Original Article

Open Source Platform and E-learning in a Public University in Peru

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Abstract

The objective of this research is to determine how the Open Source platform will affect the e-learning of students of a public university. The Methodology that has been used in this research is a mixture of qualitative and quantitative techniques with a cross-sectional, descriptive and correlational non-experimental research design, using surveys with closed questions using the Likert scale as a collection instrument. The design of the research has allowed to work on two groups (specialist and student), which a measurement instrument was applied to the specialists, based on said information, the open source platform was developed and the Management System of Learning (LMS), to be tested and validated by the sample, applying the instructional design of the MOOC course. The sample used was non-probabilistic, determined by interest, by bringing together specialists (nd = 13) and first-year students (ne = 37) from the Faculty of Geographical, Environmental and Ecotourism Engineering. The results obtained by the final instruments with respect to the first instrument, indicate that the content manager tested and validated by the selected sample is favorable. Consequently, it is concluded that the Open Source platform affects the participation, qualitative evaluation and development of individual and group activities of students of a public university, where the perception obtained by the results indicates that it is aligned with the objectives of the research.

Keywords: Open Source Platform, participation, qualitative evaluation, activities.

INTRODUCTION

The current situation due to this pandemic, makes us think about the use of technologies applied to the training of students, with the use of virtual platforms, where various activities are assigned such as tasks, forums, practices, etc., the Federico Villarreal National University currently uses the MS Teams platform, as an alternative solution for the teaching of learning of our students in a virtual way, and the participation of students is appreciated in a relative way under a quantitative approach, using synchronous classes (videoconferences) and asynchronous classes (forums, assignments, etc.), applying evaluation instruments without considering the qualitative approach, especially in asynchronous classes, where the active participation of the student is fundamental in individual and / or group activities. Students generally have a head-on clash with the courses of the first years of the university career, due to the educational gap that exists between the level of teaching-learning that is provided in the educational institutions of basic education and the teaching-learning that is taught in the university, which our entrants feel the need to manage knowledge to be able to pass their subjects, some enter web portals such as YouTube or other means that allow them to learn asynchronously, but generate so much information that sometimes it is impossible for them to draw conclusions from specific topics according to the learning contents indicated in their subjects, since they cannot access a specific platform that contains massive and open online courses where they can develop their capacities. These situations generate concern in the performance of these future professionals to have a gap in their cognitive level, so the following research problem is formulated: How will the Open Source platform affect the e-learning of students of a public university? In the same way, secondary problems are derived, how will the Open Source platform establish in e-learning the participation of students from a public university? Determine how the Open Source platform will allow in e-learning the qualitative evaluation of students of a public university? How will the Open Source platform allow to influence in e-learning the individual and group activities of the students of a public university?

In various parts of the world, Open Source platform is being implemented, to be able to teach online courses in an asynchronous way of massive and open type, if we focus on our continent, the beginnings of the MOOC courses (Massive Open Online

Course) in Spanish would be massive and open online courses, it was held at the University of São Paulo, Brazil, in 2013, with two first MOOC courses that were basic physics (taught by Vanderlei Salvador Bagnato), and probability and statistics, (taught by professors Melvin Cymbalista and André LemeFleury). Having a record in ten thousand students enrolled. Another experience was in Guatemala in 2012, where the MOOC course called "Developing applications for iPhone and iPad" was implemented, where there was a maximum enrollment of more than 5380 students. Ruiz (2015). There are also several researches related to the research topic, including: Lena Ivannova Ruiz Rojas (2017) University of Salamanca. With his thesis: "METHODOLOGY, THROUGH MASSIVE VIRTUAL PROCESSES, FOR THE ECUADORIAN PUBLIC FUNCTION" he mentions that his research objective: "They are the methodologies that guide from content planning, instructional design to obtain a virtual course structured in the MOOC platform". Jeimmy del Carmen Carrera López (2018) Monterrey Institute. With his thesis: "MOTIVATION AND LEARNING IN MOOC WITH EDUCATIONAL INNOVATION TO TRAIN IN ENERGY SUSTAINABILITY" he mentions that his research objective is: "To know the motivation and learning perceived by the participants of the MOOC courses trained in Energy Sustainability and that were designed with educational innovation strategies".

