Impact of Distance Education on Scientific Learning at M'sila University-Algeria-

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Abstract:

Distance education (e-learning) has emerged since the beginnings of the 19th century, over time, it has demonstrated its added value in mass training. Managing the learning process constituted a major challenge for the teaching team as well as for all higher education establishments. In 2020 Algeria adopted this type of teaching to meet current requirements by using digital tools (video, email, chat, etc.) in order to facilitate learning and interaction between the student and the teacher , but the lack of prior preparation and creation of appropriate conditions for this type of teaching had its negative impact on the entire process in this case the practice of distance education; teachers were looking for immediate solutions to transfer the educational content planned in person but the opportunity was partly missed. At this level, the purposes of distancing were not better defined this state of affairs has become difficult in particular for students, the obvious question; do these establishments have distance learning tools, and what is the impact of this unexpected reality on the learning process in general?, for this purpose, it is useful to verify the following hypothesis; in the (e-learning) that the problem of acquiring scientific modules remains obvious; this would be due to the insufficiency of information and communication technologies for teaching (ICT).

Keywords: e-learning, ICT, higher education, learning, distance education

Literature Review:

According to (François Orivel and Estelle Orivel, 2006) in their work entitled: Economic analysis of e-learning: some ideas for the future (Keynote Reading) distance education have a long history. This began at the University of London in the 19th century with correspondence courses intended for British citizens residing on the borders of the empire. This type of teaching has been around for a long time, particularly in Australia where private farms are not far from urban areas, recently and according to (BARON, Georges-Louis, 1997) since the sixties, national policies have aimed, with different objectives, to introduce, develop and then integrate information and communication technologies into educational actions: audiovisual (IT) and telematics and telematics. The Covid19 pandemic has accelerated the process of implementing distance learning in several countries around the world. , at this stage, it is useful to focus on this concept in order to describe it according to the organizations and researchers who support it. Distance education or (e-learning) is a way of training students of different categories without the need to go to an educational establishment to attend classes using didactic and technological means, as it can be also defined as a teaching modality that "allows a person to learn relatively independently and to meet this objective.

According to (EL-Mehdi SOLTANI, 2020), cites that (UNESCO, 1987), United Nations Educational, Scientific and Cultural Organization. to clearly clarify distance education as a "mode of teaching, provided by an institution, which does not involve the physical presence of the teacher responsible for giving it in the place where it is received, or in which the

teacher does not 'is present only at certain times or for specific tasks', as it showed that distance education had proven economic legitimacy, linked to the possibility of economies of scale. For its part, the French Standardization Association (AFNOR, 2021) has defined distance educate ion as “a mode of distance training designed to allow individuals to train without traveling to the location of the training”. Training and without the physical presence of a trainer. Distance learning is included in a more general concept of open and distance learning.

Historical and critical reading of this type through some educational institutions in the world has shown that the experience did not withstand the constant hostility of teachers who encountered the technical constraints of the program, as well as the perception and the feeling observed teaching on the part of learners compared to situations in normal times, no more than seeking to understand the theorization of distance training. At this stage (Sandoss Ben Abid-Zarrouk, 2013) has shown that “Distance teaching remains less effective in terms of success than face-to-face teaching”. Regarding students' perception of their learning context (face-to-face students versus virtual students), to confirm this definition (Fatima Aladwan,2018) say that the characteristic of distance education is the use Information and Communication Technologies (ICT) to form communities or study networks where individuals can interact, fostering the educational use of social networks, discussion forums and platforms virtual, to discuss on various issues and at the same time acquire knowledge and modern work tools In order to remedy the problems linked to this type of teaching, several approaches have been adopted, namely: the communicative approach, the action-based approach and the skills-based approach, the latter which has been adopted by Algeria for 15 years. , and reinforced by the idea of (Roegiers, x, 2006), who recognized that the experience of pedagogy according to this approach associated with (ICT) had the merit of putting the student at the heart of learning and prepares the learner to be an active and autonomous subject.

(François Orivel and Estelle Orivel, 2006) in their aforementioned work also argue for this approach by pointing out that e-learning is not intended to supplant, but rather to support, face-to-face teaching. As such, previous studies and experiences carried out in this area have shown that face-to-face teaching is a determining factor in the learning of scientific subject matter, in particular tutorials and practical work which require other technological and didactic means. Only a few theoretical subjects which can be studied remotely.

Following the aforementioned studies, it is useful to conclude their concordance on the following points:

- E-learning, a teaching method will only be extremely effective if it is coupled with mastery of (ICT), but this type of learning can also present disadvantages, namely:
- Distance learning requires spending a lot of time on a computer, plus many problems result, such as visual fatigue, poor posture, lack of social interactions and motivation due to distance learning.
- Mastery of technology and computer hardware for e-learning is essential for the practice of distance teaching

Research objectives.

- Clarify the concept – distance learning –.
- Highlight the essential elements that can strengthen distance education.
- Implement an approach based on a clear and forward-looking vision that aims for the quality of education desired by society.

