

Evaluation of the blended modality in Health Sciences degree programs

Evaluación de la modalidad semipresencial en asignaturas de grado de Ciencias de la Salud

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Summary:

Introduction: Learning management systems have attracted great attention after the COVID-19 pandemic for the development of virtual (remote) and blended learning modalities in higher education institutions. These processes deserve a constant evaluation process to carry out interventions to strengthen them and adapt to the requirements of teachers and students. The objective of the present study was to compare the partial grades of students who took subjects in face-to-face and blended mode at the Faculty of Health Sciences and to evaluate the degree of student satisfaction with the blended mode. Methodology: Descriptive, retrospective and quantitative study. The sample consisted of 2,356 partial grades of 45 subjects and 189 students from the Faculty of Health Sciences. The Satisfaction Questionnaire of university students towards Llorente's online training was implemented. Results: Mean grades ranging between 6.49 and 6.60 were found in the compared periods without detecting statistically significant differences. Regarding student satisfaction, a higher level of satisfaction was identified with aspects related to the teacher-tutor and satisfaction was high in all dimensions. Conclusion: The grades are equivalent in the periods compared, showing that blended attendance did not impact the students' partial grades for the better or worse in the period studied, and the level of student satisfaction was high and was linked to a good connection. to the internet, younger age and location of learning.

Keywords: Medical Education, Distance education, Students

Resumen:

Introducción: Los sistemas para la gestión del aprendizaje han captado gran atención después de la pandemia por COVID-19 para el desarrollo de las modalidades de enseñanza virtual (remoto) y mixta (blended learning) en las instituciones de educación superior. Estos procesos merecen un proceso de evaluación constante para realizar intervenciones para su fortalecimiento y adaptación a los requerimientos de docentes y alumnos. El objetivo del presente estudio fue comparar las calificaciones parciales de los alumnos que cursaron asignaturas en modalidad presencial y semipresencial de la Facultad de Ciencias de la Salud y evaluar el grado de satisfacción del alumnado con la modalidad semipresencial. Metodología: Estudio descriptivo, retrospectivo y cuantitativo. La muestra estuvo constituida por 2356 calificaciones parciales de 45 asignaturas y 189 alumnos de la Facultad de Ciencias de la Salud. Se implementó el Cuestionario de Satisfacción de alumnos universitarios hacia la formación on-line de Llorente. Resultados: Se encontraron medias

de calificaciones que oscilaban entre 6,49 y 6,60 en los periodos comparados sin detectarse diferencias estadísticamente significativas. Respecto a la satisfacción del alumnado, se identificó un mayor nivel de satisfacción con los aspectos relacionados con el profesor-tutor y la satisfacción fue alta en todas las dimensiones. Conclusión: Las calificaciones son equivalentes en los periodos comparados, mostrando que la semipresencialidad no impactó para mejor, ni peor en las calificaciones parciales de los alumnos en el periodo estudiado, y el nivel de satisfacción de los alumnos fue alto y estuvo vinculado con buena conexión a internet, menor edad y sede del aprendizaje.

Palabras clave: Educación Médica, Educación a distancia, Estudiantes

1. Introduction

The alternating modality in university study, often called “blended”, requires the application of specific strategies that differentiate it from distance lecture classes or traditional teaching mediated by digital technology. The blended teaching model involves the virtual classroom as a space associated with the physical classroom or *blended learning* (1). This consists of the combination of teaching and learning activities in physical spaces (classrooms, simulation centers, healthcare institutions, laboratories) with others that are carried out in virtual environments or digital spaces (computer platforms, especially educational ones, email, messaging, etc.) (2). This type of teaching modality is based on the autonomy granted to students to regulate their learning of the contents, the flexibility of the times dedicated to study, the use at will of different spaces for reading and productions. The latter, preferably generated within collaborative groups (3). Of course, an adequate internet connection, the availability of virtual platforms and the appropriate equipment are required. When the barrier of the physical classroom is broken, learning becomes ubiquitous and can occur “at any time and in any place” (4).

Under the blended modality, the time distribution of the synchronous and asynchronous sessions is regulated by a schedule prepared by the teacher with the topics and scripts that will be developed in the face-to-face sessions. Outside of the scheduled meetings, students have the possibility of investing their time in the way that is convenient for them, both dedicated to searching for educational material and studying and developing the activities assigned to them (5). The main responsibility of teachers, in addition to knowing their subjects, involves helping in the learning of social skills and interpersonal relationships, an area where presence has a crucial role, but where virtuality has long demonstrated its enormous possibilities. Another important function of the teacher is to help students select and filter relevant information for the subject, as a facilitator of the growth of a knowledge network, where ideas and information can flow in multiple directions, being elaborated and improved in said process (6-7).

