communication between teachers and students, with the possibility of online access 24 hours a day (Herrera, 2017).

The virtual learning environment is a space for information and social communication, in which teachers and students interact as actors for teaching and learning. A space that can enrich traditional classes by being used in both virtual and face-to-face classes.

The dimension experienced in distance education can be seen as an evolved educational mode, which contrasts with the traditional face-to-face that was consolidated during the industrial revolution. That is why the creation of innovative variants is a demand of the knowledge society, which shows a new educational modality to break down borders and allow a fragmentation of educational processes to make the barriers derived from time and space in education more flexible.

Necessary reflections on distance education

The desire to expand the geographical coverage of university education to remote places has been an aspiration for years, it has followed different forms such as correspondence and distance learning, which gradually included telecommunications as support (Kornytska et al., 2023). The fundamental purpose lies in guaranteeing access to inclusive university under conditions of equality. As pointed out (García, 1999), there are multiple socio-political and technological factors that led to the birth and subsequent development of open and distance learning systems.

With the massification of the Internet, universities created platforms such as learning management systems (LMS) through software. Such systems allow teachers to create, share, and disseminate content such as materials, assignments, online assessments in the course time sequence. Moodle is the most widely used open source LMS. (Evgenievich et al., 2021).

Teaching activities can be done asynchronously, usually known as online or synchronous virtual activities scheduled at assigned times.

Among some of the innovative initiatives is the massive open online course (MOOC), which is an online learning modality with an impact on educational work on a global scale (Aparicio et al., 2019). It is aimed at an unlimited number of participants through the Internet, according to the principle of open and mass education to break with the limitations of time and space, imposed by traditional face-to-face education (Atiaja & García, 2020).

The objectivist approach to learning is based on the criterion that knowledge can be transmitted in person by the teacher or through technology. It is a novel conception that involves the analysis, representation and reordering of content and exercises to be transmitted in an appropriate and organized way to students (Al-Rahmi et al., 2019). Constructivism assumes that knowledge is elaborated individually by students, based on their own experiences and representations of the world. It requires the teacher to be able to design an environment that engages students in the elaboration of new knowledge in order to break with the simplistic conception of reproductive education, where the teacher limits himself to transmitting knowledge and experiences, which students will have to reproduce later (Esteban, 2002).

The objectivist approach assumes that the teacher is trained to constantly innovate objectivist learning methods, with the ability to make the most of the advantages offered by new information and communication technologies (Godino et al., 2019). The challenge is to prepare and incorporate innovative professionals into society, who are able to transfer their knowledge and experiences in a creative way in response to the demands of scientific and technical development.

The social scenario generated by the impact of COVID-19 on a global scale demonstrated the importance of virtual education (Cho & Hong, 2021). Due to the limitations imposed by the health authorities, the educational processes in the traditional face-to-face modality were abruptly interrupted. Only the institutions that develop virtual educational activity were able to continue their teaching and research activities and, with some limitations, the link with society.

The mobility limitations imposed by the impact of the pandemic caused by COVID-19 implied the need to adopt virtuality very urgently, where there was no lack of improvisations in a process that requires the design and preparation of specific methodologies and technical and technological assurance that had not been carried out in advance (Tadesse & Muluye, 2020; Tarkar, 2020).

In the new scenario, it was necessary to generate substantial changes and transformations in higher education institutions, to adapt the educational process to a new non-face-to-face reality of the teacher and students, that is, to undertake the distance education modality in all its dimensions, now with the support of the latest information and communication technologies (Di Pietro et al., 2020).

The situation created by the impact of COVID-19 demonstrated the potential offered by the flexibility of time and space, through the use of new technologies to give continuity to the teaching process, undertake research projects and transfer knowledge to society through linkage. All this required adapting traditional pedagogical methodologies to the modality of virtual education, to the new demands in a complex scenario of social immobility and the lack of practical experiences on the part of teachers and students, especially the management of remote communication software and resources (Chávez et al., 2021).

After the sudden change and a process of adaptation to virtuality, with the return to face-to-face classes in 2022, a new teaching-learning modality known as hybrid was generated, in which it is attempted to simultaneously achieve the advantages of face-to-face classes on university campuses and the flexibility of time and space offered by virtual or online classes (Río Frio et al., 2022).

