

Moodle platform and Zoom videoconference: learning skills in the virtual modality

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ABSTRACT

In Peruvian Universities, most of the Moodle platforms and the Zoom videoconference were used in virtual teaching-learning. The teachers and students of the University of Sciences and Humanities, which is the object of study, used these tools in the class session. Moodle and Zoom complement each other for virtual classes during the pandemic time. The objective of the research is the influence of Zoom and Moodle on learning skills. The methodological design of the research has correlational scope, quantitative, non-experimental approach of cross-section. A survey was conducted of 95 students from the first cycles of the university. The instrument was validated by expert judgments with 86.3% approval. In addition, reliability was performed with Cronbach's Alpha, obtaining the value of 0.875. A p-value of 0000 was obtained as a result and the degree of correlation between Moodle and learning skills was 0.438** and Zoom with learning skills was 0.519**; determining in this way that there is a moderate positive significant correlation. It is concluded that the development of learning skills that correspond to digital skills, the communicative and cognitive part is due to the use of the Moodle platform and the Zoom videoconference in the learning sessions.

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1. INTRODUCTION

In the international context, the educational community generally uses technological tools and resources such as the Zoom videoconference and the Moodle platform, among others [1]. These tools interact in the teaching-learning process. In this sense, Agusriandi *et al.* [2] determine that Zoom and Moodle allowed a collaborative and interactive class between teachers and students. In addition, the use of the Moodle platform is an learning management system (LMS) [3], [4], which allows the integration of all the contents to be able to carry out the classes with the students. Ukrainian Universities implemented the use of Moodle and Zoom platforms [5], to continue their studies remotely, since 82% are at home, as a result of the pandemic.

The new scenario generated by the 2020 pandemic in Peru, in the educational sector, accelerated the use and learning of new techniques for the teaching-learning process in virtual environments for both students and teachers. As well as unlearn behaviors and habits of face-to-face teaching. Currently, at the University of Sciences and Humanities (UCH), which is the study the research, teachers, and students were trained in the use of Zoom and Moodle; since the problems in its use were detected and identified. The problem was generally that the student did not know how to upload files in Moodle of the tasks that the teachers left them, as well as the correct use of Zoom. The training was carried out at first for newly incorporated teachers; as well as teachers

with experience in the use of tools at a more advanced level. Likewise, training was developed for incoming students of the first cycle of study, before the start of class. Thus, in this, the way they overcome the difficulties in managing the use of Moodle and Zoom [6]. The most sensitive limitations were identified through the surveys. These limitations were addressed through a training plan to reduce the negative impact. The main limitations identified in Zoom were the lack of importance of security measures and minimal knowledge of the use of the recurring meeting. There was also difficulty in using the meeting host, the waiting room, the meeting key, use the class session for 40 minutes, this is because the teachers used the free version. Besides, it was supported with the use of a laptop, with technologically limited students, including internet access.

On the other hand, Zoom and Moodle support the development of students' learning skills in their class sessions [7]. These mediums are tools for the advancement of their communicative, cognitive, and digital skills. That is why the importance of conducting research analyzing how both Zoom and Moodle are related to learning skills. The scope of the research was only a study of Zoom and Moodle in their relationship with learning skills; since they are aligned with the strategic objectives of the university under study. In this way, video conferences such as Jitsi, Meet and platforms such as Canvas, and Chamilo, among others, were excluded. The objective of the research is to relate the influence of the use of the Moodle platform and the Zoom videoconference on the learning skills of UCH students in times of Pandemic. The research is structured by: in section 2 the introduction was made; in section 3 the methodology was carried out, where the research design is carried out; in section 4 the results were made; also, in section 5 the discussions, in section 6 the conclusions.

2. LITERATURE REVIEW

The study research requires a review of the literature. This review was based on a theoretical basis, which allows explaining the variables under study. Likewise, related work was carried out that allows finding studies similar to the investigation, in order to contrast their findings, and their conclusions, among others. In this sense, there is a holistic offer for the development of research.

2.1. Theoretical basis

2.1.1. Moodle platform

The Moodle platform manages files such as documents, videos, links, and forums, among others, interactively between teachers and students. In that sense, Mpungose [8] states that one of the characteristics of Moodle is the interaction between teacher and student. It also states that the management of student learning is optimal because it allows them to strengthen their cognitive, communicative, and digital skills. Moodle is an open-source LMS that allows you to create online blended courses, where the class can be delivered asynchronously and synchronously. Likewise, for the use of the Moodle platform, the use of the internet is required for its operation [9]. It also has a very friendly interface for end users who are students and teachers.

2.1.2. Zoom videoconference

The Zoom videoconference has an internal structure that allows one or more people to interact through messaging, visual communication, and group work. This allows for taking into consideration one of the essential factors in the teaching-learning process. In addition, it helps permanent and efficient communication in class sessions [10]. Considering this feature of Zoom, students can make their own recorded videos, either to introduce themselves or to support a task, as well as carry out group work with their classmates. This allows you to do your tasks in a simple and fast way [11]. Also, they can meet in subgroups to develop a discussion of a specific topic that the teacher proposes. This functionality ensures that all students can participate in the class and generate their self-learning, developing their general and specific skills [12]. Both teachers and students with little experience in the use of technologies can access a Zoom meeting by creating an account on the platform and selecting options between the free and paid versions. It does not require sophisticated configuration or additional implementations, it works on laptops, computers, tablets, and mobile devices.