During the COVID-19 pandemic, the activity of Health Sciences majors in our institution was maintained uninterrupted thanks to the application of certain teaching strategies and educational technology appropriate to the circumstances. This allowed us to recognize the advantages that in some cases teaching mediated by Information and Communication Technologies (ICT) can provide, but at the same time, it became evident the impossibility of achieving adequate training when it is essential to carry out face-to-face activities. due to the practical nature of the health sciences disciplines (8). It is for this reason that most health courses apply the regulations corresponding to their in-person status. Once the pandemic was over, we sought to develop the classes of subjects with a high index of theoretical content under the blended modality, taking into account that both teachers and students were familiar with the institutional campus and with the platforms for the development of classes. remotely. Both students and teachers had previously reported their desire to continue with some subjects using resources mediated

by ICT, and stated that they had all the technological resources and internet access necessary for the development of activities in a blended format.

Various studies have mentioned the need to analyze the impact of new education formats on students' grades and achievement of competence (9); In this regard, a study carried out in Argentina (10) in which teachers were consulted about their perception of students' grades in the face-to-face and remote periods, found that less than half of them considered that the grades were similar, while , from the students' perspective, a mostly positive perception towards the blended modality has been described (11-13).

In our institution, in 2021, the implementation of subjects with a blended modality began in which students and teachers alternate attendance in the physical classroom with virtual activity, and this process was accompanied from its planning to its execution, by the department of training of teachers and the educational management team (deans and career directors). Therefore, the objective of this study was to compare the partial grades of students who took subjects in face-to-face and blended teaching at the Faculty of Health Sciences, and to evaluate the degree of student satisfaction with blended teaching.

2. Methods

This is a descriptive, retrospective study with a quantitative approach. 45 subjects were included that were taken in the blended modality during the year 2022 and that were compared with their grades during their in-person teaching in 2018 and 2019, for a total of 2,356 observations. The institution uses a rating scale that ranges from 0 to 10, which responds to the logarithmic format, with the evaluation instances being approved with a rating of 4 (four) equivalent to 60% of the evaluated criteria.

A total of 189 students from the Faculty of Health Sciences majors were included: Medicine, Nursing, Nutrition, Music Therapy, Kinesiology and Health Services Administration from the four campuses of a private university in Buenos Aires, Argentina, who They were enrolled in the first quarter of 2022 in the subjects under the blended modality. The sample represents 62.79% of those enrolled in blended subjects, for a confidence level greater than 95% and a margin of error less than 5%. In the case of students, the inclusion criteria were: being enrolled in the first semester of 2022, being studying subject(s) in the blended modality and voluntarily responding to the instrument. Incomplete instruments were excluded.

To obtain the students' grades, a request was made to the institution's systems department, who provided the data of the requested subjects for the three analysis periods. No personal data of the students was included, but the grades were obtained by subject, without performing individual analysis of the observations. Partial grades were selected, given that students often do not complete their final evaluations once they have completed the subjects, which could include biases related to the population and the teaching modality in the different periods compared.

To evaluate student satisfaction with blended subjects, the Satisfaction Questionnaire of university students towards online training (CUSAUF) by Llorente (14) was implemented. This instrument is made up of 28 items, which are answered in a Likert-type format with 4 response options: Very low, Low, High and Very high, equivalent to scores one to four, respectively. The items of the instrument are grouped into 5 dimensions: General aspects of the subject (items 1-3), aspects related to the teacher-tutor (items 4-12), aspects related to the contents (items 13-21), related aspects with communication (items 22

and 23) and learning environment (items 24-28). The instrument was uploaded to the Google Forms platform and sent to the students via email, inviting them to participate.

Once the data from both the subjects and the students had been collected, they were extracted into an Excel database and analyzed using the Infostat/L program. For the qualitative variables, the calculation of absolute and relative frequencies was carried out, and for the quantitative variables, the calculation of the mean, standard deviation and 95% confidence indices was carried out. Given the behavior of the variables and the type of sampling (intentional), the Mann-Whitney Wilcoxon U tests were implemented for comparison of means in two groups, the Kruskal Wallis test for comparison of means in three groups, and the correlation test. Spearman to identify the relationship between quantitative variables. A significance level of $p < 0.05$ was set.

