SEj
Vol. 5, N° 1, 2021

Journal of Sciences and Engineering

A publication of
CINCADER
Centre of Research and Training for Regional Development
Online at www.journals.cincader.org

ISSN 2523-9503
DOI: https://doi.org/10.32829/sej.v5i1.203

Influence of the virtual teaching modality on the desertion of students from the Computing and Informatics study program in the IESTP Laredo [Influencia de la modalidad de enseñanza virtual en la deserción de los estudiantes del programa de estudios de Computación e Informática en el IESTP Laredo]

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Received: 17 December 2020; Accepted: 21 December 2020; Published: 07 January 2021

Resumen

El presente trabajo de investigación se ha desarrollado con el propósito de evaluar la influencia de la modalidad de enseñanza virtual en la deserción de estudiantes del programa de estudios de Computación e Informática en IESTP Laredo.
Los indicadores utilizados como aprendizaje virtual, sistemas de aprendizaje virtual, unidades didácticas, habilidades terminales, se han utilizado para evaluar el grado de deserción de los estudiantes. La hipótesis se contrastó aplicando el diseño pre-experimental con pre-test y post-test. El resultado obtenido a partir de los coeficientes significativos de los respectivos indicadores de la preprueba fue 0,63; 1, 0,65; 0,78; 1; 0,82; 0,78 y la posprueba fue 0,49; 0,61; 0,32; 0,66; 0,65; 0,58; 0,40. Se pudo determinar que existe una contradicción dentro de cada uno de los indicadores, ya que los resultados muestran que en cada indicador al final del período académico 2020 - I, se obtuvo una menor participación de los estudiantes en el desarrollo del proceso de aprendizaje virtual , lo que conduce a la deserción mediante este tipo de aprendizaje.

Palabras clave: Aprendizaje virtual, moodle, unidad didáctica, capacidad terminal.

Abstract

The present research work has been developed with the purpose of evaluating the influence of the virtual teaching modality in the dropout of students from the study program of Computación e Informática in IESTP Laredo.
The indicators used such as virtual learning, virtual learning systems, didactic units, terminal abilities, have been used to evaluate the degree of student dropout. The hypothesis was contrasted applying the pre-experimental design with pre-test and post-test. The result obtained from the significant coefficients of the respective indicators the pre test was 0,63; 1, 0,65; 0,78; 1; 0,82; 0,78 and the post test was 0,49; 0,61; 0,32; 0,66; 0,65; 0,58; 0,40. It was possible to determine that there is a contradiction within each of the indicators, since the results show that in each indicator at the end of the academic period 2020 - I, a lower participation of students was obtained in the development of the virtual learning process, which leads to dropout using this type of learning.

Keywords: Virtual learning, moodle, didactic unit, terminal capacity.

Please cite this article as: Gómez J., Diaz F., Chávez E., Vega J., E-Learning as a teaching alternative for graduate students in Information Technology Management and Administration at the Universidad Nacional de Trujillo, Journal of Sciences and Engineering, vol. 5, no 1, 2021, pp. 1-8. https://doi.org/10.32829/sej.v5i1.203

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1. Introduction

The IESTP Laredo is a public educational institution that trains technical professionals in 3 study programs, provides an educational service in person from its operation until the 2019 school year, due to the current situation regarding the COVID-19 pandemic and based on to Supreme Decree No. 044-2020 - PCM that declared a State of National Emergency due to the serious circumstances that affect the lives of citizens as a result of the COVID-19 outbreak published on March 15, 2020 and Legislative Decree No. 1465 with the measures to guarantee the continuity of the educational service within the framework of the government's preventive actions against the risk of the spread of covid-19 published on April 19, 2020. In view of this, the institute began its educational activities remotely.

To start the virtual educational service, teachers and students needed to have at least one computer equipment with a stable internet connection in their centers of permanence of social isolation decreed by the government.

Due to the nature of the Computing and Informatics study program, the use of computer equipment was necessary for the teaching-learning process planning to be carried out in the didactic units around a content element that becomes the integrating axis of the process, adding consistency and meaning (Cáceres et al., 2016); and the achievement of terminal capacities was achieved, statements that describe an ordered sequence of knowledge, cognitive abilities, skills and attitudes related to a specific function, which must be achieved at the end of the module for efficient performance in the functions of a position (Canales and Sabelino, 2008), which are necessary for their professional technical training.

The IESTP Laredo implemented a Learning Management System based on the Moodle platform in order to provide a virtual educational service.