Conceptual analysis of the hypothesis

Our hypothesis is formulated with a view to empirical verification to know the validity of the prediction in reality. The terms that compose it is unequivocal, precise, meaningful in relation to a certain observable reality and neutral. In the (e-learning) that the problem of acquiring scientific modules remains obvious; this would be due to the insufficiency of information and communication technologies for teaching (ICT).These Hypothesis predicts a relationship between two terms; it requires to be verified in reality and, in this sense, represents the support of the scientific approach. Two concepts dependent on each other (scientific acquisition and information and communication technologies for teaching (ICT). According to (Hirschsprung. Nathalie, 2005) multimedia constitutes a modern challenge for institutions dedicated to teaching, in this context, scientific acquisition is a dependent variable, while the (ICT) is an independent variable is the essential elements to test the hypothesis. Scientific acquisition can be defined as a process which consists of identifying, collecting and formalizing knowledge held by a human expert so that it can be used by a machine; while, (ICT) means bring together a set of tools designed and used to produce, process, store, share, classify, find and read digital documents for teaching and learning purposes.

Materials and Methods

Using the questionnaire as an investigation technique intended for students of the Institute of Management of Urban Techniques in the graduation (license and Master) a sample of 20 undergraduate students and 20 master students, all types of specialties combine (100 people) and also 10 teachers of magisterial rank of this institute in order to answer our open and closed questions and which are prepared beforehand and are based on the extent of the acquisition of scientific information in the current conditions of the (ICT) information and communication technologies for teaching. This study will be carried out through the application of software of (SPSS) (Statistical Package for the Social Sciences) in order to verify the hypothesis of this research.

Results:

The applied study

The study tools

1. The population and sample

The study population includes various relevant categories related to the subject of study, which comprise both professors and university students. From this population, a random sample consisting of 140 individuals was selected.

2. Designing the data collection tool

In order to study e-learning at the university from the perspective of both professors and students, a questionnaire was designed based on previous studies in the formulation process and the selection of relevant items. The tool includes a set of questions with binary and ternary responses as outlined in the following table:"

Table 01: Answer Degrees

Answer degrees	Three degrees			Two degrees	
	1	2	3	1	2
Definition Field	1.00-1.66	1.67-2.33	2.34-3.00	1.00-1.49	1.50-2.00
Calculation Method	Range=largest value - lowest value =3-1=2			Range=largest value - lowest value =2-1=1	

	Length=range/number of degrees =2/3=0.66	Length=range/number of degrees=1/2=1.5

Source: based on Likert scale.

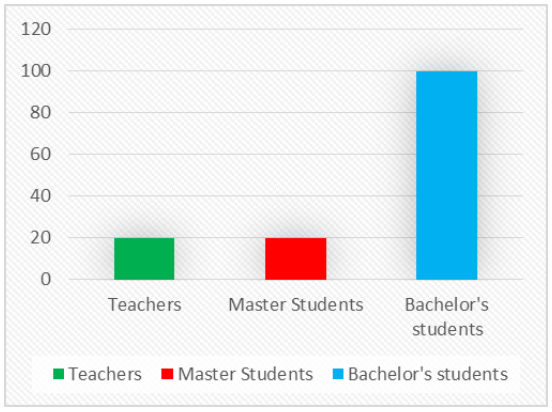
To avoid redundancy, 0.01 was subtracted from each domain and added to the following domain. To ensure the significance of the direction of the score, the Chi-square test and the Student's T-test are used.

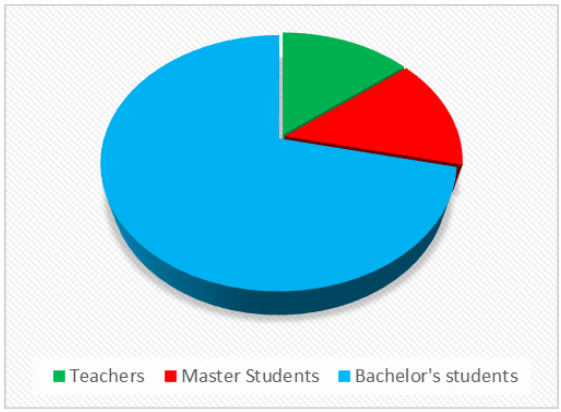
3. Sample description

The following table displays the analysis of sample characteristics at the study site based on the attribute variable, utilizing frequency and relative proportions.

Table 2: The studied sample

Sample	Frequency	Percent
Teachers	20	14,3
Master Students	20	14,3
Bachelor's students	100	71,4
Σ	140	140





Source: Based on the outputs of SPSS.v27.

From the above table, it can be observed that the sample at the study site consists of:

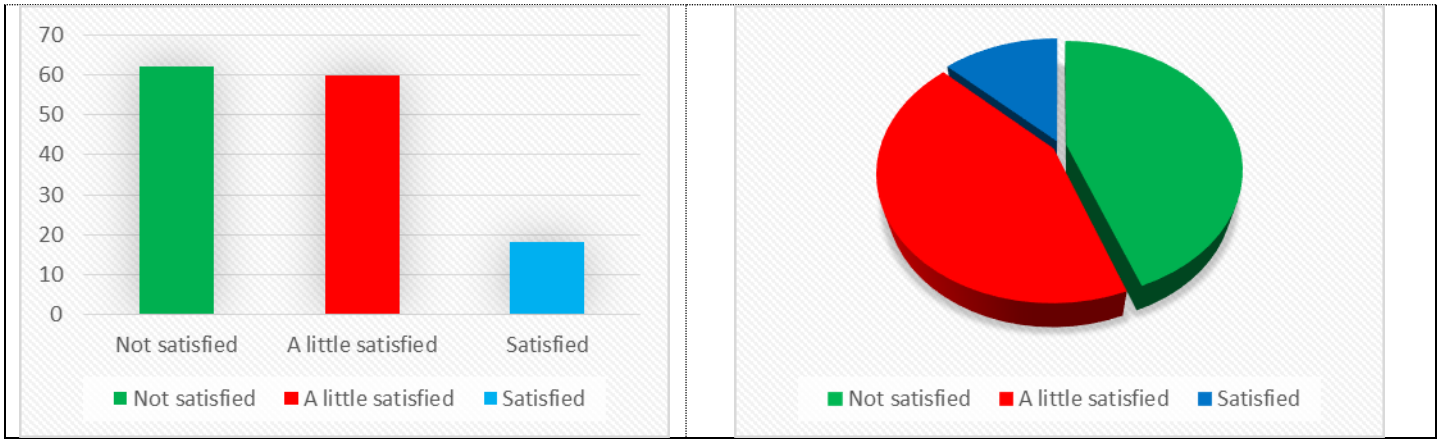
- University teachers, accounting for 14.3% as providers of distance education services.
- University students at various academic levels (master's students at 14.3% and bachelor's students at 71.4%) as recipients of these services".

Analysis of indicators and hypothesis testing

1. Analysis of the 1st indicator: The processed data indicated the results shown in the following table:

Table 3: Analysis of the 1st indicator

Are you satisfied with distance learning?	Answers						Mean	Std.D	Degree	T-test	
	Not satisfied		A little satisfied		Satisfied						
	Fre	%	Fre	%	Fre	%	$\bar{x}$	σ2	←2→	SigTeacher	SigStudent
	62	44.3	60	42.9	18	12.9	1.31	0.68	A little satisfied	0.000	0.000



Source: Based on the outputs of SPSS.v27.

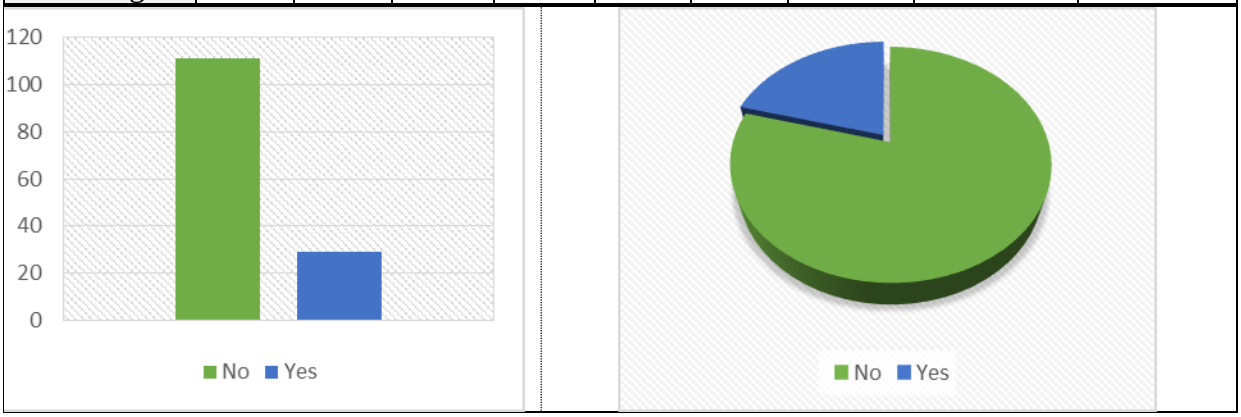
In a study examining e-learning and distance education in universities, both professors and university students were surveyed about their satisfaction with distance learning. The results indicate that 44.3% of respondents are not satisfied, 42.9% are a little satisfied, and 12.9% are satisfied. This distribution suggests a significant portion of dissatisfaction among the sampled population regarding distance learning. The high percentage of respondents expressing dissatisfaction highlights potential challenges or shortcomings in current distance education practices. Further investigation into the specific concerns of dissatisfied participants is crucial for identifying areas of improvement and enhancing the effectiveness and quality of distance learning programs.

With a relatively small standard deviation not exceeding 0.68, this indicates an agreement among the sample items. What further confirms this trend is the statistical significance value of the T-Test, which is below the standard value of 0.05.

2. Analysis of the 2nd indicator: The processed data indicated the results shown in the following table:

Table 4: Analysis of the 2nd indicator

Do you have the necessary ICT tools for distance learning?	Answers				Mean	Std. D	Degree	$\chi 2$	
	No		Yes						
	Fre	%	Fre	%	$\bar{x}$	$\sigma 2$	1.5→ ←	SigTeacher	SigStudent
	111	79.3	29	20.7	1.20	0.40	No	0.000	0.000



Source: Based on the outputs of SPSS.v27.