2.1.3. Learning skills

In the knowledge society, it is important that students develop their learning skills and that they generate autonomous learning. In the globalized world, information is in constant renewal and expiration. The degree of autonomy that the student has will allow them to be current and have better opportunities in this competitive world. Likewise, students in their class sessions interact with technological tools in a visual, collaborative way [13], and thus in this way, they develop their digital skills. In addition, autonomous learning, inscribed in a society with rapid changes in the social, professional, and technological spheres, in turn, develops continuous learning. Taking into account these skills as support, organizing, planning skills, self-assessment skills, and collaborative learning skills, strengthening the skills and profiles expected in educational programs.

On the other hand, communication skills are developed in class sessions [14], with discussion forums and instant messaging, providing a space for discussion with peers and teachers.

2.2. Related work

In UCH, a study was carried out on the use of Zoom videoconferencing, and the Moodle platform [15]. Based on this, training was proposed for teachers of the systems engineering program. The survey was made to 51 students and 19 teachers. Obtaining as a result that the students show their satisfaction in the surveys with a support of 60 % on the adequate use of their teachers, culminating the training.

In the teaching-learning process in university education, the use of Moodle had a positive impact on the development of tasks by students and their interaction with their peers [16]. Likewise, a study conducted at the University of Dar es Salaam by Cycon *et al.* [17]. Analyzed different videoconferences and educational platforms to be able to implement in teaching-learning; where its objective was to systematize the different tools that they can offer their students for quality teaching. In their findings, they found that zoom and Moodle were the most suitable for their implementation due to their integration, their collaborative communication, and their security. The satisfaction with the use of educational platforms such as Moodle and the Zoom videoconference in educational entities was carried out by Sumarwati *et al.* [18], where the purpose of his research was to explore the frequency in the use of the educational tools mentioned in the teaching-learning. In that sense, they were surveyed to know their frequency of use of them; having, as a result, the use of the different platforms that users have used, 43% use Moodle most frequently in the first place, and the other platforms less frequently and with respect concerning Zoom videoconferencing, 28,2% use it more frequently, occupying second place compared to the others, where WhatsApp ranks first. place with 41,7%.

Moreover, Joseph *et al.* [19] describe the problem of online education in a higher technical school, where there are inequalities in the use of technological tools such as Moodle. In this study, the design of the methodology was a quantitative approach through the survey technique and a questionnaire that measures the perception of 137 students and 20 teachers. The results obtained were in favor of Moodle, where its accessibility generates autonomous learning. What's more, it has elements that can be used additionally, being compatible with other software and its applications. But the disadvantage is that its interface requires prior learning.

In another study, Martinez *et al.* [20] investigated educational platforms such as Edmodo, and Moodle; analyzing their influence on the teaching-learning processes. In said study, the design of the methodology is of a qualitative approach, using two research techniques, content analysis, and in-depth interview, for the study of platforms such as Moodle and Edmodo. The results obtained indicate that the Moodle educational platform requires management and planning. In addition, teachers state that it is stressful. For students who join the university adaptation, it is not easy to adapt to it, and they are different tools to social networks. Likewise, educational platforms must be adequately prepared, so that they are not a demotivating factor.

Also, Zabolotniaia *et al.* [21] analyze if Moodle is an educational, challenging, and innovative platform in higher education. They state that it covers and satisfies the quality conditions in the educational and administrative development of the university. Approaching face-to-face processes, and developing both hard skills and soft skills in future professionals. The design of the methodology carried out was qualitative research, which is aimed at measuring the perception of both teachers and students through a survey. Whose results conclude the implementation of distance education based on the Moodle platform; guaranteeing an effective digital transformation in higher education. In addition, the Moodle platform has a comparative advantage, since it allows continuous and complete learning, in the monitoring, follow-up, and evaluation of the quality of knowledge, with the aim of achieving a comprehensive education.

Besides, Serhan [22] in his article establishes that in the first academic period of 2020, education went through a transition stage from face-to-face sessions to virtuality, using the Zoom tool due to a health emergency world. At that time, inequalities and access to quality education emerged. In a survey of 31 students from a university in the United States, it was concluded that there was great dissatisfaction with their learning in this transition period at this stage since universities and teachers were not prepared. Some of the limitations of zoom arose in psychomotricity or laboratory courses, such as managing interaction with other students on Zoom. Also, the students turn off the cameras in whole sessions, among others, with which the presence of the student cannot be known. Therefore, to overcome these difficulties, continuous training was carried out, thus managing to overcome these problems.