On the other hand, according to Universia (2020), indicates that online courses under Open Source platform such as MOOC courses are being taught by different Peruvian universities (private in particular) in order to respond to the learning needs of students and the community in general, as well as the virtual platform Centrum Catholic, of the Pontifical Catholic University of Peru offers a large catalog of MOOC courses that are taught by its own teachers, where they present various basic tools that will serve for the control and measurement of financial ratios. Likewise, the University of Piura has different MOOC courses referring to business needs aimed at industry. Capturing the interest of the industry through virtual communication and continuous learning. Currently, open source platforms are being developed due to the implementation of virtual teaching as Massive and open online courses available to the community, where the participant can access freely at no cost and with an asynchronous self-learning, where the main axis is the student as a trainer of their learning through didactic contents that have a detailed process step by step to achieve the acquired competence. An example of optimal adaptation are the MOOC courses instituted by the Tecnológico de Monterrey by providing the community with the program: "Transform your course to the digital context" where teachers from the different national universities of Peru participated, which was developed successfully, allowing the teacher to achieve their acquired competence and generating a certificate issued and certified by said institution.

Currently the Federico Villarreal National University conducts virtual classes synchronously and asynchronously, based on proprietary platforms such as MS TEAMS (synchronous and Asynchronous), which have a cost per license or maintenance, but there are no MOOC Courses (Massive Online Open Courses) better known as massive and open online courses that allow the university community to learn asynchronously, learning based on virtual teaching that will allow them to perform better in their evaluations, according to their needs.

It is therefore necessary that in the e-learning process the active participation of students in the platform must be highlighted within the established dimensions, which allow them to pass without problem the general and specific courses, others are cloistered in the libraries harming their health in some cases when it was in person or spend hours and hours in virtual libraries, based on this, the instructional design that is being applied to this platform is to generate individual and group activities that allow their cognitive development of capacities in the contents learned individually and in groups, relating to each other.

General courses such as mathematics, research methodology, environment and social responsibility, information technologies, among others, are subjects within the 2019 curricular plan in all the faculties of the university, without taking into account the specialty courses, of which about 60% disapprove in the partial or final exams, having to go even to substitute exam or deferred exam in some cases, because the level of learning that he previously obtained before his entry was not relevant in his cognitive process having a quantitative evaluation (0-20), leaving aside the process of generating capacities and achievements of the student to consolidate what kind of competence he obtained and record an adequate qualitative evaluation as commitment and responsibility, positive and proactive attitude of the student. From the above, the main objective of this research is to determine the way in which the Open Source platform will affect the e-learning of students of a public university. In that order, the basics are: Determine how the Open Source platform will affect e-learning, the participation of students of a public university. Determine how the Open Source platform will allow in e-learning, the qualitative evaluation of the students of a public university and determine the way in which the Open Source platform will influence the e-learning, the individual and group activities of the students of a public university.

METHOD

The research is basic, non-experimental design, descriptive cross-sectional. The research was carried out in 2021. The population of this research is made up of first-year students of the three professional careers of the Faculty of Geographical, Environmental and Ecotourism Engineering, which are: Geographic Engineering, Environmental Engineering and Ecotourism

Engineering (Table 1).

Table 1. Population of first-year students of the Faculty of Geographical, Environmental and Ecotourism Engineering

N°	Professional School	Number of students first year 2020
1	Environmental Engineering	44
2	Ecotourism Engineering	7
3	Geographic Engineering	22
Total		73

A sample of size 37 was randomly selected with a confidence level of 95% and a maximum permissible error of 5% for finite populations. Students of the first level and specialized teachers who impart knowledge at these levels were considered, they can be general and / or specific studies corresponding to the three professional careers of the Faculty of study. The type of sample is Discretionary (Non-probabilistic sampling) that allowed to obtain information about the preeminent activities that generate greater value to them such as: online surveys, online interviews, the review and evaluation of the information collected, the classification of documents related to the subject and the choice of software under open source.