The survey results reveal that a significant majority, 79.3%, of university professors and students lack the necessary ICT tools for distance learning, with only 20.7% having adequate resources (Mean = 1.20). This stark disparity indicates serious challenges in the accessibility and quality of online education. To address this issue, universities must invest in providing

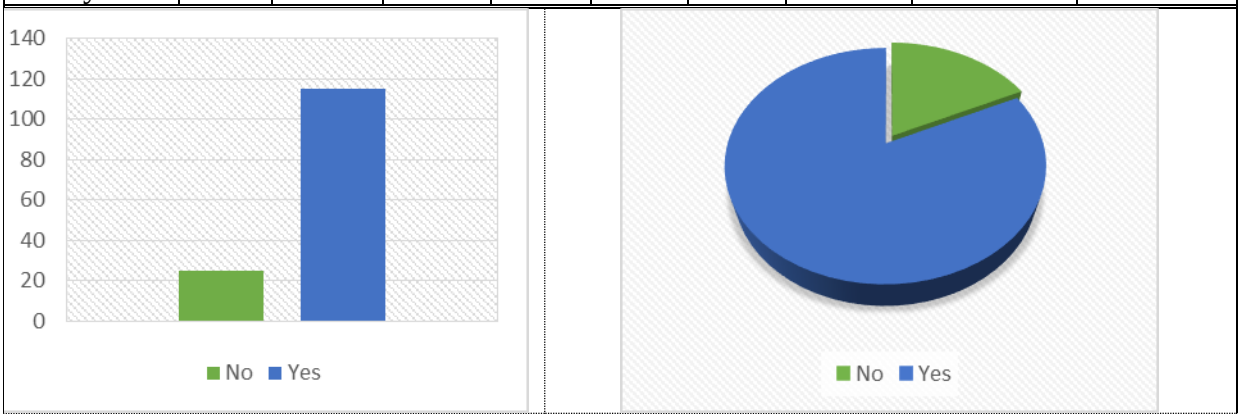
essential ICT tools and training to ensure all participants can effectively engage in distance learning. Improving ICT infrastructure is crucial for enhancing the overall educational experience and outcomes.

A relatively small standard deviation, not exceeding 0.40, suggests consensus among the sample items. This trend is further supported by the Chi-Square's statistical significance value being below the standard threshold of 0.05.

3. Analysis of the 3rd indicator: The processed data indicated the results shown in the following table:

Table 5: Analysis of the 3rd indicator

Do you prefer in-person study?	Answers				Mean	Std. D	Degree	$\chi 2$	
	No		Yes						
	Fre	%	Fre	%	$\bar{x}$	$\sigma 2$	1.5→ ←	SigTeacher	SigStudent
	25	17.9	115	82.1	1.82	0.38	Yes	0.000	0.000
Is the schedule sufficient for you?	51	36.4	89	63.6	1.63	0.48	Yes	0.009	0.002



Source: Based on the outputs of SPSS.v27.

A significant 82.1% of respondents prefer in-person study, highlighting the importance of direct interaction and engagement in the learning process (Mean = 1.82). This preference suggests that face-to-face education is seen as more effective and beneficial by most participants. Universities should consider maintaining or enhancing in-person learning opportunities to meet this demand. The survey shows that 63.6% of respondents find the schedule sufficient, while 36.4% do not (Mean = 1.63). This indicates general satisfaction with the current scheduling but also reveals a need for more flexible options. Addressing the scheduling concerns of the minority could lead to improved overall satisfaction.

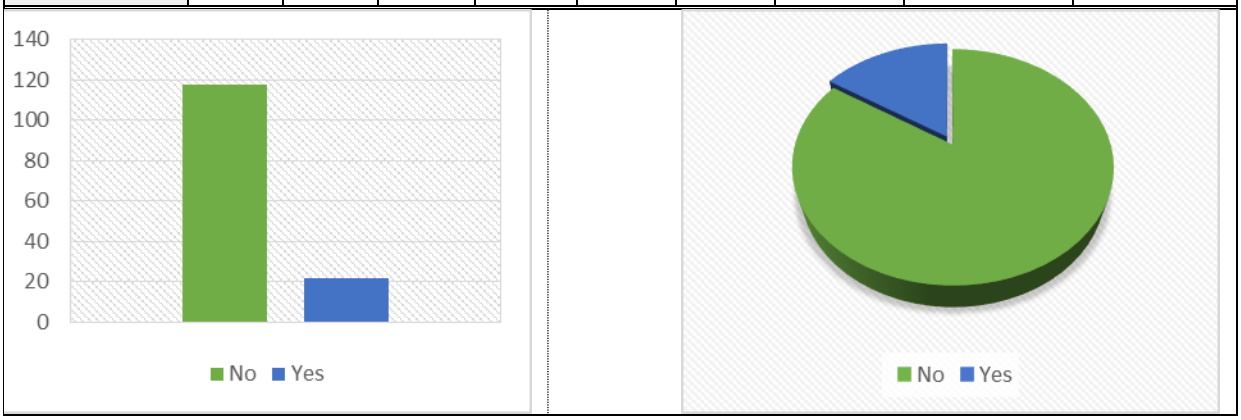
The small standard deviation, which does not exceed 0.48, indicates that the sample items are in agreement. This is reinforced by the Chi-Square's p-value being below the critical value of 0.05.