Likewise, Stefanile [23] establishes in her research that the transition process, when moving from face-to-face classes to Zoom, initially had adaptation limitations for both the educational organizations and the student, but as time they adjusted and improved pedagogical skills and strategies. The role of Zoom has a good effect on learning when the number of participating students is not exaggerated. The use of Zoom is part of the new paradigms that have been generated in the pandemic, for example, in classes, where not only the student participates, but also the family environment to support or monitor the sessions. According to Alfadda and Mahdi [24], in their research work on the correlation of tools such as Zoom and the educational platform with

the student’s abilities, they obtained significant low results of 0.28** and moderate significant positive results. 0.49** on average. This study was carried out with the different factors associated with Zoom videoconferencing tools and the educational platform.

In synthesis, the work carried out by the different authors revealed limitations, such as the few studies on the development of learning skills in Moodle and Zoom. In addition, gaps were found, in not being clearly and precisely defined, the monitoring processes in the development of learning skills with the use of digital tools. These limitations and gaps found allow us to carry out a study in our research work to analyze the correlation between Moodle, Zoom, and learning skills.

3. METHOD

3.1. Investigation method

The research work has a quantitative approach, non-experimental design, descriptive, correlational, and cross-sectional scope [25]. The object of study is the UCH and its unit of analysis is the students of the first cycle. The population is made up of 180 students from the first semester. The sample was non-probabilistic, intentional of 95 students. The survey technique and the questionnaire instrument were used. This survey was conducted with the google form. The questionnaire was structured in two sections. The first section with sociodemographic questions and the second section with 26 questions on the Moodle Platform variables, the Zoom videoconference, and learning skills. These questions were placed with Likert scale options in ordinal form, with 5 levels, where 1 indicates never, 2 almost never, 3 sometimes, 4 almost always, and 5 always.

For the validation of the instrument, expert judgment was applied. Where 3 experts were selected in the study research line; one pedagogue and two in technology. The experts analyzed what was done a shown in Figure 1. The variables Zoom, Moodle, and learning skills are located in this; as well as the dimensions, indicators, and items. In this way, it allows experts to have a holistic view to carry out content and construct validation. In addition, Table 1 was taken into account for the assessment by the experts.

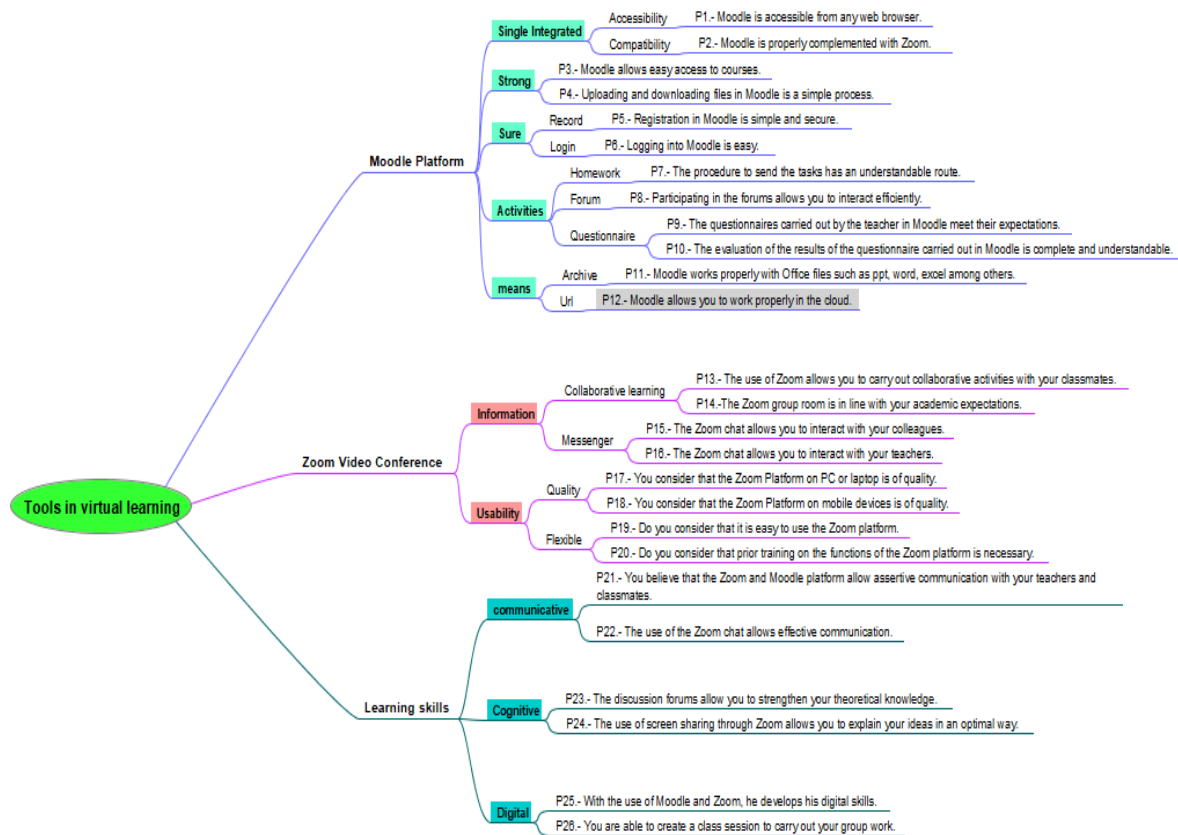


Figure 1. Research dimensions and indicators

Table 1. Values for expert judgment

N	interval in %	Scale
1	[0;20[Very poor
2	[20;40[Deficient
3	[40;60[Regular
4	[60;80[Good
5	[80;100]	Very good