For the descriptive and inferential analysis, we proceeded with the statistical software SPSS version 23. The questionnaires were validated by the expert. Reliability was determined through the calculation of Cronbach's Alpha coefficient, using Cronbach's alpha. The reliability of the instrument aimed at the thirteen (13) national and international specialists on e-learning platforms has been considered as internal consistency, determining a Cronbach's alpha (α =0.839) which is considered good according to Hernández (2005). Instruments were used such as: a virtual questionnaire to specialists in the use of virtual platforms in massive and open online courses national and foreign, where the dimensions of e-learning that will allow building the appropriate platform based on the instructional design model are validated, this questionnaire was carried out through the online form application of the office 365. A virtual questionnaire to the students to collect information about their previous knowledge, which allowed them to design the contents of the MOOC courses. Statistical tables or tables, for data analysis the Likert scale was applied generating statistical tables of each question formed by the dimension applied directly to the dependent variable applying Cronbach's alpha for its validity. The virtual platform applied is based on Moodle Cloud – LMS, which has allowed the design of MOOC courses, through content that has been presented to first-year students.

RESULTS

Quantitative Data

Below, the results of sizing e-learning under the asynchronous modality are shown, in which a questionnaire was carried out to thirteen (13) specialist evaluators of national and international scope in online courses type MOOC, said evaluation is related to the following dimensions:

Active Participation (8 items: From 1 to 8)

Qualitative Assessment (5 items: From 9 to 13)

Individual Activities (5 items: From 14 to 18)

Group Activities (6 items: From 19 to 24)

Table 2. Quantitative results per item according to each dimension.

N°	*Dimesion*	*Detail*	*Cumulative Score*
1		*It is important that the student handles properly an online course on a virtual platform of open source.*	*51*
2		*The communication and interaction of the students on the virtual platform*	*62*

3	Active Participation	The student of the online course, must register a brief description of your personal and academic profile, adding links from your social networks or personal websites	62
4		It is important to respect the rules of behavior in virtual environment by the student	51
5		It is vital the participation of the student in social and informal conversations that are not part of it of the course contents	51
6		The student must have skills necessary for the proper use of the virtual platform	65
7		It is important that the student comparts additional knowledge to other colleagues through forums.	65
8		The student's contribution to their individual or group appreciations should generate an assertive climate in the group	39
9	Qualitative Assessment	The virtual teacher has a general involvement in the student's formative action.	39
10		The virtual teacher must carry out motivation strategies towards learning in students	55
11		A positive attitude must be constantly generated in students.	55
12		Strategies must be carried out that generate a constant participation of the students.	61
13		Students should be guided in their commitment and responsibility in the fulfillment of their training.	61
14	Individual Activities	Strategies must be applied that allow the mastery of the contents of the course by the student in their individual activities.	60
15		It is important the delivery in time and form of the students in their tasks, forums, practices, etc.	60
16		A clear detail should be made in the specifications indicated in each individual activity such as the task, forum, etc.	60
17		Individual student activities should be aligned and applied to their professional reality	60
18		It is important the contributions of added values of the students in their activities	64
19	Group Activities	The work coefficient must be evaluated performed/individual effort in group activities	64
20		It is important the student's contributions, demonstrate mastery of content at the group level	63
21		The motivation to the group is vital in the realization of the task by the virtual teacher	63

22		*It is important to evaluate the student's contributions in their corresponding groups in each work requested.*	*64*
23		*It is important to carry out group activities, to generate synergy of the students in their groups*	*64*
24		*Strategies must be generated so that the student contributes to the group's commitment in the fulfillment of its activities.*	*62*

Note: Minimum score is 0 and maximum score is 65.

Table 3. Quantitative results per evaluator according to total items.