Recent advances in videoconferencing technology and the growing breadth of high-speed Internet networks allow the organization of groups of students at a distance, sharing images, messages, and presentations, either with the teacher or with each other, working in groups and all in real time (Cantú-Martínez, 2022).

Method

The paradigm associated with the deductive method (Polese et al., 2015) is used to answer the research question, which seeks to determine the feasibility of introducing the hybrid modality (combination of face-to-face and educational virtuality), based on the manifest preferences of undergraduate students and graduate programs. in relation to face-to-face or virtual education models, as the case may be, at the Pontificia Universidad Católica del Ecuador Manabí campus, after two years of going through virtual education as a result of the COVID-19 pandemic.

As a premise, it is defended that the hybrid modality is feasible, as long as it responds to a complex analysis, which is based on the consensus criteria and the preferences of the students on the face-to-face or virtual modalities, so that it serves as an aid for the process of collegiate decision-making, regarding the dosage of the workload of the subjects in both modalities and complies with the regulations issued by the higher management bodies. in the interest of ensuring an effective and high-quality educational process. To this end, the research adopted a mixed approach, as a situational approach is carried out in a broad and comprehensive way, with the use of qualitative and quantitative techniques (Bozhkova et al., 2021; Hernández et al., 2010).

The information was obtained with a phenomenological-hermeneutical approach, taking into account the experiences lived by students regarding education models, from the perspective of undergraduate and graduate students after having received their classes in virtual mode for two years 2020-2021 (Fuster, 2019).

The quantitative technique was carried out by analyzing the data derived from the survey applied to the selected sample. This sought to contrast the acceptance of students in relation to the models of face-to-face and virtual education. The final results were obtained according to a mixed convergent analysis, which consisted of the development of two sequences, one qualitative and the other quantitative. In the first, the criteria of teachers and students were considered in relation to their expectations about the two modalities studied. The second consisted of the formulation of hypotheses, the application of the survey, as well as the processing of the data and its analysis.

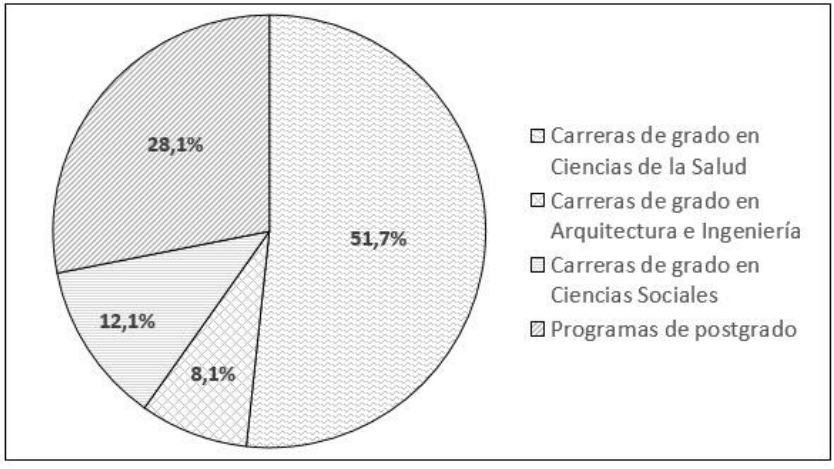
The convergent analysis was based on qualitative categorization and statistical results, to reach conclusions about the preferences of students for the modalities studied, so that it could serve as an aid to the management managers of the institution, in the decision-making process to dose the

workload by careers or projects through the application of a mixed modality. Descriptive statistics were used in the processing of the results obtained.

Participants and quantitative techniques

The collection of quantitative information was carried out through the processing of the survey to an intentional sample of 491 students, which represents 35% of the student population of the campus at the end of 2021, with a margin of error = 4%, confidence level = 95% and heterogeneity = 50%. Figure 1 shows the distribution of the sample of the students surveyed according to the modality of studies.

Figure 1. Distribution of the sample of the students surveyed according to the study modality



Source: Authors' elaboration based on the study of the sample. In original language Spanish.

The stratification considered two groups: the first made up of undergraduate students and the second with graduate students, in order to determine the variation of perceptions related to the preferences of the education model studied.

The sample is made up of 350 undergraduate students, distributed in the careers of Health Sciences, Architecture and Engineering and Social Sciences and 141 correspond to students of the graduate programs.

