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The Development of ICTS and Their Effect on the Academic Learning of Higher Education Students at a Public University

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Abstract

The main objective of the scientific research article was to determine the development of ICTs and their effect on the academic learning of higher education students at a public university; for this purpose, a cross-sectional explanatory causal correlational study methodology was used, which was composed of a population of 335 students and as a sample 124 students were selected under a non-probabilistic sampling for convenience, through the use of ordinal logistic regression the results could be obtained which evidenced a sig.< 0.05 so it could be established under a Nagelkerke value of 0.980, The development of ICTs significantly affects 98% of the academic learning of higher education students, thus mentioning that the correct use and employment of information and communication technologies promote and enhance the academic learning that students perceive with a view to their pedagogical growth.

Keywords: *Academic Learning, Higher Education, ICTS*

INTRODUCTION

The purpose of this study is to show the impact of the use of information and communication technologies, since ICTs in the learning process serve as the main support tool for learning and teaching, so applying it to teaching can not only be a source of methods for teachers but also a source of motivation for students. because the use of ICT in education makes student learning more flexible, thanks to this it is possible to study anywhere and at any time, thanks to the fact that, in recent years, the use of the internet and mobile devices have been available to the majority of the population, especially university students (Marín, 2015).

At the national level, educational institutions need to optimally integrate the use of these ITs into their institutional strategic plans that include a diverse portfolio of knowledge (Cotrina, 2020), which is why Minedu has developed a strategic plan for the relevance and accessibility of basic services. services in your organizational plan. Bicentennial, which clearly establishes that education must be associated with technology (Deputy Minister Regulation No. 234, 2021). In Peru, university-level education is an essential requirement to integrate the use of ICT with teaching methods in different professional fields, considered from the perspective of strategic planning concepts, due to its importance in the training of professionals (Nakano, et al., 2018). Similarly, the use of ICT to support learning is being fully recognized, as students are moving away from using printed books to study on their own and increasingly consuming ICT-based information through various channels that facilitate learning. (Barbosa, 2021). However, this depends largely on the school's equipment and facilities for students, as well as the location of teachers and students (García, 2017).

According to the United Nations Children's Fund (UNICEF) in 2017, 71% of young people in the world between 15 and 24 years old access the Internet, which means that using this type of computer resource is part of their daily lives. They are integrated into the teaching and learning process to ensure that important learning outcomes are achieved. Likewise, one in three adolescents and children under 18 years of age has access to the Internet, which in many countries of the world has become an opportunity and, therefore, a

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source of many behavioral and behavioral problems; However, its importance for personal development is undeniable.

Correa (2018) sought to establish a relationship between the didactic use of ICT and meaningful learning in a higher education institution in Lima, demonstrating that the management of the use of ICT in education had a direct relationship with the learning of university students, achieving a significant result (p. = 0.000) using Spearman's ro. The main finding of this study is to highlight the importance of ICT for the meaningful learning of university teachers. According to Pérez et al. (2017) ICT in education have created new challenges not only in terms of forms of production, presentation, dissemination and access to knowledge, but have also created new conditions that allow the creation of educational environments that provide such opportunities for synchronous and asynchronous communication. Similarly, information technology has the characteristic of overcoming barriers of time and space in the work process.

In the same way, ICTs are known as the means capable of breaking down barriers of space and time in learning, in addition to this it allows to establish participations and achieve an exchange of information at any time to any place in the world, thus achieving that participants can work at an adequate pace. taking the ideal time to be able to review thoroughly before being able to share their opinions or information with other people (Alvarado, 2014; Chicher, 2013; Gutiérrez & Gómez, 2015).

Tello and Cascales (2105) point out that, although information and communication technologies play an important role in the educational field, their adequate and beneficial implementation depends not only on the educational centers, but also on the entire institutional structure. In the same vein, Cubillo et al. (2014) show that learning and research can be considered extremely simple tasks thanks to all the information available on the Internet and access to technological devices, but not all resources are suitable for all students. For this reason, societies based on science and technology need competent, critical, and creative professionals who know how to adapt to change, make decisions, identify useful and appropriate information, and know how to solve problems (Armenta, Salinas, & Mortera, 2013).

In the same way, Gutiérrez and Gómez (2015) establish that the use of a variety of electronic media is present in the daily life of each human being, thus establishing a globalized use, as the main means of communication and learning, promoting education in different areas. On the other hand, Vázquez and Cabrero (2015) establish that, as a result of the last few years, there has been a change in the paradigm of education in which learning only takes place in formal media.