4. Analysis of the 4th indicator: The processed data indicated the results shown in the following table:

Table 6: Analysis of the 4th indicator

Do you appreciate the intensive	Answers				Mean	Std. D	Degree	$\chi 2$	
	No		Yes						
	Fre	%	Fre	%	$\bar{x}$	$\sigma 2$	1.5→ ←	SigTeacher	SigStudent

program?	118	84.3	22	15.7	1.15	0.36	No	0.000	0.000



Source: Based on the outputs of SPSS.v27.

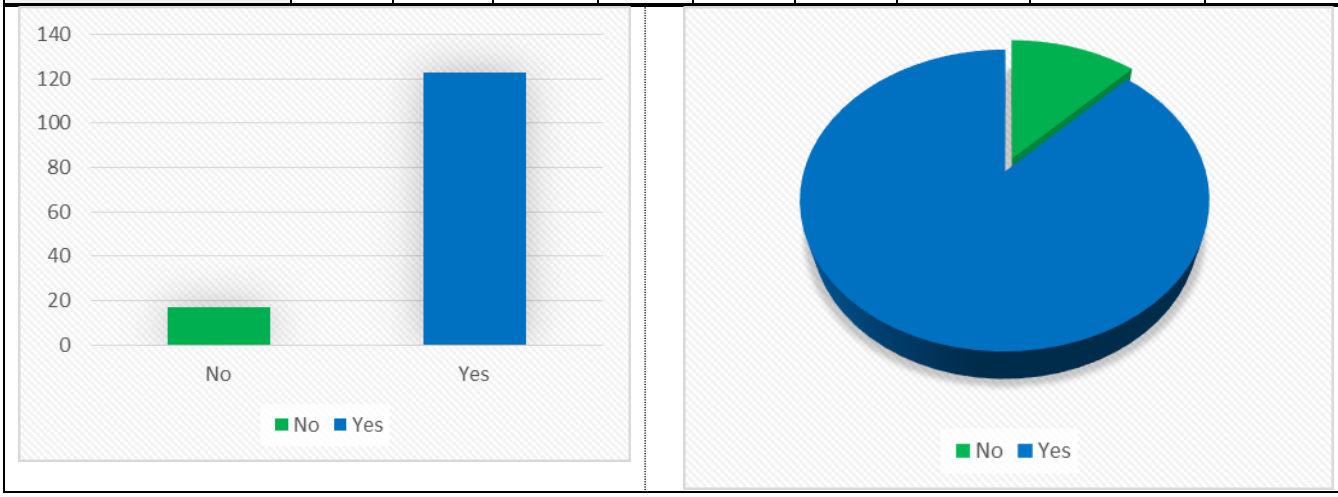
A striking 84.3% of respondents do not appreciate the intensive program, with only 15.7% expressing approval (Mean = 1.15). This overwhelming majority suggests that the intensive program may be too demanding or not well-suited to the needs of most participants. Universities should consider reevaluating the structure and demands of such programs to better align with student and faculty preferences.

With a standard deviation that remains under 0.36, there is evident agreement among the sample items. Additionally, the Chi-Square's significance level being below 0.05 supports this finding.

5. Analysis of the 5th indicator: The processed data indicated the results shown in the following table:

Table 7: Analysis of the 5th indicator

Have you encountered difficulties in understanding (the explanation of) the distance learning courses?	Answers				Mean	Std.D	Degree	χ 2	
	No		Yes						
	Fre	%	Fre	%	$\bar{x}$	σ2	←1.5→	SigTeacher	SigStudent
	17	12.1	123	87.9	1.12	0.32	No	0.000	0.000



Source: Based on the outputs of SPSS.v27.

A significant 87.9% of respondents reported encountering difficulties in understanding the explanation of distance learning courses, with only 12.1% not experiencing such issues (Mean = 1.12). This indicates a major problem with the clarity and comprehensibility of

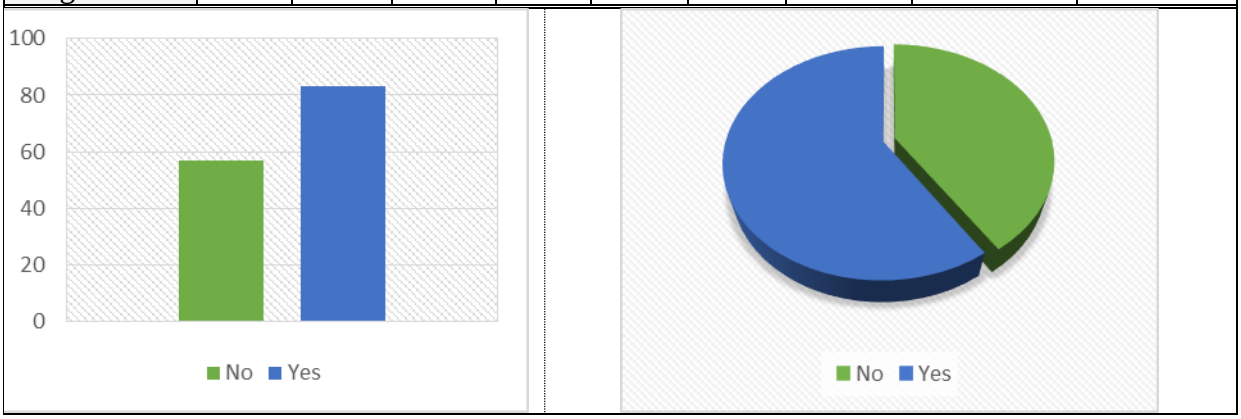
online course explanations. To address this, universities need to improve the quality of instructional materials and provide additional support for students. Enhancing communication and teaching methods could help mitigate these difficulties.