The sample of undergraduate students in health sciences careers was enhanced, since the Council of Higher Education (CES) in Ecuador expressly requires that 75% of the hours taught be face-to-face in these careers.

Data collection and processing

For the collection and analysis of the data, a nominal scale was considered, which made it possible to determine the preferences of the students according to the modality of study, as well as the incidence of the appropriate mix of them for learning. A five-value Likert scale (Jebb et

al., 2021) was applied to evaluate the survey: strongly agree 1 point; I agree quite 2 points; neither agree nor disagree 3 points; somewhat disagree 4 points and; strongly disagree 5 points. The aim was to contrast the acceptance of the modalities, after the students were exclusively in the virtual modality for four semesters.

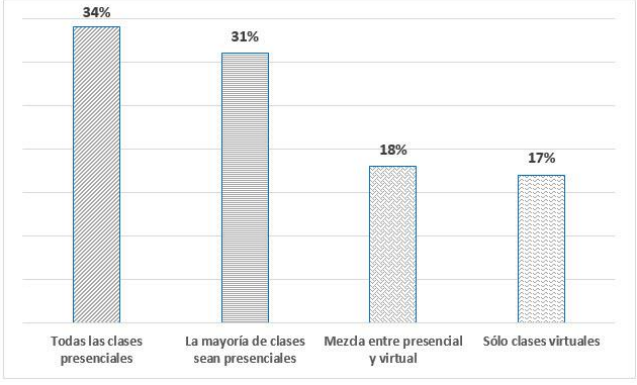
The survey was anonymous online by inviting students to answer the link that was published online, after the corresponding motivation to achieve their collaboration. All students enrolled in the 2020-2021 academic year were considered as inclusion criteria, provided that they agreed to participate in the study. As an exclusion criterion, do not apply the survey to students who do not express their willingness to participate.

Data were collected taking into account undergraduate careers and at the level of postgraduate projects, to know the preferences of the different study modalities and their level of acceptance. To this end, several statements were included in the survey, about how teaching should be in universities and the incidence of mixing them and how this can affect learning.

Results

Related to the students' preferences on the modalities studied, the results are shown in the graph in Figure 2.

Figure 2. Student preference for study modalities. In original language Spanish.



Source: Authors' elaboration based on the results of the survey

The result of the survey on the preference of study modalities by students revealed that 34% preferred that all classes be face-to-face; 31% chose that most classes be face-to-face and the others virtual; 18% opted for a mix between face-to-face and virtual; 17% say that they prefer total virtuality.

Related to the behavior of undergraduate and graduate students' preference for study modalities, the results are shown in Table 1.

Table 1. Student preference for the modality of study according to levels. In original language Spanish.

	NIVELES		Porcentaje	
Preferencia de los estudiantes	Posgrado	Grado	Posgrado	Grado
Todas las clases presenciales	14	156	10%	45%
La mayoría de las clases sean presenciales	20	132	14%	38%
Todas las clases virtuales	70	15	50%	4%
Mezcla entre presencial y virtual	37	47	26%	13%
TOTAL	141	350	100%	100%

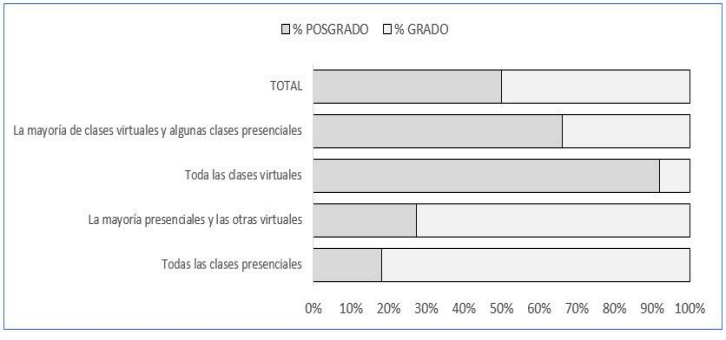
Source: Authors' elaboration based on the results of the survey

45% of undergraduate students preferred that all classes be face-to-face; 38% considered that most classes should be face-to-face; 13% opted for a mix between face-to-face and virtual modalities; only 4% said that all classes were virtual.