Ruiz et al. (2014) refer to the fact that the use of ICT in education requires students to constantly search, analyze and compare information with existing reference knowledge and build ideas through communication, from there they lead to meaningful learning, that is, connecting new concepts or information. with what the student already knows and makes connections, that the new information must be able to correlate with the knowledge that the student has previously acquired, in the sense that the student must be inclined to learn, i.e., interested learning or similar, an active approach towards the learning process.

Students consider IT as an element of the learning process, they consider it as a resource that contributes to the expansion of knowledge. (Litbang et al., 2020). These technological tools complement effective, autonomous and flexible learning. (Barbosa et al., 2021). Over time, these tools become important resources which will serve in future pedagogical models (Sutrisno, 2020). For this reason, teachers need training in information technologies, using them to develop skills and improve the curriculum (Arriaga et al., 2021).

Thus, the development of the research article is justified in a theoretical way since various approaches and definitions of the related theories were used for the variable information and communication technologies and for the learning variable, allowing to know what is their effect of one on the other, followed by it is justified in a practical way, since, the results of the study will allow to know the degree of influence of the variable, allowing to solve the problem in higher education students, likewise, it is justified in a social way since it is expected that the study can be reflected in other higher education students allowing a better use or development of ICTs and thus achieve an improvement in the field of education for the purpose of

improving learning, Finally, it is justified methodologically, since instruments will be used, which will corroborate the hypothesis, allowing to establish the degrees of effect of one on the other.

In this way, the general hypothesis will be proposed: To determine the development of ICTs and their effect on the academic learning of higher education students of a public university, followed by the specific objectives of establishing the development of information and its effect on the academic learning of higher education students of a public university, To know the development of communication and its effect on the academic learning of higher education students of a public university, To identify the development of technology and its effect on the academic learning of higher education students of a public university.

Finally, it is proposed as a general hypothesis: The development of ICTs has a significant effect on the academic learning of higher education students at a public university.

METHODOLOGY

For the development of the article, an applied research was developed, since it was sought through theories and concepts, to solve a problem in order to corroborate the established hypotheses, in the same way a quantitative approach was used because the use of both descriptive and inferential statistics was used through the various tables, A non-experimental causal explanatory design was developed, since the variables were not manipulated, we only dedicated ourselves to observation, in addition, we sought to identify the effect of the ICT variable on the learning of higher education students, finally cross-sectional because the information was collected at a single time on the sample already chosen. (Hernández & Mendoza, 2018)

The study population was made up of 335 higher education students, having as inclusion criteria, 1st cycle students, enrolled students, and students without faults, as well as exclusion criteria, students with absences, students, from 2nd cycle onwards and students enrolled extemporaneously, being considered as the unit of analysis each student of 1st cycle of higher education of a public university; The sample was considered by 124 students, chosen through a non-probabilistic sampling for convenience, because we will intentionally choose the students we want to participate in the research.

As part of the analysis of the data and procedures, programs such as Microsoft Excel were used for the tabulation of the answers and Spss Statistics 27.0 for the verification of hypotheses and verification of the proposed objectives, thus developing the use of descriptive statistics, normality test and inferential statistics through ordinal logistic regression which will allow to verify the effect of one variable on the other. as a non-parametric statistical measure

RESULTS

Descriptive statistics

Table 1 ICT Development Level

			n	%
Variable	ICTs	Adequate	22	17.7
		Middle	82	66.1
		Inadequate	20	16.1
Dimension	Information	Adequate	21	16.9
		Middle	89	71.8
		Inadequate	14	11.3
	Communication	Adequate	20	16.1
		Middle	77	62.1
		Inadequate	27	21.8
	Technology	Adequate	22	17.7
		Middle	65	52.4
		Inadequate	37	29.8
		Total	124	100.0

Note. Retrieved from the Spss Program (2024)

For table 1, it could be observed that as the most outstanding value was a medium development of ICTs in 66.1%, followed by that, for the information, communication and technology dimensions, all were again in a medium development, these being 71.8%, 62.1% and 52.4% respectively

Table 2 Learning Level

			n	%
Variable	Learning	High	22	17.7
		Regular	84	67.7
		Low	18	14.5
Dimension	Comprehension	High	28	22.6
		Regular	69	55.6
		Low	27	21.8
	Motivation	High	26	21.0
		Regular	86	69.4
		Low	12	9.7
	Participation	High	26	21.0
		Regular	69	55.6
		Low	29	23.4
		Total	124	100.0