With a standard deviation that remains under 0.32, there is evident agreement among the sample items. Additionally, the Chi-Square's significance level being below 0.05 supports this finding.

6. Analysis of the 7th indicator: The processed data indicated the results shown in the following table:

Table 8: Analysis of the 7th indicator

Do you think the teacher's evaluation was rigorous?	Answers				Mean	Std. D	Degree	χ 2	
	No		Yes						
	Fre	%	Fre	%	x̄	σ2	1.5→ ←	SigTeacher	SigStudent
	57	40.7	83	59.3	1.59	0.49	Yes	0.010	0.028



Source: Based on the outputs of SPSS.v27.

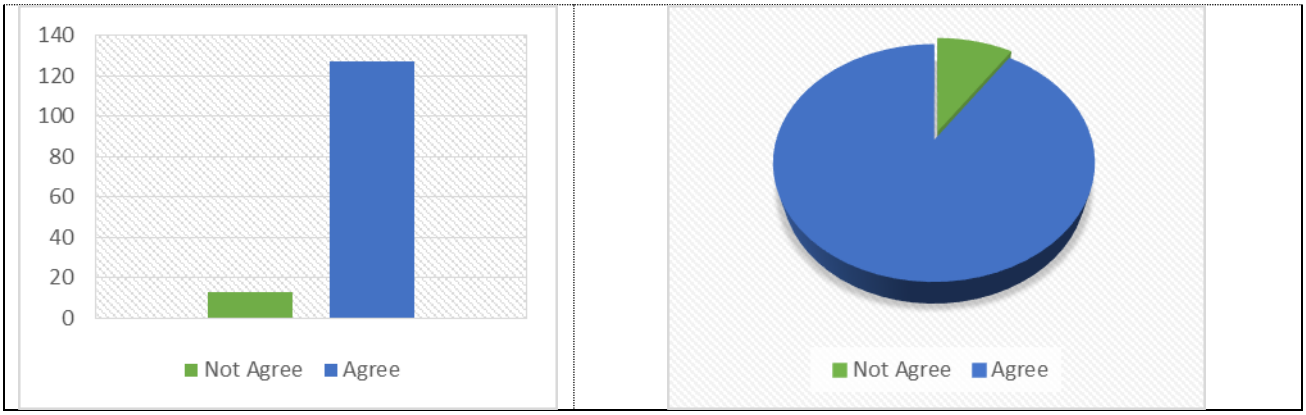
A majority of 59.3% of respondents believe that the teacher's evaluation during the pandemic was rigorous, while 40.7% think otherwise (Mean = 1.59). This suggests that a significant portion of participants perceive the evaluation process to be robust despite the challenges posed by the pandemic. However, there is still room for improvement to ensure fairness and effectiveness in evaluating teaching performance during such unprecedented circumstances.

A standard deviation of less than 0.49 points to a consensus among the sample items. This is corroborated by the Chi-Square's significance level falling below the benchmark value of 0.05.

7. Analysis of the 8th indicator: The processed data indicated the results shown in the following table:

Table 09: Analysis of the 8th indicator

Does the lack of daily feedback between the teacher and the student have a negative impact on oral production?	Answers				Mean	Std.D	Degree	χ 2	
	Not Agree		Agree						
	Fre	%	Fre	%	x̄	σ2	←1.5→	SigTeacher	SigStudent
	13	9.3	127	90.7	1.90	0.29	Agree	0.000	0.000



Source: Based on the outputs of SPSS.v27.

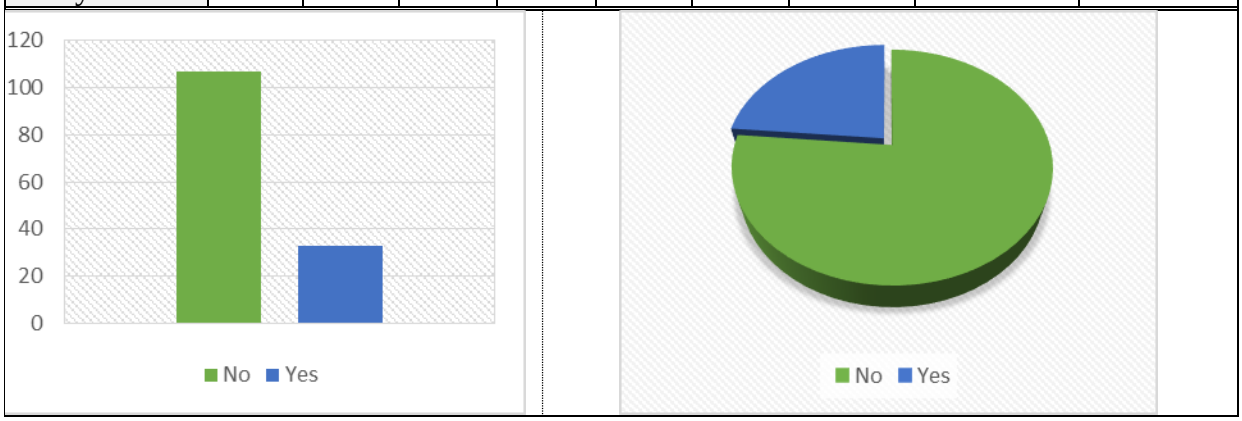
An overwhelming 90.7% of respondents believe that the lack of daily feedback between the teacher and the student has a negative impact on oral production, while only 9.3% do not (Mean = 1.17). This indicates a strong consensus among participants regarding the detrimental effect of limited feedback on oral proficiency development in distance education settings. Universities should explore innovative solutions to facilitate regular and constructive feedback exchanges between teachers and students to enhance oral production skills effectively.