In ethical aspects, it is highlighted that the study was carried out within the framework of academic management activities to analyze the implementation of the blended process in the subjects of the Faculty of Health Sciences. The participation of the students was at all times highlighted as voluntary and the signing of the Informed Consent was requested. No personal data was collected such as file numbers, document numbers, names, surnames or other information that would allow the respondent to be affiliated with the completed instrument.

3. Results

Comparison of qualifications in blended mode vs. in person

980 partial grades from 2018, 944 from 2019 and 432 from 2022 were analyzed. The average grade in the compared periods ranged between 6.49 for 2018 and 6.60 in 2022, with the lowest and highest scores, respectively. The comparison of grades by major was carried out, finding statistically significant differences in the majors of Medicine ($p: 0.003$), Music Therapy ($p: 0.010$) and Health Services Administration ($p: 0.001$). In the case of Medicine, the average grade in 2019 increased compared to 2018, going from 6.82 to 7.18, while in Music Therapy an increase of 1.01 points was found in the grades between the periods 2019 and 2022 going from 5.96 to 6.97. Finally, the Health Services Administration major showed a decrease in scores in 2019 (figure 1).

Student satisfaction with the blended modality

189 students from the second to sixth year of the curriculum were surveyed with an average age of 25.23 years (SD: 7.59), mostly women (78.31%), from the institution's headquarters (61.38%) and the nutrition (41.27%) and medicine (37.04%) majors. Respondents evaluated the connectivity in their homes as good at 82.54% and connected to classes from computers at 93.65%.

When analyzing the degree of student satisfaction with the blended modality, it was identified that in all the dimensions evaluated the average was higher than 3 points out of 4, categorizing satisfaction as high. Of the 5 dimensions evaluated, the highest mean was identified in the aspects related to the teacher-tutor with a mean of 3.40 (SD: 0.50, 95% CI: 3.33-3.47), while the lowest average was obtained in aspects related to the learning environment with a score of 3.31 (SD: 0.55, 95% CI: 3.23-3.39) (figure 2). The overall mean satisfaction was 3.36 (SD: 0.48, 95% CI: 3.29-3.43) and could be categorized as high.

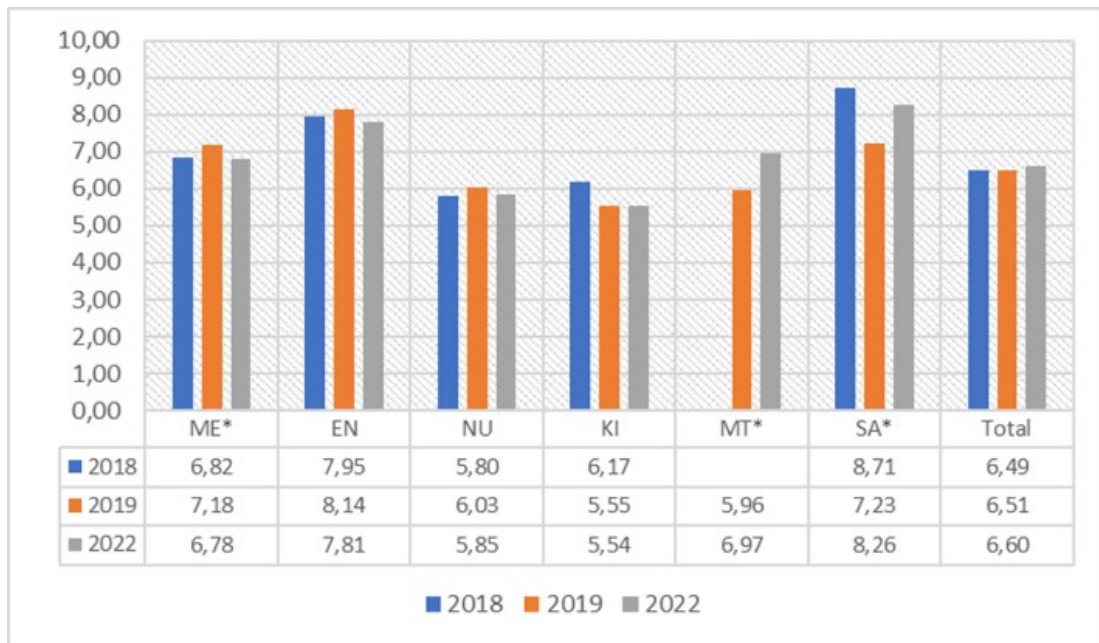


Figure 1. Average grades by degree and period. *Means with statistically significant differences.