Evaluator	Dimension1	Dimension2	Dimension3	Dimension4	Final Evaluation
1	34	23	22	27	106
2	35	25	25	30	115
3	34	23	21	29	107
4	36	25	24	27	112
5	36	25	25	30	116
6	30	25	25	30	110
7	33	23	23	27	106
8	37	25	25	30	117
9	38	25	25	30	118
10	35	24	22	30	111
11	37	25	25	30	117
12	35	24	24	28	111
13	24	21	21	28	94

Note: Minimum of the final evaluation is 0 and the maximum is 120

Dimension 1: Minimum Evaluation is 0 and Maximum Evaluation is 40

Dimension 2: Minimum Assessment is 0 and Maximum Assessment is 25

Dimension 3: Minimum Evaluation is 0 and Maximum Evaluation is 25

Dimension 4: Minimum Assessment is 0 and Maximum Assessment is 30

In tables 4 and 5, the specialists surveyed state that the student properly manages an online course on an open source virtual platform; 5 specialists indicated that they are totally in agreement, which represents 38.46%, 4 specialists partially agree, which represents 30.77%, 3 specialists report that they neither agree nor disagree, which represents 23.08% and 1 specialist indicates to be totally in disagreement, which represents 7.69%. That is, 69.23% agree on whether they consider that the student properly manages an online course a virtual platform in open source.

Table 4. Results of the active participation dimension.

Category / Dimension	1	2	3	4	5	6	7	8
Totally agree	38.46%	92.31%	38.46%	100.00%	15.38%	30.77%	76.92%	69.23%
Partially agreement	30.77%	0.00%	46.15%	0.00%	30.77%	61.54%	15.38%	23.08%

Neither agree nor disagree	23.08%	0.00%	0.00%	0.00%	15.38%	7.69%	7.69%	7.69%
Partially disagree	0.00%	7.69%	0.00%	0.00%	15.38%	0.00%	0.00%	0.00%
Strongly disagree	7.69%	0.00%	15.38%	0.00%	23.08%	0.00%	0.00%	0.00%

Table 5. Proper management of an online course on an open source virtual platform.

Answer	Quantity	Percentage
Totally agree	5	38.46%
Partially agreement	4	30.77%
Neither agree nor disagree	3	23.08%
Partially disagree	0	0.00%
Strongly disagree	1	7.69%
	13	100.00%

In table 6, the specialists surveyed state that the communication and interaction of students on the virtual platform is relevant; 12 specialists indicated that they are totally in agreement, which represents 92.31% and 1 specialist indicates that they are partially in disagreement, which represents 7.69%. That is, 92.31% agree with respect to whether they consider that the communication and interaction of students in the virtual platform is relevant.

Table 6. Relevancia de la comunicación e interacción de los estudiantes en la plataforma virtual

Answer	Quantity	Percentage
Totally agree	12	92.31%
Partially agreement	0	0.00%
Neither agree nor disagree	0	0.00%
Partially disagree	1	7.69%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 7, the specialists surveyed state that the student registers a brief description of their personal and academic profile, adding links from their personal social networks or website; 5 specialists indicated that they are totally in agreement, which represents 38.46%, 6 specialists partially agree, which represents 46.15% and 2 specialists indicate that they totally disagree, which represents 15.38%. That is, 84.61% agree with whether they consider that the student registers a brief description of their personal and academic profile, adding links from their social networks or personal website.

Table 7. Registration of a brief description of the personal and academic profile, adding links from your personal social networks or website.

Answer	Quantity	Percentage
Totally agree	5	38.46%
Partially agreement	6	46.15%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	2	15.38%
Total	13	100

From table 8, the specialists surveyed state that it is important for the student to respect the norms of behavior in a virtual environment; 13 specialists indicated that they are in total agreement, which represents 100.00%. That is, 100.00% agree on whether they consider that it is important for the student to respect the rules of behavior in a virtual environment.

Table 8. Importance of the student's respect for the rules of behaviour in a virtual environment.