The fact that the standard deviation is relatively small, not surpassing 0.29 indicates agreement among the sample items. This is further validated by the Chi-Square's significance level being under 0.05.

8. Analysis of the 9th indicator: The processed data indicated the results shown in the following table:

Table 10: Analysis of the 9th indicator

Are the excessive remote assignments adequate for you?	Answers				Mean	Std. D	Degree	$\chi 2$	
	No		Yes						
	Fre	%	Fre	%	$\bar{x}$	$\sigma 2$	1.5→ ←	SigTeacher	SigStudent
	107	76.4	33	23.6	1.23	0.42	No	0.000	0.000



Source: Based on the outputs of SPSS.v27.

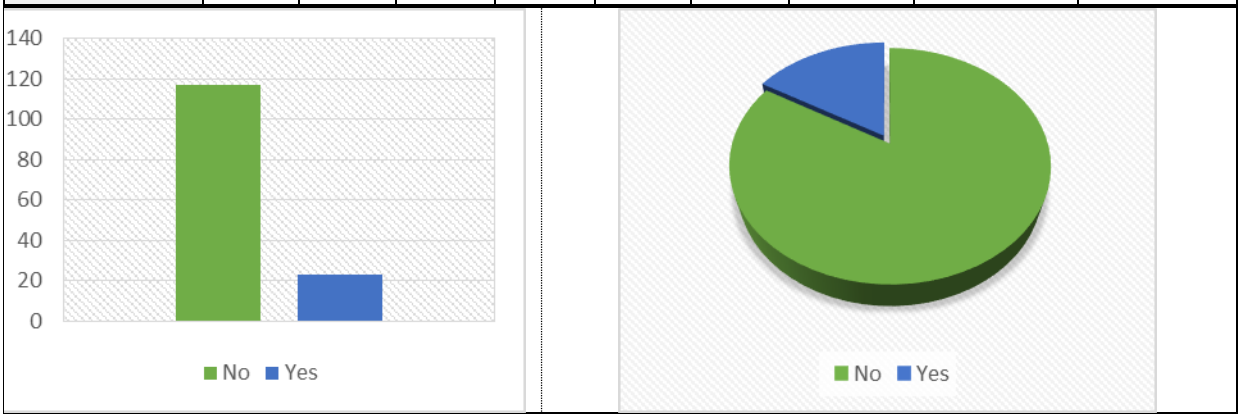
A significant 76.4% of respondents indicated that the excessive remote assignments are not adequate, while only 23.6% expressed satisfaction with them (Mean = 1.23). This suggests that the majority of participants find the workload of remote assignments to be overwhelming or insufficiently beneficial. Universities should consider reevaluating the quantity and nature of remote assignments to better meet the needs and capacities of students and instructors alike.

The standard deviation, which is relatively minor and does not go beyond 0.42, shows that there is an agreement among the sample items. This is confirmed by the Chi-Square showing a significance level lower than the standard 0.05.

09. Analysis of the 10th indicator: The processed data indicated the results shown in the following table:

Table 11: Analysis of the 10th indicator

Were you previously prepared for this unexpected situation?	Answers				Mean	Std. D	Degree	χ 2	
	No		Yes						
	Fre	%	Fre	%	$\bar{x}$	σ2	1.5→ ←	SigTeacher	SigStudent
	117	83.6	23	16.4	1.16	0.37	No	0.000	0.000



Source: Based on the outputs of SPSS.v27.

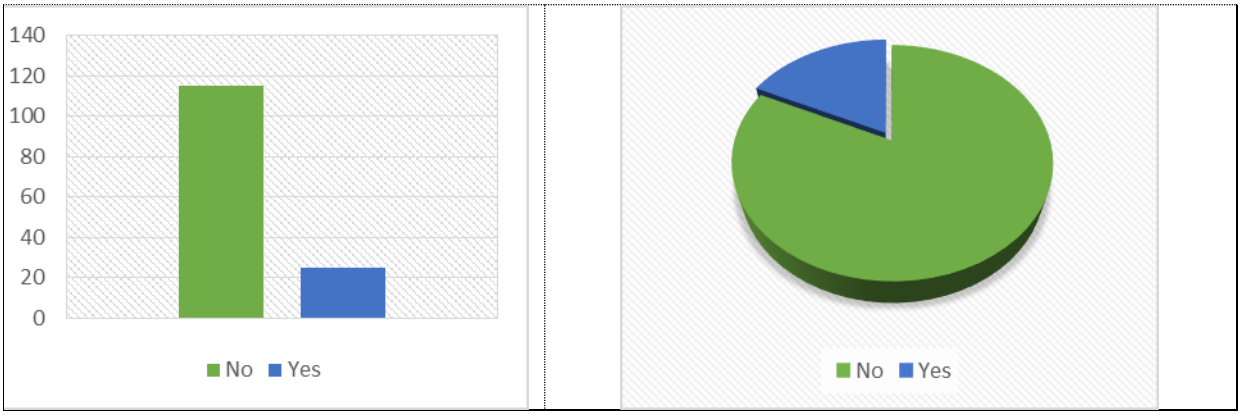
A significant 83.6% of respondents indicated that they were not previously prepared for this unexpected situation, while only 16.4% felt adequately prepared (Mean = 1.16). This suggests that the majority of participants were caught off guard by the unexpected circumstances, highlighting the need for better contingency planning and preparation in educational institutions. Universities should invest in proactive measures to ensure readiness for future disruptions and unexpected events.