The result of the survey of graduate students revealed that 50% preferred virtual education; 26% opted for a mix between face-to-face and virtual modalities; 14% opted for most classes to be face-to-face; while 10% were inclined towards all face-to-face classes.

Figure 3 shows the graphic result of the analysis related to the preferences of the students according to the modality of study.

Figure 3. Student preferences according to the mode of study. In original language Spanish.



Source: Authors' elaboration based on the results of the survey

The analysis of the information reflected in Figure 3 revealed that most graduate students expressed a preference for the virtual modality, while undergraduate students preferred the face-to-face modality.

Table 2 shows the results of the analysis on the preferences of undergraduate students by career.

Table 2. Analysis of undergraduate students' preferences by careers. In original language Spanish.

Modalidad de estudio	Carreras			Porcentaje		
	Ciencias Sociales	Ingeniería y Arquitectura	Ciencias de la Salud	Ciencias Sociales	Ingeniería y Arquitectura	Ciencias de la Salud
Todas las clases presenciales	20	12	125	34%	32%	49%
La mayoría presenciales y las otras virtuales	18	17	97	31%	45%	38%
Todas las clases virtuales	8	2	5	14%	5%	2%
La mayoría virtuales y algunas presenciales	12	7	27	21%	18%	11%
TOTAL	58	38	254	100%	100%	100%

Source: based on survey results

The result of the survey confirmed that, in the case of undergraduate students, there is a predilection for the face-to-face modality, especially the Health Sciences career, where 49% prefer this modality. Without failing to highlight the emphasis on the face-to-face modality, but which considers a part of the time in the virtual modality, especially technical careers.

As a reference element, the preferences of the students were analyzed based on the distance from where they live to the university and their results are shown in table 3. To do this, those who live more than 60 kilometers (+60 km) and those who live up to 60 kilometers (up to 60 km) from the campus were considered.

Table 3. Incidence of the distance where students reside to the campus in the preference of teaching modality. In original language Spanish.

Preferencia de la modalidad de enseñanza	Distancia de la residencia de los estudiantes hasta el campus		Porcentaje	
	+ 60 km	hasta 60 km	+ 60 km	hasta 60 km
Todas las clases presenciales	27	134	31%	42%
La mayoría presenciales y las otras virtuales	32	116	38%	36%
Todas las clases virtuales	9	23	10%	7%
La mayoría virtuales y algunas presenciales	18	47	21%	15%
TOTAL	86	320	21%	79%

Source: Authors' elaboration based on the results of the survey

The analysis of the data indicates that 79% of the students live within 60 km of the University. However, only 10% of those who live more than 60 kilometers away prefer the virtual modality. This confirms the importance that undergraduate students attach to face-to-face learning.

In relation to the criteria on how teaching should be in universities and the incidence of the mixture of modalities, the results are shown in Table 4.

Table 4. Comparison of responses by levels of study and the impact of the mixture of modalities on learning. In original language Spanish.

Afirmaciones	De acuerdo		En desacuerdo	
	Grado	Posgrado	Grado	Posgrado
Considero que las clases virtuales son tan efectivas como las presenciales para aprender	21%	76%	60%	14%
Prefiero las clases presenciales con el docente mucho más que hacerlo a través de la pantalla.	86%	35%	10%	42%
La mezcla de enseñanza presencial con la enseñanza virtual es lo mejor para el aprendizaje.	32%	47%	40%	19%
Resido lejos de la universidad y las clases virtuales en pantalla me han sido de gran ventaja.	44%	100%	36%	9%
La enseñanza universitaria debe mezclar clases presenciales y clases virtuales.	**33%**	**56%**	**48%**	**23%**
Aprendo lo mismo si las clases son virtuales que si son presenciales.	32%	53%	47%	24%
Las universidades deben permitir que el estudiante pueda elegir entre clases presenciales o virtuales.	20%	65%	67%	17%
Considero que sólo las clases de laboratorios deberían ser impartidas en forma presencial.	**61%**	**95%**	**19%**	**10%**
La mayoría de los profesores acostumbran a realizar trabajos de grupos en las clases vía Zoom.	37%	65%	62%	20%
En las clases recibidas, los docentes han demostrado conocer bien el uso de Moodle y de Zoom.	**68%**	**87%**	**12%**	**7%**
Cuando recibo clases por Zoom me distraigo mucho más que cuando estoy con el profesor al frente.	**64%**	**86%**	**15%**	**6%**
Las fallas en las conexiones de internet me han perjudicado en las clases virtuales recibidas.	71%	29%	16%	52%
Lo ideal sería que el estudiante decida si recibir clases virtuales o asistir a las clases presenciales.	**71%**	**27%**	**15%**	**47%**
Mezclar la enseñanza tradicional con la virtual y en línea permite mayor colaboración de actores del aprendizaje, docentes y alumnos de distintos lugares.	**62%**	**90%**	**17%**	**9%**
El uso de Zoom me ha permitido realizar tareas y estudio en grupos de trabajo muchas veces.	42%	80%	30%	12%
La modalidad virtual me ha permitido estudiar por mi cuenta o en grupo en cualquier lugar y momento	**68%**	**101%**	**12%**	**8%**