The set of tools of an LMS allows to perform five main functions: (i) the administration of the EA; (ii) the communication of the participants; (iii) content management; (iv) the management of group work, and (v) the evaluation according to Fernández and Cesteros (2009).

The facts revealed in the investigation had an influence on the desertion of students from the Computer Science and Informatics study program for the continuity of their technical professional training studies.

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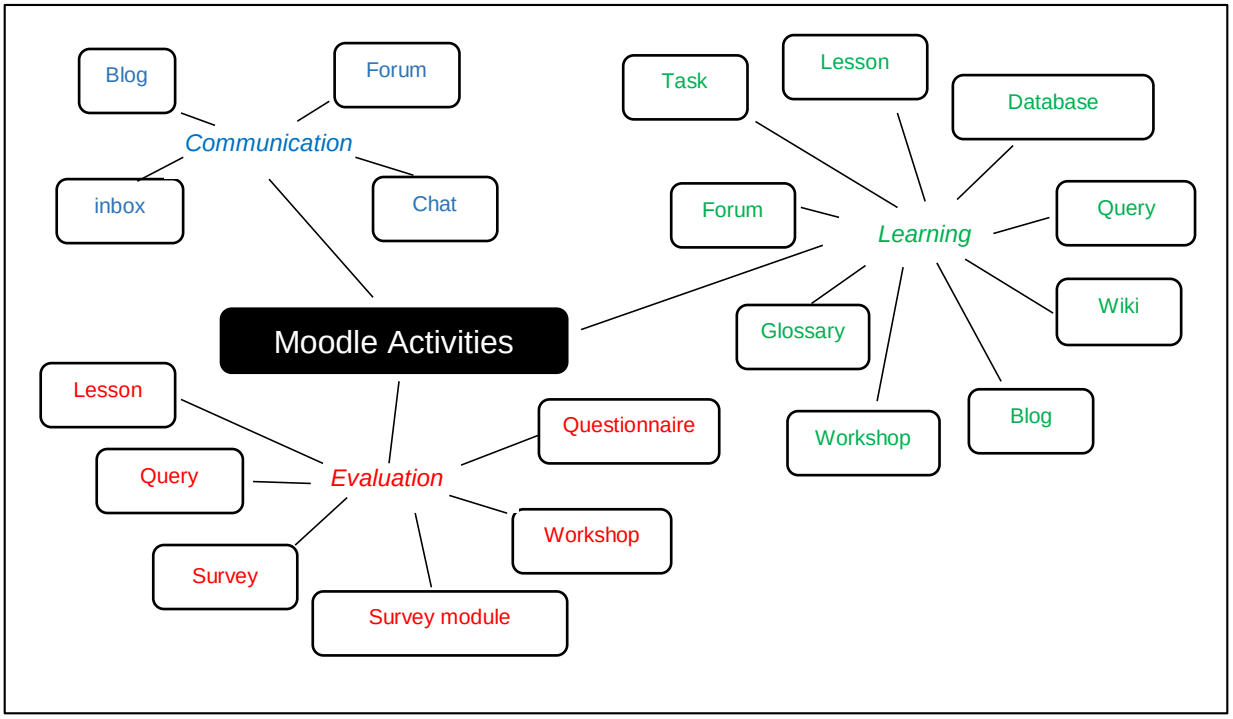

Figure 1: Activities in Moodle
Source: Pineda et al. (2016)

2. Materials and Methods

The population of the IESTP Laredo was the continuity of the students enrolled at the 3 study programs in the 2020 - I school period in a total of 255. The sample was students enrolled in the Computing and Informatics study program in the 2020 - I academic period, which in total was established at 65. The technique used was non-probabilistic convenience sampling. The research used the analytical method (Hurtado and Toro, 2005). The hypothesis contrast design was a pre-experimental design with pre-test and post-test (Hernández et al., 1997). The scheme is as follows:

$$G: O1 \longrightarrow X1 \longrightarrow O2$$

Where:
G: Students enrolled in the Computer Science and Informatics study program in the 2020-I academic period.
O1: The degree of student participation at the beginning of the 2020 academic period - I.
O2: The degree of student participation at the end of the 2020 academic period - I.
X1: virtual teaching.