A relatively small standard deviation, capped at 0.37, indicates consensus among the sample items. This is further affirmed by the Chi-Square's statistical significance falling below the conventional 0.05 mark.

10. Analysis of the 11th indicator: The processed data indicated the results shown in the following table:

Table 12: Analysis of the 11th indicator

Have you noticed an improvement in teaching and learning with this new approach to distance ?education	Answers				Mean	Std. D	Degree	χ 2	
	No		Yes						
	Fre	%	Fre	%	$\bar{x}$	σ2	1.5→ ←	SigTeacher	SigStudent
	115	82.1	25	17.9	1.17	0.38	No	0.000	0.000



Source: Based on the outputs of SPSS.v27.

A substantial 82.1% of respondents have not noticed an improvement in teaching and learning with this new approach to distance education, while only 17.9% reported observing such improvements (Mean = 1.17). This indicates a widespread perception that the transition to distance education has not resulted in significant enhancements in teaching and learning outcomes. Universities should address the identified challenges and explore strategies to optimize the effectiveness of distance education methods.

The standard deviation, which is relatively minor and does not go beyond 0.38, shows that there is an agreement among the sample items. This is confirmed by the Chi-Square showing a significance level lower than the standard 0.05.

11. Hypothesis Test Results: Through the study of the previous results, it is evident that there is an agreement between university professors, as providers of distance education, and university students, as recipients of this service, regarding the existence of many challenges and obstacles that make distance education fall short of achieving its desired outcomes. These challenges and obstacles are related to the lack of necessary resources for distance education. Additionally, this type of education is not considered a substitute for in-person education, which offers many advantages, the most important being the opportunity for unrestricted direct discussion. This is deemed a necessary condition for language acquisition, especially concerning oral communication skills, this confirms the validity of the hypothesis that states: "In e-learning, or distance education, the issue of acquiring scientific modules remains evident; this is likely due to the insufficiency of information and communication technologies for education (ICTE)".

Conclusion on Hypothesis

After a conceptual study of the hypothesis, and to verify it in order to confirm or refute it, we chose the questionnaire which was addressed to an appropriate sample of teachers and students of the urban technology management institute, this Questionnaire is processed using software (SPSS) which has been put to the test by an experiment.

1. These findings support the hypothesis:

"In e-learning, or distance education, the issue of acquiring scientific modules remains evident; this is likely due to the insufficiency of information and communication technologies for education (ICTE)."

2. Key Points Supporting the Hypothesis:

- Challenges in Distance Education: Both educators and students recognize the numerous challenges in distance education, reinforcing the notion that the current ICTE infrastructure is insufficient.

- Resource Deficiency: The lack of necessary resources is a significant barrier to the success of distance education, confirming that the existing ICTE does not adequately support the educational process.
- Importance of In-Person Interaction: The critical role of direct, unrestricted discussions in effective learning, particularly for language acquisition, underscores the limitations of current ICTE solutions in replicating the benefits of in-person education.

3. Implications

The validation of this hypothesis suggests a need for substantial improvements in ICTE to enhance the effectiveness of distance education. This could include:

- Increased Investment in Technology: Ensuring that both students and educators have access to the necessary technological resources.
- Enhanced Platforms for Interaction: Developing and implementing more sophisticated platforms that facilitate better interaction and communication, mimicking the advantages of in-person discussions.
- Training and Support: Providing comprehensive training for educators and students to effectively utilize ICTE tools and maximize their potential.
- By addressing these areas, the gap between the potential of distance education and its current shortcomings can be narrowed, leading to improved educational outcomes.

Recommendations

- It is useful to have a prospective vision of the school which is based on the concept of a computerized learning environment, which is also called a digital working environment.
- E-learning is not intended to supplant, but rather to accompany face-to-face teaching.
- The e-learning system must meet the requirements of proven economic legitimacy.
- To facilitate the tasks for teachers and students, in particular at graduation, it is necessary to introduce the (ICTT) into teaching from primary education.—
- Distance learning adapts perfectly to the vagaries of each student's daily life.
- Savings and knowledge can be acquired by learners compared to a face-to-face offer.

Acknowledgement

I would like to thank the teachers and students who contributed significantly to the completion of this research by putting forward their important points of view on the process of learning science subjects remotely and the obstacles that hinder it.

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