3.2. Development of the method

3.2.1. Analysis

Stakeholders-all those involved are identified: students, teachers, webmaster, and coordinator problem tree-a study was carried out using the problem tree, which made it possible to analyze the main causes, as well as the central problem and its consequences, as shown in Table 2. The central problem was that the students of the university under study were not trained in the use of technological tools such as Zoom, and Moodle that they use in their class sessions. In addition, their learning skills in virtual education at the beginning were limited. Where the digital skills of the students, in communication and cognitive, had problems when they began to use Moodle and Zoom in-class sessions.

Table 2. Problem tree

N	Causes	Consequences
1	Social isolation	There are no face-to-face classes
2	Little use of tools technological	Limitations on virtual classes
3		Inadequate teaching.
4	Little experience in virtual classes	Absence of classes.

3.2.2. Design

It was carried out through a flowchart, the interaction of the use of the Moodle platform, and the Zoom video conference, from the beginning to the end. It consists of three stages, in the first one the beginning was made, where the web master prepares or restores all the courses of the previous cycle; then in the development, the interrelation of the teacher and the student is observed through the Moodle platform and zoom. Finally, the teacher uploads the recording of the class session. The flowchart was made with the use of a tool that diagrams processes, called Bizagi, which works with activities, tasks, and lanes (see Figure 2).

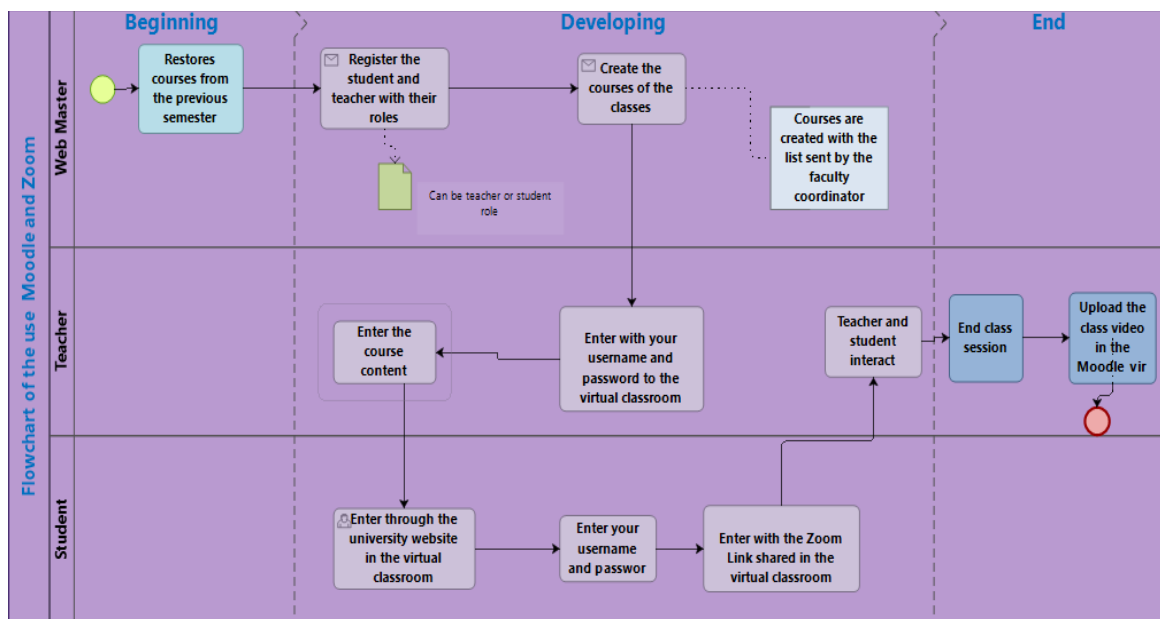


Figure 2. Flowchart of the process of using Zoom and Moodle

3.3. Correlational research hypothesis

The correlational hypothesis of the research is formulated (see Figure 3), between the Zoom variables and the Moodle platform, which influences the learning skills variable and its factors. Variables 1 and 2 are input variables are the Moodle and Zoom variables, respectively, and variable 3 is the learning skills output variable. In addition, the correlation of these variables and their factors is analyzed.