For the implementation of the Moodle platform, it was based on the research work carried out by Pari and Tapara (2017). The research focused on the dimensions:

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Table 1. Variable and Dimensions

Variable	Dimensions
Virtual teaching	Technology
	Pedagogy
	Context

Source: Cardona (2010)

3. Results

The results obtained from the statistical treatment of the data at the beginning and end of the virtual classes of the academic period 2020 - I. For this, questionnaires were used as research instruments according to García (2003).
The questions asked are:

Number of question	Description of question	Dimension
1	Do you have a computer and stable internet connectivity at home?	Technology
2	Do you have financial resources to continue your studies?	Context
3	Do you consider that the virtual learning interaction is better or equivalent to the face-to-face learning interaction?	Pedagogy
4	Do you access the virtual classroom platform to review the content of the learning sessions?	Technology
5	Do you consider the videoconference schedule established in the schedule appropriate?	Technology
6	Do you consider that learning in the virtual modality would achieve the terminal capacities of the didactic units?	Pedagogy
7	Are you satisfied with studying under the virtual learning modality?	Pedagogy

Based on the questions asked, the results are obtained in the following Dimensions:

Related to question 1: You have a computer and Internet connectivity at your home.

Table 2. Results of question 1

	Yes	No	Sample 1 (P1)	Sample 2 (P2)
Beginning of academic period	41	24	41/65 = 0.63	32/65 = 0.49
End of academic period	32	33		

Where:
P1: population proportion (beginning) = 0.63
P2: population proportion (end) = 0.49

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Ho (Null Hypothesis): the proportion of students does not have a computer and stable internet connectivity at home.
Ha (Alternative Hypothesis): the proportion of students has a computer and stable internet connectivity at home.
P1 = 0.63 and P2 = 0.49 were obtained, deducing that P1> P2. Therefore Ho was accepted.

At the end of the 2020-I academic period, there was a reduction in students with computers and internet connectivity, which was a limitation for access to the virtual classroom and all the stored resources.

Related to question 2: Has financial resources to continue their studies

Table 3. Results of question 2

	Yes	No	Sample 1 (P1)	Sample 2 (P2)
Beginning of academic period	65	0	65/65 = 1	40/65 = 0.61
End of academic period	40	25		

Where:
P1: population proportion (beginning) = 1.00
P2: population proportion (end) = 0.61

Ho (Null Hypothesis): the proportion of students does not have financial resources to continue their studies.
Ha (Alternative Hypothesis): the proportion of students has financial resources to continue their studies.
P1 = 1 and P2 = 0.61 were obtained, deducing that P1> P2. Therefore Ho was accepted.

At the end of the 2020-I academic period, there was a reduction in students with economic resources that allow them to continue with their studies, because the use of a computer with internet connectivity is fundamental resources in the virtual teaching modality.

Related to question 3: Considers that the virtual learning interaction is better or equivalent to the face-to-face learning interaction.

Table 4. Results of question 3

	Yes	No	Sample 1 (P1)	Sample 2 (P2)
Beginning of academic period	42	23	42/65 = 0.65	21/65 = 0.32
End of academic period	21	44		

Where: P1: population proportion (start) = 0.65, P2: population proportion (end) = 0.32

Ho (Null Hypothesis): the proportion of students does not consider that the virtual learning interaction is better or equivalent to the face-to-face learning interaction.
Ha (Alternative Hypothesis): the proportion of students consider that the virtual learning interaction is better or equivalent to the face-to-face learning interaction.
P1 = 0.65 and P2 = 0.32 were obtained, deducing that P1> P2 Therefore, Ho was accepted.

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Another implication at the end of the 2020-I academic period is the reduction of students who considered that virtual learning is better or equivalent to face-to-face learning interaction.

Related to question 4: Access to the virtual classroom platform to review the content of the learning sessions.

Table 5. Results of question 4

	Yes	No	Sample 1 (P1)	Sample 2 (P2)
Beginning of academic period	51	14	51/65 = 0.78	43/65 = 0.66
End of academic period	43	22		

Where: P1: population proportion (start) = 0.78, P2: population proportion (end) = 0.66

Ho (Null Hypothesis): the proportion of students accessing the virtual classroom platform to review the content of the learning sessions.
Ha (Alternative Hypothesis): the proportion of students does not access the virtual classroom platform to review the content of the learning sessions.
P1 = 0.78 and P2 = 0.66 were obtained deducting P1> P2, therefore Ha was accepted.

The reduction of students was evidenced at the end of the academic period 2020 - I, who access the virtual classroom platform and review the content to comply with the evaluations, assignments and participations.

