

Correlational study of the impact and adaptation of virtual education among university students

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Abstract

The present study aims to establish the existent relationship between the implementation of virtual education and the adaptive process of students from two universities: a public one and a private one. Design: non-experimental, correlational and longitudinal. Method: survey. Instrument: quiz. A 104 students sample divided proportionally divided by each university. Students from both universities presented a significant correlation related to the difficulty that meant coordinating with their work team, which was exacerbated by the feeling of not receiving the correct information for their training.

Keywords: Adaptation, pandemic, university, virtual education.

1. Introduction

The current global health situation has led to a shift in customs, ways of living and learning in the world. Clearly, this unprecedented fact demanded a change at all levels, which highlighted social, cultural and economic inequalities, therefore, access to computer tools [1]. Given this, the education sector has had to transform the face-to-face educational orientation towards a virtual one, and transfigure the teaching methodology.

In [2] this new educational context broadens the teaching-learning perspectives and frames a new field in implementation of teacher-student communication tools for the exchange of knowledge [3]. This has generated the temporary displacement of face-to face education to a larger area, virtual education, through the use of virtual platforms and computer media [4].

In this perspective, a large part of the universities is leading the revolution in the educational system. For [5] this implies a great challenge, since many university teachers resist change and intend to continue with the traditional educational model. However, the implementation and management of Information and Communication Technologies (ICTs) have great potential in improving the quality of learning of university students [6].

The present study aims to establish the relationship between the implementation of the new virtual learning system, through the use of online platforms, and the adaptive process of university students from a private university (San Ignacio de Loyola University-USIL) and a public one (La Molina National Agrarian University-UNALM).

2. Methodology

The research design was non-experimental, quantitative, correlational, and descriptive. The methods used were a survey and a quiz (prepared using Google Forms) was used as an instrument. The population was made

Correlational study of the impact and adaptation of virtual education among university students

up of students from the La Molina National Agrarian University (UNALM) and the San Ignacio de Loyola University (USIL). The sample was 104 students divided proportionally between the two universities. The survey comprised demographic information and 13 polarized YES or NO response questions (See Table I). Each survey was sent in a virtual format and, taking into account the measures taken by the pandemic, using different measures such as email, student groups on social networks and the institutional platform of each university. The study was conducted from October 7, 2020 to February 17, 2021.

Table I. Questions to measure the level of adaption to virtual learning in university students.

Pregunta
1. The information provided virtually by my educational institution is useful for my learning
2. I find it difficult to meet the high demands of my school regarding the use of communication technologies
3. My current skills in using the platforms are insufficient to implement the instructions of the teachers
4. My university does not provide me with enough ease or support to access virtual platforms
5. My educational institution does not promote the use and management of innovative tools for virtual classes
6. I find it difficult to adapt to the new virtual learning methodology
7. The use of virtual platforms improves the quality of my work and learning
8. Virtual classes allow me to perform my student tasks comfortably
9. I consider that I have the technological resources (computer, cellphone, internet, etc.) to continue my studies virtually
10. I consider that the academic material and virtual evaluations are adequate for my educational training
11. Communication through virtual platforms and electronic media between teachers and students is efficient
12. I consider that virtual classes are not productive for my educational training
13. It is difficult for me to coordinate and carry out teamwork through virtual platforms

3. Data Analysis And Processing

Once all the necessary information had been collected, the responses were coded as follows: No=1, Yes=2, in order to be able to carry the corresponding statistical tests. The degree of association between each pair of questions, of the 13 made to the students, was determined using a Spearman correlation matrix. The Spearman correlation coefficient was used because the responses were dichotomous, which made it impossible for them to meet the assumptions of normality [7]. For this, the hypothesis used was the following:

- $H_0: \rho = 0$ There are no statistically significant correlations between the two variables.
- $H_1: \rho \neq 0$ The correlation is statistically significant between the two variables.

On the other hand, the degree of association between each pair of variables was also subjected to a bilateral significance test [8], which made it possible to determine whether the two variables were statistically related ($p < 0.05$). Statistical analyzes were performed using the IBM®-SPSS® version 23 statistical program and the Microsoft Excel spreadsheet.

4. Results And Discussion

Table II shows the 78 values of the Spearman correlation coefficient resulting from the paired comparison of the responses provided by the students of the private university. It can be seen that only eight values of the Spearman coefficient (10% of the total) represent statistically significant correlations (values further away from 0). Of these, four pairs of questions have positive correlations (P1-P10; P2-P13; P6-P12; P12-P13), while the remaining four pairs of questions have negative correlations (P1-P6; P2-P9; P3-P10; P8-P9).