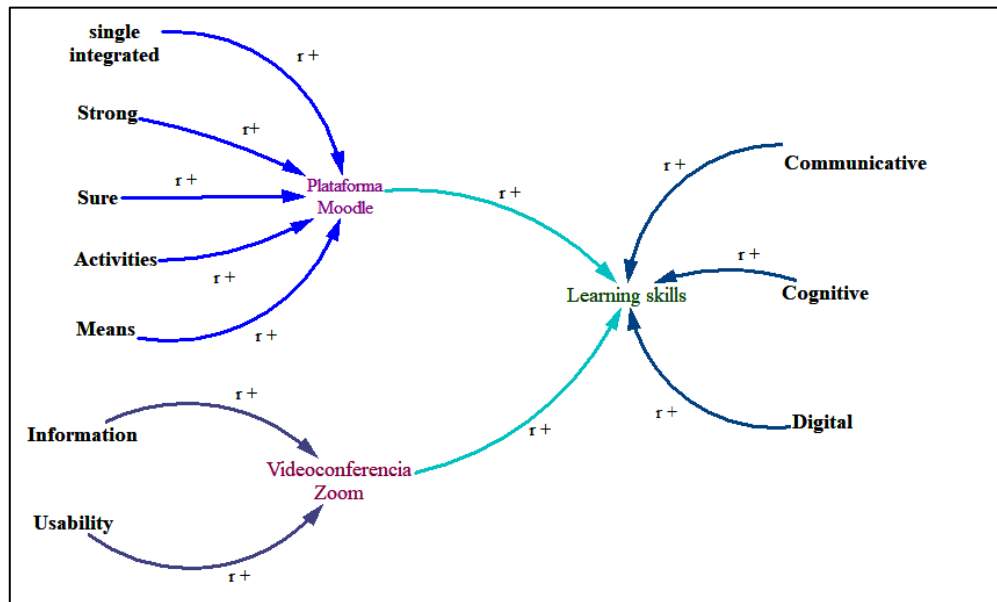


Figure 3. Hypothetical correlational model

4. RESULT

4.1. Instrument validation and reliability

4.1.1. Instrument validation

When performing the validation of the instrument by expert judgment, taking into account the assessment in Table 1, the scores by items were made by the experts. For the validation of the instrument, clarity, coherence, consistency, relevance, and intentionality were considered. Content and construct validity were performed. Regarding the content, it was ensured that the instrument is clear, intentional, and relevant to the variables Zoom, Moodle, and learning skills. Likewise, in construct validation, it is ensured that the study variables with their dimensions, indicators, and items are coherent and consistent [26], [27]. In addition, it supports the validation by Kaiser, Meyer, and Olkin (KMO) with a value of 0.794 that is greater than 0.5, and by the Bartlett sphericity test with a value of 0.000 that is less than 0.05 (see Table 3) [28]. In Table 4, a total average of 86.3% was obtained; with which the instrument is validated since it is greater than 75%.

Table 3. Reliability and validation of the instruments

Cronbach's Alpha	KMO	Bartlett
Reliability	Validation	Validation
It must be greater than or equal to 0.7	It must be greater than or equal to 0.5	It must be p less than 0.05
0.875	0.794	0.000

4.1.2. Instrument reliability

The results obtained, concerning Cronbach's Alpha, was 0.875. In this way, reliability is being fulfilled, having a value greater than 0,70 [29]. In addition, Table 5 shows the analysis of Cronbach's Alpha by items; in the penultimate column can be seen that item 6 has a value of 0,14, which represents 14% and by theory, all the elements in that column should be greater than 20%. As said item did not comply with the test, the correction was made before its execution.

Table 4. Expert judgment

Question	Expert1	Expert2	Expert3	Percent
1	75%	80%	100%	85%
2	90%	85%	85%	86.7%
3	700%	80%	90%	80%
4	90%	95%	85%	90%
5	90%	95%	85%	90%
6	80%	85%	80%	81.7%
7	80%	85%	90%	85%
8	80%	80%	95%	85%
9	90%	95%	80%	88.3%
10	75%	80%	90%	81.7%
11	90%	75%	95%	86.7%
12	95%	90%	80%	88.3%
13	80%	90%	95%	88.3%
14	90%	80%	95%	88.3%
15	75%	85%	95%	85%
16	95%	80%	95%	90%
17	80%	90%	80%	83.3%
18	80%	80%	80%	80%
19	85%	80%	90%	85%
20	75%	85%	80%	80%
21	80%	90%	95%	88.3%
22	85%	95%	95%	91.7%
23	80%	90%	80%	83.3%
24	100%	90%	95%	95%
25	95%	95%	100%	96.7%
26	80%	90%	85%	85%

Table 5. Cronbach's alpha analysis

Questions	Mean scale if the item has been suppressed	Scale variance if the item has been suppressed	Questions	Mean scale if the item has been suppressed
1	111.39	81.96	0.24	0.88
2	111.71	79.49	0.29	0.88
3	111.40	79.75	0.49	0.87
4	111.47	80.30	0.38	0.87
5	111.43	79.12	0.50	0.87
6	111.84	81.90	0.14	0.88
7	111.43	79.01	0.48	0.87
8	111.56	77.55	0.58	0.87
9	111.57	77.80	0.49	0.87
10	111.41	79.52	0.52	0.87
11	111.53	79.66	0.45	0.87
12	111.73	78.31	0.43	0.87
13	111.40	79.14	0.54	0.87
14	111.55	77.14	0.57	0.87
15	111.32	81.20	0.40	0.87
16	111.28	79.75	0.53	0.53
17	111.846	78.93	0.46	0.87
18	112.17	79.12	0.32	0.87
19	111.41	80.90	0.37	0.87
20	112.17	79.76	0.25	0.88
21	111.44	79.53	0.59	0.87
22	111.48	78.13	0.57	0.87
23	111.68	76.62	0.59	0.87
24	111.42	77.18	0.66	0.87
25	111.37	79.30	0.55	0.87
26	111.91	78.30	0.37	0.87