Related to question 5: Considers the established video conference schedule appropriate

Table 6. Results of question 5

	Yes	No	Sample 1 (P1)	Sample 2 (P2)
Beginning of academic period	65	0	65/65 = 1	42/65 = 0.65
End of academic period	42	23		

Where:
P1: population proportion (start) = 1, P2: population proportion (end) = 0.65

Ho (Null Hypothesis): the proportion of students considers the established videoconference schedule to be appropriate.
Ha (Alternative Hypothesis): the proportion of students does not consider the established videoconference schedule appropriate.
P1 = 1 and P2 = 0.65 were obtained, deducing that P1> P2, therefore, Ha was accepted.

At the end of the 2020-I academic period, there was a reduction in the number of students who considered the videoconference schedule appropriate, which had an impact on less synchronous participation of students with teachers.

Related to question 6: It considers that with learning in the virtual modality, the terminal capacities of the didactic units would be achieved.

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Table 7. Results of question 6

	Yes	No	Sample 1 (P1)	Sample 2 (P2)
Beginning of academic period	52	13	53/65 = 0.82	38/65 = 0.58
End of academic period	38	27		

Where: P1: population proportion (start) = 0.82, P2: population proportion (end) = 0.58

Ho (Null Hypothesis): the proportion of students considers that learning in the virtual modality would achieve the terminal capacities of the didactic units.
Ha (Alternative Hypothesis): the proportion of students does not consider that learning in the virtual modality would achieve the terminal capacities of the didactic units.
P1 = 0.82 and P2 = 0.58 were obtained, deducing that P1> P2, therefore Ha is accepted.

At the end of the 2020-I academic period, there was a reduction in students who observed learning in the virtual modality that would achieve the terminal capacities of the didactic units, which are indicators of good learning in higher technological education.

Related to question 7: Compliance with studying under the virtual learning modality.

Table 8. Results of question 7

	Yes	No	Sample 1 (P1)	Sample 2 (P2)
Beginning of academic period	51	14	51/65 = 0.78	26/65 = 0.40
End of academic period	26	39		

Where: P1: population proportion (start) = 0.78, P2: population proportion (end) = 0.40

Ho (Null Hypothesis): the proportion of students is satisfied with studying under the virtual learning modality.
Ha (Alternative Hypothesis): the proportion of students is not satisfied with studying under the virtual learning modality.
P1 = 0.78 and P2 = 0.40 were obtained, deducing that P1> P2, therefore, Ha is accepted.

At the end of the 2020-I academic period, there was a reduction of students who were satisfied with studying under the virtual learning modality, and therefore there was a proportion of students who decided not to continue with their studies.

4. Conclusions

- At the end of the 2020-I academic period, 49% of students had a stable computer and internet at their homes, decreasing by 14% compared to the beginning of the 2020-I academic period, which influences access to classes and content virtual.
- At the end of the 2020 - I academic period, 61% of students had financial resources to continue their studies, observing a 39% reduction compared to the beginning of the 2020 - I academic period, which students withdrew or reserved enrollment for the next school year.
- At the end of the academic period 2020 - I, 32% of students did not consider that the virtual learning interaction is better or equivalent to the face-to-face learning interaction; compared

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to 65% at the beginning of the 2020 academic period - I existing a disagreement with the virtual learning modality.

- At the end of the 2020 - I academic period, 66% of students access the virtual classroom platform, observing a 12% reduction compared to the beginning of the 2020 - I academic period, therefore, the remaining students did not have access to the academic material, upload the respective tasks or take the evaluations online. Given this, they were considered disabled in the teaching units.
- At the end of the academic period 2020 - I, 65% of students considered the established videoconferencing schedule to be appropriate compared to the beginning of the academic period 2020 - I, due to a proportion of students with the need to work and stopped studying due to lack of technological mechanisms for the sake of continuity in their studies.
- At the end of the academic period 2020 - I, 58% of students considered that learning in the virtual modality reached the terminal capacities of the didactic units, therefore, a reduction of 24% compared to the beginning of the academic period 2020 - I, and Disagreements for the achievement of terminal abilities were revealed as an indicator of good learning.
- At the end of the academic period 2020 - I, 40% of students indicated compliance in the execution of classes under the virtual learning modality compared to 78% at the beginning of the academic period 2020 - I, therefore, it is a reduction in satisfaction under the virtual modality in student dropout.

Acknowledgments

Our sincere thanks to the IESTP Laredo for facilitating access and providing the information of the students enrolled in the academic period 2020 - I and the students of the Computer Science and Informatics study program for giving us their time in carrying out this research.

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