Table II. Level of association between each pair of variables, based on the responses of the private university students.

R	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13
P1	-												
P2	-0.15	-											
P3	-0.09	0.10	-										
P4	-0.11	0.11	-0.13	-									
P5	0.07	0.17	0.07	0.01	-								
P6	-0.34	0.19	-0.15	0.09	-0.08	-							
P7	0.03	0.27	-0.07	0.04	0.26	0.01	-						
P8	0.02	0.23	-0.01	-0.15	0.14	0.17	0.13	-					
P9	-0.07	-0.40	-0.04	0.00	-0.10	-0.06	-0.09	-0.33	-				
P10	0.45	0.07	-0.30	-0.05	0.02	-0.02	0.15	0.01	-0.26	-			
P11	-0.14	-0.14	-0.07	0.25	-0.27	0.10	0.03	-0.12	0.06	-0.11	-		
P12	-0.01	0.15	-0.04	-0.10	0.19	0.41	0.05	0.21	-0.18	-0.04	-0.26	-	
P13	-0.07	0.31	0.02	0.08	0.16	0.16	0.14	0.11	-0.20	-0.02	-0.25	0.37	-

Values in bold represent statistically significant correlations ($p < 0.05$) (two-sided significance).

Regarding the analysis in table II, the results show a moderate probability that as the information provided to private university students improves (P1), the adaptive process to virtual education will improve (P6). Also, as their skills improve in the use of virtual platforms (P3), it may be reflected in a higher level of acceptance of educational material and evaluations (P10). According to [9] and [10] it is very important to know what and how information is transmitted from teacher to student, since this will facilitate online teaching as a new pedagogical method and, therefore, will promote better interaction and acceptance of it.

In the same line of ideas, the fact that they respond positively to the use of technology as expected by the institution (P2), is synonymous with having greater access to technological resources (P9) and, therefore, better coordination with their team working (P13). However, this does not imply that they are necessarily comfortable with this new way of learning (P8). In that sense, for [11], virtual education has caused a rapid transition from classroom to virtual classes, so it is necessary to break down the walls of the traditional and allow greater teacher-student interaction. Likewise, it is not enough for students to have only technological resources for effective learning, but it is also necessary for the teachers to have digital literacy [12]. This will achieve a greater approach to the use of multimedia resources by students and teachers.

On the other hand, regarding the perception of the surveyed students of the private university, it was possible to show that there is a positive correlation between the difficulty of adapting students to the new virtual learning

Correlational study of the impact and adaptation of virtual education among university students

methodology (P6) and their perception on the productivity of virtual classes for their professional training (P12). This correlation was also reported in the research development by [13], in which it was detected that the sudden adoption of the virtual modality and the difficulties that it brought with it triggered in university students a feeling of uncertainty and insecurity about the acquisition of skills necessary for full professional development. To counteract the feelings of insecurity in students, [14] suggests that it is necessary to have teachers who have an adequate performance in digital environments, so that they can guide students in the learning process.

Additionally, it was found that the students' perception of the usefulness of virtual classes for their professional training (P12) also has a positive correlation with the difficulty of coordinating and carrying out teamwork through virtual platforms (P13). In this regard, [15] affirms that teamwork to achieve a common goal has a close impact on the professional development of students, for collaborative learning is immersed in the theory of social constructivism proposed by Vygotsky ([16],[17]); that is, the interaction between individuals (students) is an enriching source of knowledge [18]. Therefore, from this perspective, it is understandable that students consider that difficulties in socializing with their peers are not promoting an adequate professional training.

Similarly, it can be observed that the availability of technological resources to carry out the sessions virtually (P9) has a negative correlation with the comfort that students have to carry out virtual classes (P8). Indeed, at present, and more strongly during the pandemic, digital technologies have become strategic resources to stimulate training management in higher education and contribute to student learning [15], [19]. Studies by [20], [21] revealed that the most essential resource during the pandemic was access to stable internet connections. In such a way that, if students have limited access to this technological resource, they will not be able to have a good educational experience, which will lead to a negative perception of this educational modality.

On the other hand, regarding the responses of the public university students, Table III also shows the 78 Spearman correlation coefficients resulting from the comparison of each pair of questions answered by the students. In this case, it can be observed that 12 values (15% of the total) of the Spearman coefficient (only those values farther from 0 have been considered) have statistically significant bilateral correlations ($p < 0.05$). Of the total of these correlations, it is observed that only five pairs of question have a positive correlation (P2-P6; P2-P13; P4-P5; P6-P13; P12-P13), while seven pairs of questions have negative correlations (P1-P12; P1-P13; P2-P10; P6-P8; P8-P12; P9-P10; P11-P12).