4.2. Descriptive analysis

About the descriptive analysis, the scale was made with the statistical data; where 3 level intervals were placed; such as low, regular, and high levels. Then the Moodle variable was analyzed (see Figure 4), where it can be seen that 88.42% is a high level and 11.58% is average. Also, the Zoom variable (can be seen in Figure 5) is 92.63% high and 7.37 is regular. In addition, for the learning skills variable (see Figure 6) 94.74% is of a high level and 5.26% is of a regular level. Emphasizing that the 3 variables do not have a low level. Moreover, the box and whisker plot was made; where it can be seen that both the male (30.53%) and female (69.47%) students have a median age of approximately 19 years. But also, atypical data were identified; in the case of women, there are 4 who are between 39 and 43 years old, and in the case of men, one is 32 years

old and the other 51 years old. In addition, there is a greater presence of female students in the third quartile than in the second quartile. This is the opposite of the male case, where there is a lower presence of students in the third quartile, compared to the second quartile.

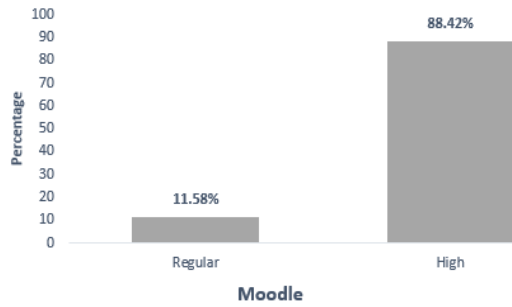


Figure 4. Moodle analysis

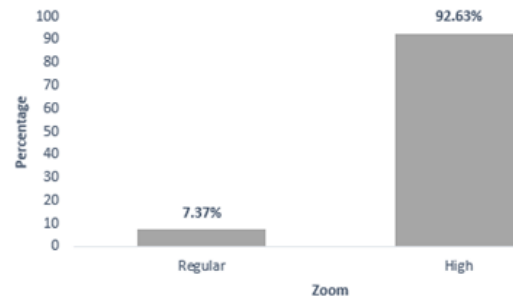


Figure 5. Zoom analysis

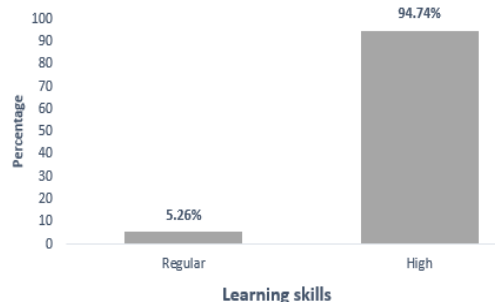


Figure 6. Learning skills analysis

In Table 6 shown, the Moodle factors are described. When analyzing the mean of the 5 factors they tend to be 3; therefore, the mean is above 1.5. It is interpreted that the mean has a high level in all its factors. It is then stated that Moodle factors are highly suitable. Regarding its standard deviation, the minimum value obtained was 0.000 in activities and the maximum value was 0.263 in mean.

Table 6. Moodle factors

Descriptive	Strong	Full	Sure	Activities	Mean
Mean	2.989	2.948	2.948	2.948	2.926
Mean error	0.011	0.023	0.023	0.000	0.027
Median	3.000	3.000	3.000	3.000	3.000
Mode	3.000	3.000	3.000	3.000	3.000
Standard deviation	0.102	0.224	0.224	0.000	0.262
Variance	0,011	0.050	0.050	0.000	0.069
Asymmetry	-9.747	-4.072	-4.072	-3.316	-3.316
Asymmetry error	0.247	0.247	0.247	0.247	0.247
kurtosis	95.000	14.890	14.890	9.190	9.190
kurtosis error	0.490	0.490	0.490	0.490	0.490
Rank	1.000	1.000	1.000	0.000	1.000
Minimum	2.000	2.000	2.000	3.000	2.000
Maximum	3.000	3.000	3.000	3.000	3.000
Sum	284.000	280.000	280.000	285.000	278.000

In Table 7 the zoom factors, such as information and usability [30], [31] average is close to the value of 2.9. It can also be affirmed that it is high since it approaches the maximum value, which is 3. Regarding its standard deviation, the minimum value obtained was 0.202 in information and the maximum value was 0.334 in usability. In Table 8, the learning skills factors, their mean is close to 2.8; it can also be stated that it has a high average. Regarding its standard deviation, the minimum value is 0.28 in communication and the high value is 0.367 in digital.