Source: Authors' elaboration based on the results of the survey

It can be observed that the majority of graduate students agree with the virtual modality, in contrast to what was stated by undergraduate students who reinforce their preference for the face-to-face modality.

Discussion and conclusions

From the paradigm of the deductive method, the research problem was identified and the examination and analysis of the general theories related to the teaching modalities was carried out, especially during the years 2020 and 2021, which motivated by the COVID-19 pandemic was practically forced to move abruptly from face-to-face to the virtual modality.

It is argued that the combination of face-to-face and virtual learning is feasible, as long as it responds to a complex analysis, which is based on the consensus criteria and the preferences of

the students on the modalities studied, so that it serves as an aid for the process of consensual and collegiate decision-making, regarding the dosage of the workload of the subjects and is adapted to the regulations issued by the higher management bodies. in the interest of ensuring an effective and high-quality educational process.

For the development of the research, a phenomenological-hermeneutical approach of a mixed type was designed and applied (Fuster, 2019), which is based on a broad and comprehensive situational incursion through the use of quantitative and qualitative techniques, based on the experiences lived by the students regarding the models of education and what their expectations are in this regard. in accordance with what was stated by (Bozhkova et al., 2021; Hernández et al., 2010).

The examination of the theoretical framework allowed us to know the particularities associated with virtual education, as a model that allows time and space to be flexible, which makes it possible like no other modality, to dynamize the teaching and research process to promote broader access to education, with proven potentialities to facilitate the internationalization of knowledge and research results. in line with what was proposed by (Alfonso, 2003; Chowdhury, 2022).

It is true that virtual education is not a new phenomenon. Its seeds are located in the nineteenth century, although its real boom took place in the years after the Second World War, as a way capable of responding to the need to expand educational capacity in the interest of facing the challenge of scientific-technological development, which occurred to achieve recovery from the ravages and consequences of war. especially in European countries, in accordance with what was analyzed by (Arboleda & Rama, 2013; Bernal, 2012; Mpungose, 2020).

From then on, virtual education continued to develop and expand as an effective way of global connection, to strengthen the internationalization of education, but never before has it become more necessary than after the impact of the COVID-19 pandemic. As a result of the health measures adopted on a global scale, the model of face-to-face to virtual education was changed very quickly and abruptly (Vera, 2021). Most teachers and students were forced to face the virtual modality, without prior preparation that would allow them to assimilate the change adequately, in accordance with what was pointed out by (Brunner & Ganga-Contreras, 2016; Rama, 2001; Schulze, 2016).

The inclusion of the hybrid modality by higher education institutions and the isolation caused by the COVID-19 pandemic in 2020 and 2021, forced institutions to introduce substantive changes in terms of study modalities, with real possibilities of maintaining them in the future, in particular postgraduate programs. in accordance with what has been pointed out by (Beatty, 2007 P 24-33; Cho & Hong, 2021; Lázaro et al., 2020).

However, the research revealed that in general, 83% of students prefer to maintain some or all face-to-face classes, with emphasis on undergraduate students and among them those linked to Health Sciences careers.

The rejection of virtuality by undergraduate students can be a multifactorial problem that must be investigated in sufficient depth. It is probably related to the need for socialization of young

people, who are not yet working and can attend university daily. Other factors can be technical, technological, economic and psychological, just to mention a few.