Answer	Quantity	Percentage
Totally agree	13	100.00%
Partially agreement	0	0.00%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 9, the specialists surveyed state that it is vital for the student to participate in social and informal conversations that are not part of the course contents; 2 specialists indicated that they are totally in agreement, which represents 15.38%, 4 specialists partially agree, which represents 30.77%, 2 specialists report that they neither agree nor disagree, which represents 15.38%, 2 specialists indicate to be partially in disagreement, which represents 15.38% and 3 specialists report that they are totally in disagreement, which represents 23.08%. That is, 46.15% agree that student participation in social and informal conversations that are not part of the course contents is vital.

Table 9. Importance of student participation in social and informal conversations that are not part of the course contents.

Answer	Quantity	Percentage
Totally agree	2	15.38%
Partially agreement	4	30.77%
Neither agree nor disagree	2	15.38%
Partially disagree	2	15.38%
Strongly disagree	3	23.08%
Total	13	100.00%

From table 10, the specialists surveyed state that the student must have the necessary skills for the proper use of the virtual platform; 4 specialists indicated that they are totally in agreement, which represents 30.77%, 8 specialists partially agree, which represents 61.54% and 1 specialist refer that they neither agree nor disagree, which represents 7.69. That is, 92.31% agree that the student must have the necessary skills for the proper use of the virtual platform.

Table 10. Importancia de poseer habilidades necesarias para el uso adecuado de la plataforma virtual.

Answer	Quantity	Percentage
Totally agree	4	30.77%
Partially agreement	8	61.54%
Neither agree nor disagree	1	7.69%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 11, the specialists surveyed state that it is important for the student to share additional knowledge with the rest of the classmates; 10 specialists indicated that they are totally in agreement, which represents 76.92% and 2 specialists partially agree, which represents 15.38%. That is, 100.00% agree that it is important for the student to share additional knowledge with the rest of the classmates.

Table 11. Importance of the student sharing additional knowledge with other classmates through forums.

Answer	Quantity	Percentage
Totally agree	10	76.92%
Partially agreement	2	15.38%
Neither agree nor disagree	1	7.69%
Partially disagree	0	0.00%

Strongly disagree	0	0.00%
Total	13	100.00%

From table 12, the specialists surveyed state that the student's contribution with their individual or group assessments must generate an assertive climate in the group; 9 specialists indicated that they are totally in agreement, which represents 69.23%, 3 specialists partially agree, which represents 23.08% and 1 specialist report that they neither agree nor disagree, which represents 7.69. That is, 92.31% agree that the student's contribution to their individual or group appreciations should generate an assertive climate in the group.

Table 12. The student's contribution to their individual or group appreciations should generate an assertive climate in the group.

Answer	Quantity	Percentage
Totally agree	9	69.23%
Partially agreement	3	23.08%
Neither agree nor disagree	1	7.69%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From tables 13 and 14, the specialists surveyed state that the virtual teacher has a general involvement in the student's training action; 8 specialists indicated that they are totally in agreement, which represents 61.54% and 5 specialists partially agree, which represents 38.46%. That is, 100.00% agree that the virtual teacher has a general involvement in the student's formative action.

Table 13. Dimension of the qualitative evaluation the following result was obtained in percentages for each ITEM contained in the dimension:

Category / Dimension	9	10	11	12	13
Totally agree	61.54%	92.31%	84.62%	92.31%	76.92%
Partially agreement	38.46%	7.69%	15.38%	7.69%	23.08%
Neither agree nor disagree	0.00%	0.00%	0.00%	0.00%	0.00%
Partially disagree	0.00%	0.00%	0.00%	0.00%	0.00%
Strongly disagree	0.00%	0.00%	0.00%	0.00%	0.00%

Table 14. The virtual teacher has a general involvement in the student's formative action.

Answer	Quantity	Percentage
Totally agree	8	61.54%
Partially agreement	5	38.46%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 15, the specialists surveyed state that the virtual teacher must carry out motivation strategies towards learning in students; 12 specialists indicated that they are totally in agreement, which represents 92.04% and 1 specialist indicates that they are partially in agreement, which represents 7.96%. That is, 100.00% agree that the virtual teacher should carry out motivation strategies towards learning in students.