Table 7. Zoom factors

Descriptive	Information	Usability
Mean	2.958	2.873
Mean error	0.020	0.034
Median	3.000	3.000
Mode	3.000	3.000
Standard deviation	0.202	0.334
Variance	0.041	0.112
Asymmetry	-4.634	-2.286
Asymmetry error	0.247	0.247
kurtosis	19.888	3.295
kurtosis error	0.490	0.490
Rank	1.000	1.000
Minimum	2.000	2.000
Maximum	3.000	3.000
Sum	281.000	273.000

Table 8. Learning skills factors

Descriptive	Cognitive	Communicative	Mean
Mean	2.863	2.842	2.916
Mean error	0.035	0.037	0.029
Median	3.000	3.000	3.000
Mode	3.000	3.000	3.000
Standard deviation	0.346	0.366	0.280
Variance	0.119	0.134	0.078
Asymmetry	-2.147	-1.907	-3.043
Asymmetry error	0.247	0.247	0.247
kurtosis	2.667	1.670	7.414
kurtosis error	0.490	0.490	0.490
Rank	1.000	1.000	1.000
Minimum	2.000	2.000	2.000
Maximum	3.000	3.000	3.000
Sum	272.00	270.000	277.000

4.3. Inferential analysis

4.3.1. Correlation between variables

Generating a result that there is a correlation between Moodle and learning skills with a p-value of 0.000; in the same way, it was obtained that there is a correlation between Zoom and learning skills with a p-value of 0.000; in both cases, it is less than 0.05. The degree of correlation between Moodle and learning skills is 0.438** and that of Zoom with learning skills is 0.519**; in both cases, according to Table 9, it is moderately positive at a 1% margin of error and a 99% probability of certainty.

To carry out the inferential analysis, the types of data under the study of the variables Zoom, Moodle, and learning skills were identified. These variables are ordinal; that is why non-parametric tests were chosen, using Kendall's Tau B in all of them. The correlation between the Moodle, zoom variables with the learning skills variable was made (see Table 10).

The correlation between the Moodle variable and its factors is recognized, with a value of 0.000 being less than 0.05 (bilateral). Likewise, with a 1% probability of error and a 99% probability of certainty. All its factors are correlated in the range of 0.4 and 0.69, that is, the correlation is positive and moderate (see Table 11).

Table 9. The scale of values of the correlation coefficient

Value	Meaning
-1	Large and perfect negative correlation
-0.9 a -0.99	Very high negative correlation
-0.7 a -0.89	High negative correlation
-0.4 a -0.69	Moderate negative correlation
-0.2 a -0.39	Low negative correlation
-0.01 a -0.19	Very low negative correlation
0	Null correlation
0.01 a 0.19	Very low positive correlation
0.2 a 0.39	Low positive correlation.
0.4 a 0.69	Moderate positive correlation
0.7 a 0.89	High positive correlation
0.9 a 0.99	Very high positive correlation
1	Large and perfect positive correlation

Table 10. Relationship between variables

Variables	Moodle	Zoom	Learning skills
Moodle	1.000		
Zoom	0.385**	1.000	
Learning skills	0.438**	0.519**	1.000

Table 11. Correlation between the Moodle variable and its factors

Variables	Moodle	Single Integrated	Strong	Sure	Activities	Means
Moodle	1.000					
Single Integrated	0.551**	1.000				
Strong	0.513**	0.300**	1.000			
Sure	0.473**	0.221**	0.175*	1.000		
Activities	0.657**	0.315**	0.364**	0.243**	1.000	
Means	0.544**	0.280**	0.252**	0.256**	0.360**	1.000

There is a correlation between Zoom and its factors with a 1% probability of error and a 99% probability of certainty, with a significance value of 0.000. The degree of correlation of the Information factor with Zoom is moderately positive with a value of 0.589**. Likewise, the degree of correlation for the usability factor is 0.742**, being highly positive (see Table 12).

Table 12. Correlation between the Zoom variable and its factors

Variables	Zoom	Information	Usability
Zoom	1.000		
Information	0.589**	1.000	
Usability	0.742**	0.213**	1.000

There is a correlation between learning skills and their factors, with a value of 0.000 in all of them, with a level of 0.01 (bilateral), that is, with a 1 % probability of error and a 99% probability of certainty. The communicative part correlates 0.666** with learning skills; According to Table 9, the degree of correlation is moderately positive. In contrast, the correlation with the cognitive factor is 0.725**, with a highly positive degree. In addition, the correlation of the digital factor with learning skills is 0.701** in the degree of high positive (see Table 13).

Table 13. Correlation between Learning skills and its factors

Variables	Learning skills	Communicative	Cognitive	Digital
Learning skills	1.000			
Communicative	0.666**	1.000		
Cognitive	0.725**	0.495**	1.000	

In Table 14, the correlations of the factors of the variables Zoom and Moodle with the learning skills are significant with a margin of error of 1% and certainty of 99%; this is displayed with the 2 asterisks. Regarding the correlation of the Moodle variable with its factors, it is of low and positive degree, except for activities, which is of positive and moderate degree; in the Zoom variable, the degree of correlations is low and moderately positive. It is stated that the factors of Moodle and Zoom with learning abilities are not high.