Table III. Level of association between each pair of variables, based on the responses of the public university students.

R	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13
P1	-												
P2	-0.27	-											
P3	-0.11	0.04	-										
P4	0.01	0.01	0.08	-									
P5	-0.25	-0.08	0.18	0.32	-								
P6	-0.14	0.48	0.11	-0.10	-0.04	-							
P7	0.19	-0.10	0.13	0.13	0.00	-0.12	-						
P8	0.25	-0.08	0.09	0.08	0.08	-0.27	0.08	-					
P9	0.20	-0.01	-0.13	-0.04	-0.07	0.00	-0.21	0.07	-				
P10	0.15	-0.30	-0.06	0.26	0.24	-0.17	0.16	0.24	-0.28	-			
P11	0.16	0.05	0.08	0.20	0.09	0.12	0.25	0.17	0.20	0.14	-		
P12	-0.29	0.12	0.19	-0.03	0.08	0.15	-0.19	-0.31	-0.02	-0.20	-0.36	-	
P13	-0.31	0.47	0.03	-0.17	-0.04	0.42	-0.16	-0.12	-0.16	-0.17	-0.25	0.33	-

Values in bold represent statistically significant correlations at the 0.05 level (two-sided significance).

From these data it can be deduced that public university students express that, as virtual classes are more didactic for their training (P12), they will feel more comfortable in this new educational context (P8). Regarding this, [22] indicates that teachers should not teach classes in a static way due to the fact of being virtual, but should share friendly content in order to capture the attention of the students and improve their comfort level [23]. The aforementioned confirms what was expressed by the students, since they consider it important that the university provide useful information for their learning (P1), which indirectly leads to effective communication with their work team (P13). It also leads to the achievement of the objectives on the use of communication technologies proposed by the university (P2).

In this same perspective, students also highlight the need to promote and provide the necessary facilities for the use of virtual platforms (P4) through different didactic tools (P5). In this sense, [24] affirms that it is crucial

that these tools are provided based on the different learning styles of the students, as well as the evaluation design gets improved for a greater participation of them. In this way, by offering them a range of ways of learning, cognitive autonomy will be promoted [2],[4]. The consideration of all these aspects in this new context of virtual education will lead to improve the role of the teacher in the learning of the university student.

In the case of questions related to students' difficulties in adapting to the new virtual learning modality (P6) and their negative perception of the usefulness of virtual classes for their professional training (P12), a positive correlation is shown with the difficulties that students have to develop teamwork through virtual platforms (P13).

On this point, as in the case of the private university, it is necessary to emphasize that teamwork has direct effects on the professional development of students [15]. On the other hand, [25] and [26] argue that for university students the low development of competencies such as self-regulation and autonomous learning are hindering their development in virtual environments. In relation to the above, it is necessary to strengthen their skills in the use of virtual platforms to improve the efficiency in learning.

In addition, the questions referring to the students' feeling of comfort regarding virtual classes (P8) and adequate communication between teachers and students through virtual platforms (P11) have a negative correlation with the pessimistic perception of students on the convenience of virtual classes for their professional training (P12). These results agree with the evidence found by [27] and [28] where it was determined that students who had non-improvised communication with their teachers, that is, with rapid absolutions of student concerns and adequate feedback on the programmed tasks, they considered that virtual classes are no less advantageous than face-to-face classes.

Finally, if a comparison of tables II and III is made, so that the pairs of questions that have similar correlations in both universities can be identified, it can be seen that only two pairs of questions have significant statistical correlations (P2-P13; P12-P13), and in this case, both are positive.

5. Conclusions

The emergence of a virtual educational methodology as a new way of learning in the current health situation has led to a change in paradigms, both in students and teachers with a view to improving educational quality.

A greater number of statistically significant correlations were detected in the answers provided by the students of the public university. This suggests that, in the case of the public university, there are many more variables that must be analyzed together to have a more accurate picture about the quality of education perceived by students.

The responses of the students from the private university had a higher number of significant correlations with the questions related to the quality of the received educational material and the difficulty represented by coordinating with their peers to carry out teamwork.

In both public and private universities, a greater number of significant correlations were related to the difficulty represented by the coordination between students to develop teamwork. This suggests that communication between students suffered a disruptive effect during the development virtual classes.

For students from both types of universities, the feeling of not receiving adequate training for their professional development was exacerbated by communication difficulties between students and the high demands of educational centers regarding the use of information technologies.

Finally, it is recommended to carry out more research both for students from public and private institutions, in order to obtain a greater number of data and thus keep the information on this topic updated.

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