Table 15. The virtual teacher must carry out motivation strategies towards learning in students.

Answer	Quantity	Percentage
Totally agree	12	92.31%
Partially agreement	1	7.69%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 16, the specialists surveyed state that a positive attitude should be constantly generated in the students; 11 specialists indicated that they are totally in agreement, which represents 84.62% and 2 specialist indicates that they are partially in agreement, which represents 15.38%. That is, 100.00% agree that a positive attitude should be constantly generated in students.

Table 16. Generación de una constante actitud positiva en los estudiantes.

Answer	Quantity	Percentage
Totally agree	11	84.62%
Partially agreement	2	15.38%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 17, the specialists surveyed state that strategies should be carried out that generate a constant participation of the students; 12 specialists indicated that they are totally in agreement, which represents 92.31% and 1 specialist indicates that they are partially in agreement, which represents 7.69 %. That is, 100.00% agree that strategies should be carried out that generate a constant participation of students.

Table 17. Realization of strategies that generate a constant participation of the students.

Answer	Quantity	Percentage
Totally agree	12	92.31%
Partially agreement	1	7.69%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 18, the specialists surveyed state that students should be guided in their commitment and responsibility in the fulfillment of their training; 10 specialists indicated that they are totally in agreement, which represents 76.92% and 3 specialists indicate that they are partially in agreement, which represents 23.08%. That is, 100.00%, indicates that students should be guided in their commitment and responsibility in the fulfillment of their training.

Table 18. Orientation of students in their commitment and responsibility in the fulfillment of their training.

Answer	Quantity	Percentage
Totally agree	10	76.92%
Partially agreement	3	23.08%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%

Total	13	100.00%

From tables 19 and 20, the specialists surveyed state that strategies should be applied that allow the mastery of the course contents by the student in their individual activities; 8 specialists indicated that they are totally in agreement, which represents 61.54% and 5 specialists indicate that they are partially in agreement, which represents 38.46%. That is, 100.00%, indicates that strategies must be applied that allow the mastery of the contents of the course by the student in their individual activities.

Table 19. Dimensión de la actividad individual en porcentajes por cada ITEM contenida en la dimensión.

Category / Dimension	14	15	16	17	18
Totally agree	61.54%	84.62%	84.62%	61.54%	76.92%
Partially agreement	38.46%	15.38%	15.38%	38.46%	15.38%
Neither agree nor disagree	0.00%	0.00%	0.00%	0.00%	7.69%
Partially disagree	0.00%	0.00%	0.00%	0.00%	0.00%
Strongly disagree	0.00%	0.00%	0.00%	0.00%	0.00%

Table 20. Application of strategies that allow the mastery of the contents of the course by the student in their individual activities.

Answer	Quantity	Percentage
Totally agree	8	61.54%
Partially agreement	5	38.46%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 21, the specialists surveyed state that it is important to deliver students in a timely manner in their tasks, forums, practices, etc.; 11 specialists indicated that they are totally in agreement, which represents 84.62% and 2 specialists indicate that they are partially in agreement, which represents 15.38%. That is, 100.00%, indicates that it is important to deliver students in a timely manner in their tasks, forums, practices, etc.

Table 21. Importance of the delivery in time and form of the students in their tasks, forums, practices, etc.

Answer	Quantity	Percentage
Totally agree	11	84.62%
Partially agreement	2	15.38%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
	13	100.00%

From table 22, the specialists surveyed state that a clear detail should be made in the specifications indicated in each individual activity such as the task, forum, etc.; 11 specialists indicated that they are totally in agreement, which represents 84.62% and 2 specialists indicate that they are partially in agreement, which represents 15.38%. That is, 100.00%, indicates that it is important to make a clear detail in the specifications indicated in each individual activity such as the task, forum, etc.

Table 22. Realization of a clear detail in the specifications indicated in each individual activity such as the task, forum, etc.