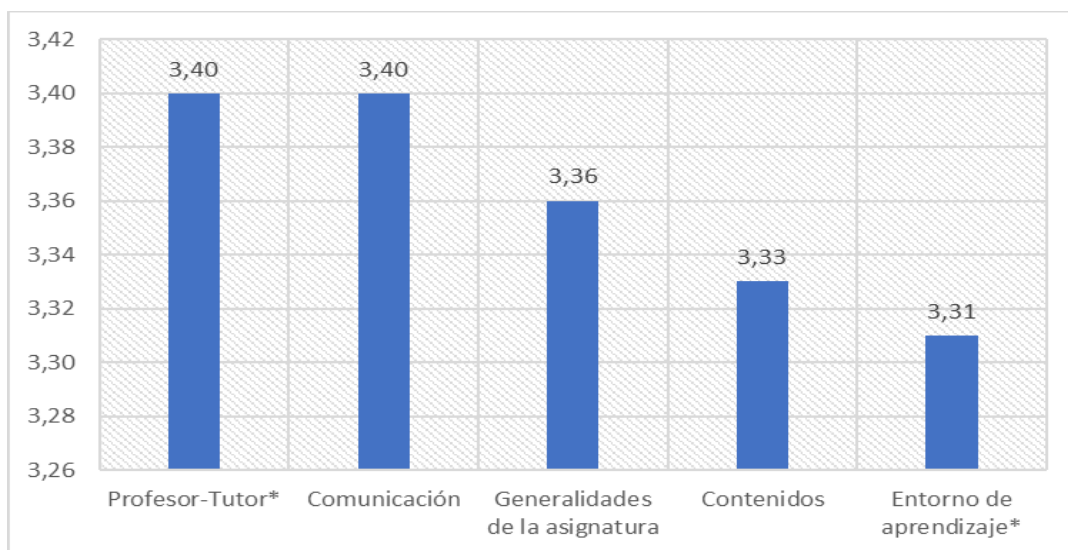


Figura 2. Satisfacción del estudiante con la modalidad semipresencial en sus dimensiones.

When comparing the means of the questions integrated into the instrument, it was found that the item “The teacher-tutor demonstrated mastery of the topics covered in the course” of the dimension Aspects Related to the teacher-tutor obtained the highest mean with a 3.49 (SD: 0.58), while the item “The contents presented in the course have been easy to understand” of the Aspects Related to the Course Contents dimension obtained the lowest mean with 3.13 (SD: 0.58). 0.71). In all cases, the scores were above 3 points, out of 4 possible points on the scale, with satisfaction being categorized as high in all aspects evaluated.

When performing the inferential analysis, a positive correlation was identified between age and the level of satisfaction (ρ : 0.22, p : 0.002), and statistically significant differences were detected in the comparison of the average satisfaction with respect to the career variables, quality of the internet connection (connectivity) and teaching location. In this regard, Health Services Administration students presented lower values in the dimension Aspects Related to the Virtual Learning Environment; The students who evaluated their Internet connection as good and stable obtained higher averages in all the dimensions evaluated (p : <0.001) and those enrolled in the Center campus of the Faculty of Health Sciences presented higher averages in three of the dimensions analyzed and in the overall satisfaction value (p : 0.007).

4. Discussion

The integration of the blended modality in the health sciences curricula has represented various challenges for the management and teaching teams, given the concern that the objectives proposed by the training regarding knowledge, skills and attitudes will not be achieved. compared to traditional modalities of education. Various studies have been carried out whose purpose has been to investigate the impact of the blended modality on the acquisition of skills in health sciences students ranging from the interpretation of 12-lead electrocardiogram (15) to the knowledge of radiological anatomy. (16), which have shown the effectiveness (usefulness) of this modality.

Educational research has shown to contribute positively to professional growth and the improvement of the activities carried out by teachers (17), making it necessary to evaluate the changes that are made in order to detect deviations that put educational quality at risk (18). Therefore, studies like this one that analyze the degree of equivalence of qualifications in various training modalities and the satisfaction of students with them, are not only relevant, but necessary and can serve as input for institutions with concerns in these areas.