Table 14. Correlation of factors with learning skills

Moodle and Zoom factors		L. skills	S. Integrated	Strong	Sure	Activities	Means	Information	Usability
L. skills	Correlation coefficient	1.000							
	Sig. (bilateral)								
S. Integrated	Correlation coefficient	0.245**	1.000						
	Sig. (bilateral)	0.003							
Strong	Correlation coefficient	0.293**	0.300**	1.000					
	Sig. (bilateral)	0.000	0.001						
Sure	Correlation coefficient	0.251**	0.221*	0.175*	1.000				
	Sig. (bilateral)	0.002	0.011	0.046					
Activities	Correlation coefficient	0.517**	0.315**	0.364**	0.243**	1.000			
	Sig. (bilateral)	0.000	0.000	0.000	0.004				
Means	Correlation coefficient	0.315**	0.280**	0.252**	0.256**	0.360**	1.000		
	Sig. (bilateral)	0.000	0.001	0.004	0.003	0.000			
Information	Correlation coefficient	0.499**	0.206*	0.305**	0.266**	0.433**	0.309**	1.000	
	Sig. (bilateral)	0.000	0.017	0.000	0.002	0.000	0.000		
Usability	Correlation coefficient	0.396**	0.142	0.233**	0.135	0.218**	0.261**	0.213**	1.000
	Sig. (bilateral)	0.000	0.089	0.006	0.101	0.006	0.002	0.009	

4.3.2. Multiple linear regression

Table 15 shows the predictor variable Moodle, Zoom, and the dependent variable learning skills. In addition, it is observed that the significance value is 0.000, thereby confirming the correlation between both variables since the p-value is less than 0.05. Likewise, it has $R^2=0.585$, which means that 58.5% of the learning skills variable is explained by the predictor variable.

Table 15. Multiple linear regression

Predictor variable: platform Moodle and videoconference Moodle the stress variable	Dependent variable: Learning skills $R^2 = 0.585$		
	Beta	t	Sig.
Moodle	0.316	3.748	0.000
Zoom	0.532	6.311	0.000

5. DISCUSSION

In teaching-learning, there were difficulties in the use of Zoom and Moodle tools, both by teachers and students. The study carried out by Serhan [22], coincides with the results found in the investigation, since they also found difficulty in the use of the Zoom and Moodle tools. For this, they carried out training just like the UCH and thereby improved their services. In the same way, Stefanile [23] reported difficulties in the transition from face-to-face to virtuality in times of pandemic [31].

Also, in the research that was carried out, in the use of the Moodle tool there is a satisfaction with an 88.42% acceptance, in the survey carried out. This is due to the different pieces of training that UCH carried out for its teachers and students periodically. However, study by Sumarwati *et al.* [18], found that 43% use Moodle satisfactorily. This is because at this university they provide other types of tools for the class session and their training was not constant.

Besides, the learning abilities in the study carried out obtained a moderate positive correlation and other low ones. It is justified by the focus on training in the use of technological tools. In addition, it was not taken into account that the didactic and pedagogical methodology was different in virtuality. Keskin *et al.* [13], suggest that collaborative tools allow students to develop their learning skills, as well as their digital skills, obtaining high acceptance. This coincides with the research work that it reports, a 94.74% acceptance rate. A previous study carried out by the UCH, on the technological tools of Moodle and Zoom [15], but did not take into account the variable of learning skills; it was only a descriptive study. Instead, the research study is correlational where the correlation between the variables Zoom and Moodle with the learning skills variable was analyzed.

The research studies the correlation between the Moodle and Zoom variables with the learning skills variable. Having findings that the correlation of Moodle with learning skills was 0.438**, that is, significant, moderate, and positive. and the correlation of Zoom with learning skills is 0.519** which is also moderately positive and significant. A study carried out by Alfadda and Mahdi [24], obtained moderate positive and significant results and other low ones; partially coinciding with the research carried out.

6. CONCLUSION

The correlation between the Moodle variable and the learning skills variable is significant to a moderate and positive degree, that is, the greater the use of the Moodle tools, the greater their learning skills. This is due to the use of discussion forums where they share their knowledge and in turn show their position in the comments of their peers. Likewise, the integrity of files and videos allows the student to develop their digital skills and therefore the development of their learning. On the other hand, the correlation of the Zoom videoconference variable with learning skills is also significantly moderately positive, that is, the greater the use of zoom videoconferences, the more learning skills increase. This is because Zoom allows group and collaborative work. Communication through Zoom and Moodle allows students to learn, generating knowledge most optimally and thus developing their digital skills. In future work, it is suggested that other tools similar to Zoom be investigated, such as Meet, Jitsi, and Teams. In addition, platforms similar to Moodle, such as Canvas, Chamilo, Blackboard, and in communicative part with Telegram, and WhatsApp. Additionally, it is suggested to study the impact of the use of Zoom and Moodle videoconferencing in the modality of hybrid learning environments. Finally, carry out a mixed study, with interviews with students and teachers, so that the qualitative and quantitative can be contrasted. It is recommended to expand the study population to higher education students.

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