Answer	Quantity	Percentage
Totally agree	11	84.62%
Partially agreement	2	15.38%
Neither agree nor disagree	0	0.00%

Partially disagree	0	0.00%
Strongly disagree	0	0.00%
	13	100.00%

From table 23, the specialists surveyed state that the individual activities of the students must be aligned and applied to their professional reality; 8 specialists indicated that they are totally in agreement, which represents 61.54% and 5 specialists indicate that they are partially in agreement, which represents 38.46%. That is, 100.00%, indicates that the individual activities of students must be aligned and applied to their professional reality.

Table 23. Individual student activities should be aligned and applied to their professional reality

Answer	Quantity	Percentage
Totally agree	8	61.54%
Partially agreement	5	38.46%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 24, the specialists surveyed state that the contributions of added values of the students in their activities are important; 10 specialists indicated that they are totally in agreement, which represents 76.92%, 2 specialists indicate that they are partially in agreement, which represents 15.38% and 1 specialist indicates that neither agree nor disagree. which represents 7.96%. That is, 92.04%, indicates that the contributions of added values of students in their activities are important.

Table 24. Support of students' contributions of added value to their activities.

Answer	Quantity	Percentage
Totally agree	10	76.92%
Partially agreement	2	15.38%
Neither agree nor disagree	1	7.69%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From tables 25 and 26, the specialists surveyed state that the coefficient work done/ individual effort in group activities should be evaluated; 8 specialists indicated that they are totally in agreement, which represents 61.54%, 4 specialists indicate that they are partially in agreement, which represents 30.77% and 1 specialist indicates that they partially disagree, which represents 7.69%. That is, 92.31%, indicates that it is important that the coefficient of work done / individual effort in group activities should be evaluated.

Table 25. Dimension of group activity in percentages for each ITEM contained in the dimension.

Category / Dimension	19	20	21	22	23	24
Totally agree	61.54%	84.62%	84.62%	100.00%	92.31%	84.62%
Partially agreement	30.77%	15.38%	15.38%	0.00%	7.69%	15.38%
Neither agree nor disagree	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Partially disagree	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%
Strongly disagree	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 26. Evaluation of the coefficient of work done/individual effort in group activities.

Answer	Quantity	Percentage
Totally agree	8	61.54%
Partially agreement	4	30.77%
Neither agree nor disagree	0	0.00%
Partially disagree	1	7.69%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 27, the specialists surveyed state that the student's contributions are important, demonstrate mastery of contents at the group level; 11 specialists indicated that they are totally in agreement, which represents 84.62% and 2 specialists indicate that they are partially in agreement, which represents 15.38%. That is, 100.00%, indicates that the student's contributions are important, demonstrate mastery of content at the group level.

Table 27. Importance of student contributions, demonstrate mastery of content at the group level.

Answer	Quantity	Percentage
Totally agree	11	84.62%
Partially agreement	2	15.38%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 28, the specialists surveyed state that it is important to motivate the group is vital in the performance of the task by the virtual teacher; 11 specialists indicated that they are totally in agreement, which represents 84.62% and 2 specialists indicate that they are partially in agreement, which represents 15.38%. That is, 100.00%, indicates that it is important to motivate the group is vital in the performance of the task by the virtual teacher.

Table 28. The motivation to the group is vital in the realization of the task by the virtual teacher.

Answer	Quantity	Percentage
Totally agree	11	84.62%
Partially agreement	2	15.38%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From Table 29, the specialists surveyed state that it is important to evaluate the student's contributions in their corresponding groups in each requested work; all the specialists indicated that they do not fully agree. That is, 100.00%, indicates that it is important to evaluate the contributions of the student in their corresponding groups in each requested work.

Table 29. Importance of evaluating the student's contributions in their corresponding groups in each requested work.

Answer	Quantity	Percentage
Totally agree	13	100.00%
Partially agreement	0	0.00%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%

Total	13	100.00%

From table 30, the specialists surveyed state that it is important to carry out group activities, to generate synergy of the students in their groups; 13 specialists indicated that they are totally in agreement, which represents 100.00%. That is, 100.00% agree that it is important to carry out group activities, to generate synergy of students in their groups.