As mentioned, there has been growing interest in academic management and teaching regarding the variation of qualifications by introducing new training strategies that differ from the traditional standard format. Some studies have mentioned increases or decreases in grades, mainly linked to a lower degree of knowledge appropriation or, on the contrary, to deficient evaluation processes mediated by technology (19). In our study we set out to analyze the variations in grades in three academic periods, finding a similarity in the overall average of grades, with slight variations detected in three of the majors analyzed. Regarding the latter, the results detected are similar to those reported by Spector et al., (19) who found variations in the grades of partial exams when comparing the grades obtained by students in the face-to-face and virtual modality, although it is highlighted, that in this work virtual evaluation activities were implemented in which there was a high risk of copying by the students, while, in our case, no or low variations in the grades were identified because the evaluation activities were developed in a in person, limiting the risk of copying occurring.

On the other hand, when analyzing student satisfaction with the blended modality, various variables have been mentioned that may influence this aspect; Among them is the learning environment or campus (18). The simplicity, usability and usefulness perceived by students of the learning environment is a relevant aspect since it affects the degree of adaptation and participation in the activities designed and implemented by teachers. It is important to highlight the need for teachers to be prepared for the proper use of the campus so that they can design activities that are motivating and that are well received by students. Some works have highlighted that the learning environment is one of the

institutional factors that most influence the performance and degree of integration of students with blended learning (18), and in our work this aspect was evaluated positively by the respondents, which It may be linked to the mandatory training of the teaching staff for the use of the tools provided by the institution and the monitoring by the educational guidance unit.

On the other hand, it has been mentioned that teaching support is another important factor when analyzing student satisfaction and the level of knowledge appropriation (20-21). In the results of our study, higher averages were identified in the satisfaction of students who positively perceived the level of support provided by the teacher, related to activities such as obtaining constant and timely feedback, the perception of the evaluation format as objective and coherent, providing respectful and informed feedback, as well as stimulating collaborative work. This finding coincides with what was reported by Duque, Rodríguez & Vallejo (22) in their study, who mention that adequate teaching support allows the student to identify their deficient areas in order to manage them, and achieve the degree of appropriation of knowledge and skills required.

It is important to evaluate the students' assessment of the modality, given that, according to various works, their perception can influence their performance. In the present study, high satisfaction was found, especially in aspects related to the teacher such as his mastery of the topics addressed. This aspect is considered crucial for the success of blended education, given that the teacher as an expert must design and implement activities that promote student learning and autonomy, at the same time, that are attractive (23-25).

Personal variables have also been shown to influence satisfaction with the blended modality, including age, having children, the quality of the Internet connection, and expectations and beliefs about the modality, which are often referred to in the bibliography (12,19). In our work, younger students who reported a good internet connection obtained higher average satisfaction scores, related to affinity with technology and the possibility of meeting academic obligations. According to the National Institute of Statistics and Censuses of the Argentine Republic (INDEC), during the year 2022, 62.9% of the country's households had access to a computer, 92.1% had access to the internet and 88.4% of people used the internet (26); This data is relevant given that to guarantee quality education mediated by ICTs, it is essential to have devices and Internet access at home, and in 100% of the cases our students had devices such as computers or electronic tablets, which which facilitates participation in classes and compliance with academic obligations.

The present study shows a high level of satisfaction with blended training in the students of the Faculty of Health Sciences of our institution, and an equivalence in terms of the grades obtained in blended learning when compared to the traditional modality (in person). To achieve the above, it is necessary to have teachers willing to learn and who are committed to the learning of their students, as well as having a pedagogical department that trains and monitors the activities implemented.

The present work is relevant due to the scarcity of literature that analyzes the variations in students' grades in the various training modalities, and even more so, taking into account that after the pandemic, students have demanded that a certain degree of training be maintained. mediated by technology, the concern of teachers and administrators being that the curricular objectives are not achieved. Likewise, the analysis of the students' perception and satisfaction with the subject, its contents, the teacher and the campus are relevant aspects given their impact on the achievement of the intended competencies.

Limitations

As a limitation of this study, the fact that it was carried out in a private higher education institution stands out; Likewise, the surveys administered to the students were answered voluntarily. These aspects may affect the representativeness of the findings. The difficulty in making comparisons with similar studies is also highlighted, given the limited bibliography, the particularities of the institutions, the diversity of instruments and compared aspects.

5. Conclusions

- When comparing the grades of the partial exams obtained under the face-to-face and semi-face-to-face modalities of the subjects of the Faculty of Health Sciences, it was found that these were equivalent with averages that ranged between 6.49 and 6.60 in the periods analyzed.
- The degree of student satisfaction with blended teaching was high, mainly in the dimensions aspects related to the teacher-tutor and communication with averages of 3.40 out of 4.00.
- It was identified that the degree of satisfaction was related to age, the quality of the Internet connection at home and the location where the students attended.

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