The research revealed that a significant number of students say they are fed up with virtuality, that they need to rescue the social friction that physical contact with professors and their fellow students provides. They consider that virtuality could be taken advantage of by adequately managing the workload in some subjects, but with a predominance in the face-to-face modality, in accordance with what was indicated by (Río Frio et al., 2022).

Especially in the case of undergraduate students, they expressed a preferential inclination for the face-to-face modality. They state that when they receive classes by Zoom they are more distracted than when they are physically in front of the teacher. Some report that at home they do not have the ideal conditions to concentrate in classes and that Internet access is not always adequate.

The majority of students in careers related to health sciences state that face-to-face classes should occupy most of the class time, which shows correspondence with the regulation established by the Council of Higher Education of Ecuador. Some pointed out that there are certain subjects that necessarily require the physical presence of the teacher and students, but that there are others where virtuality can be applied.

The analysis of the influence that the distance between the students' residence and the university can exert allowed us to verify that most students who reside more than 60 kilometers from the campus prefer face-to-face attendance. A third of these opted for the virtual modality totally or most virtual classes and some face-to-face.

In relation to postgraduate students, the situation is different. Most prefer total virtuality or a mix between virtual and face-to-face classes. In relation to the criteria addressed, it is pointed out that virtual classes are as effective as face-to-face classes for learning and constitute a facility for students who live far from the study campus. Virtuality allows a wider field of knowledge to be opened up through research and independent study that can be carried out anywhere and at any time. They argue that the appropriate mix of virtuality with face-to-face learning allows for greater collaboration between learning actors. They emphasize that the university must allow the student to choose between face-to-face or virtual classes.

The examination of the theoretical framework and the results of student surveys, as well as the risks to which modern society is subjected and the great possibilities offered by contemporary technological development for the benefit of education, allows us to observe the need to evolve in philosophical thought linked to traditional educational models. It is necessary to face the new challenges with innovative thinking, which allows to temper educational needs based on innovative models that incorporate the accumulated experiences and the results of scientific-technological development, with the support of the possibilities offered by new technologies that allow a flexible, inclusive and efficient system in the substantive functions of higher education.

The development of the work made it possible to verify the hypothesis raised and meet the proposed research objective, so it can be stated that the results of the work can constitute an aid for the management agents of higher education institutions, in order to adopt consensual and

collegiate decisions to establish a mixed teaching model and achieve an adequate dosage of the new educational models. according to the interests of each career and postgraduate project, provided that adequate efficiency and high quality in the fulfillment of the substantive functions of the university are guaranteed and the regulations issued by the higher management bodies are complied with.

For all these reasons, it can be pointed out that it may be feasible to readjust the application of the study modalities for undergraduate and graduate degrees: for undergraduate degrees in Health Sciences, Social Sciences and Technical Sciences, adopt a mixed system made up of between 50% and 75% of the time with face-to-face classes and the rest with the virtual modality. For graduate programs, assume between 80% and 90% of virtual classes, the rest of the time with face-to-face classes, which can be distributed between the first class of the program, face-to-face consultations for the presentation of the research project and the degree exercise with the defense of the thesis.

Limitations

As limitations, we can point out the influence exerted by the traditional educational culture based on the presence of the teacher, as an irreplaceable element in the teaching-learning process, which hinders and hinders the understanding and assimilation of the importance and repercussions of assisted education with the appropriate use of technologies. The lack of preparation and training of teaching staff in the handling and management of new technologies and the lack of knowledge about educational methodologies based on the concepts of virtual education.

Future line of research

As a future line of research, it is interesting to continue deepening the study and reflection related to the teaching-learning process assisted by information and communication technologies, especially the hybrid modality, as a way to guarantee the universal right to quality education. The promotion of projects aimed at increasing the training and preparation of university teachers in the handling and management of technologies, as tools capable of offering useful assistance in the teaching-learning process, as well as in the mastery of pedagogical methodologies that enable a greater active involvement in the teaching process and student learning.

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Statement of Supplementary Material

The article does not have supplementary material

Statement of contributions

The author declares that he has contributed in the following roles: J.L.C.G, writing the postulated version of the article; the management of the investigative process and; obtaining funds, resources and technological support and the development of research. The co-author AVP methodological design; software; validation; formal analysis; revision and editing of the article; visualization; supervision.

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