Table 30. Importance of group activities, to generate synergy of students in their groups.

Answer	Quantity	Percentage
Totally agree	12	92.31%
Partially agreement	1	7.69%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

From table 31, the specialists surveyed state that strategies should be generated so that the student contributes to the commitment of the group in the fulfillment of their activities; 11 specialists indicated that they are totally in agreement, which represents 84.62% and 2 specialists indicate that they are partially in agreement, which represents 15.38%. That is, 100.00%, indicates that it is important to generate strategies for the student to contribute to the commitment of the group in the fulfillment of their activities.

Table 31. Generation of strategies for the student to contribute to the commitment of the group in the fulfillment of their activities.

Answer	Quantity	Percentage
Totally agree	11	84.62%
Partially agreement	2	15.38%
Neither agree nor disagree	0	0.00%
Partially disagree	0	0.00%
Strongly disagree	0	0.00%
Total	13	100.00%

In table 32, based on the established dimensions of the dependent variable, it allowed to align the elaboration of the Virtual Platform in Open SOURCE (independent variable) which has been implemented in the online application MOODLE CLOUD – LMS, which is friendly, allowing to elaborate the three MOOC courses for the use of the first year students of the Faculty of Geographical Engineering, Environmental and Ecotourism.

Table 32. Alignment of the dimensions of the dependent variable based on results obtained from the online questionnaire carried out to the specialists.

Dimension	Interval	Result	Condition	Alignment Approval
1	0 to 30	0	Total Misalignment	0 %
2	31 to 60	0	Partial Misalignment	0 %
3	61 to 96	1	Partial Alignment	7.7 %
4	91 to 120	12	Total Alignment	92.3 %

DISCUSSION

According to Ganduxé (2018), it indicated that: "e-learning is a teaching under the virtual modality, with an online or distance training, where the spaces of the space-time barrier, where it is based on flexibility in the generation of student learning, where knowledge management is pertinent, where a personalized interaction between the student and teacher is related, saving on costs, maintaining a synchronous two-way communication, in other asynchronous ones, being a constant update of contents in real time and the most important thing is autonomous learning in students, in the face of this affirmation I agree that e-learning

depends on the flexibility of the student's times where their learning is autonomous and dependent on their will.

According to Carrera (2018) he mentions in his thesis: "MOTIVATION AND LEARNING IN MOOC WITH EDUCATIONAL INNOVATION TO TRAIN IN ENERGY SUSTAINABILITY" he mentions that his research objective is: "To know the motivation and learning perceived by the participants of the MOOC courses trained in Energy Sustainability and that, were designed with educational innovation strategies", I agree that in the MOOC courses the motivation and autonomous learning perceived by the students, accompanied by an instructional design according to their needs, making their way of apprehending more flexible.

According to Masie (2005) indicates that e-learning: "It involves the use of a large network of networks called the internet, but also includes mobile technology solutions, since all use of technology tends to expand, reinforce, distribute, develop, evaluate, certify or accelerate learning processes, covering knowledge management , collaboration and performance support, accompanied by an adequate methodology, according to the above, the appropriate methodology is established according to the need of the student, instituting in the LMS platforms the appropriate instructional design that allows to guide the student in achieving his achievements of competence.

CONCLUSIONS

Based on the results of the Open Source platform through its data analytics, it has improved the participation of students in the activities presented, such as access to different resources such as: videos, questionnaires, individual and / or group forums and tasks, which are characteristics of MOOC courses, where the student's will is vital to develop it. The instructional design of a MOOC course is important, because based on the learning guides they are related according to the needs of the students, where rubrics are applied, to make an evaluative judgment allowing a qualitative evaluation, where it is reflected if the competence acquired by the student is achieved. In the design stage of the ADDIE model, it has allowed individual and group activities to be carried out, through tasks, forums and other necessary resources, where it has allowed a better fulfillment in these activities. Finally, it concludes that the open Source platform significantly affects the virtual learning of participating students enrolled in a MOOC course, which has been reflected in the evidence collected from the last phase of the instructional design implemented.

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