Note. Retrieved from the Spss Program (2024)

Likewise, for table 2, it was found that the learning variable was at a regular level considering 67.7%, followed by it was also found that the dimensions, comprehension, motivation and participation, were at a regular level with 55.6%, 67.4% and 55.6% respectively

Table 3 Normality test for variables

Normality tests			
	Kolmogorov-Smirnova		
	Statistical	Gl	Gis.
ICTs	,196	124	<,001
Learning	,099	124	,004

Note. Retrieved from the Spss Program (2024)

For the normality test, we interpreted the Kolmogorov-Smirnov test because there was a sample greater than 50, likewise, a sig. less than 0.05 was evidenced, so we can mention that the data do not follow a normal distribution, employing the use of a non-parametric test such as ordinal logistic regression.

Inferential statistics

OG: To determine the development of ICTs and their effect on the academic learning of higher education students at a public university.

Table 4 ICTs and their effect on academic learning

Model tuning information					Pseudo R square	
					Cox and Snell	0.801
Model	Logarit. Likelihood -2	Chi-square	Gl	Gis.		
Intersection only	200.499				Nagelkerke	0.980
Final	.000	200.499	2	<0.001	Mcfadden	0.950

Note. Retrieved from the Spss Program (2024)

For table 4, it was possible to know that there was a sig. less than 0.05, which is why the Ho is rejected, mentioning that: the development of ICTs has a significant effect on the academic learning of higher education students of a public university; all this supported by the Nagelkerke value of 0.980, indicating again that, ICTs affect academic learning by 98%; all this coincides with Marín (2015) who mentions that the use of ICT in education makes student learning more flexible and supported by (Alvarado, 2014; Chicher, 2013; Gutiérrez & Gómez, 2015). He mentions that ICTs are known as the means capable of breaking down barriers of space and time in learning, in addition to this it allows to establish participation and achieve an exchange of information at any time to any place in the world

SO 1: Establish the development of information and its effect on the academic learning of higher education students at a public university

Table 5 Information Dimension and its Effect on Academic Learning

Model tuning information					Pseudo R square	
Model	Logarit. Likelihood -2	Chi-square	Gl	Gis.	Cox and Snell	0.580
Intersection only	119.228				Nagelkerke	0.710
Final	11.578	107.650	2	<0.001	Mcfadden	0.510

Note. Retrieved from the Spss Program (2024)

Similarly, for table 5 it was possible to know that there was a sig. less than 0.05, which is why the Ho is rejected, mentioning that: the development of the information has a significant effect on the academic learning of higher education students of a public university; all supported by the Nagelkerke value of 0.710, indicating again that the development of information affects academic learning in 71%; this is supported by Cubillo et al. (2014) who show that learning and research can be considered extremely simple tasks thanks to all the information available on the Internet and access to technological devices, in addition to Tello and Cascales (2105) who point out that information and communication technologies play an important role in the educational field.

OE 2: To know the development of communication and its effect on the academic learning of higher education students at a public university

Table 6 Communication dimension and its effect on academic learning

Model tuning information					Pseudo R square	
Model	Logarit. Likelihood -2	Chi-square	Gl	Gis.	Cox and Snell	0.606
Intersection only	127.100				Nagelkerke	0.741
Final	11.679	115.421	2	<0.001	Mcfadden	0.547

Note. Retrieved from the Spss Program (2024)

Likewise, for table 6 it was possible to know that there was a sig. less than 0.05, which is why the Ho is rejected, mentioning that: the development of communication has a significant effect on the academic learning of higher education students of a public university; all supported by the Nagelkerke value of 0.741, indicating again that the development of communication affects academic learning in 74.1%; supported by Gutiérrez and Gómez (2015) establish that the use of a variety of electronic media is present in the daily life of each human being, thus establishing a globalized use, as the main means of communication and learning, promoting education in different areas; supported by Ruiz et al. (2014) who refer to the use of ICT in education requires students to constantly search, analyze and compare information with existing reference knowledge and build ideas through communication, from there leading to meaningful learning.

SO 3: Identify the development of technology and its effect on the academic learning of higher education students at a public university

Table 7 Technology dimension and its effect on academic learning

Model tuning information					Pseudo R square	
					Cox and Snell	0.680
Model	Logarit. Likelihood -2	Chi-square	Gl	Gis.		
Intersection only	149.272				Nagelkerke	0.832
Final	8.014	141.258	2	<0.001	Mcfadden	0.669

Note. Retrieved from the Spss Program (2024)

Finally, for table 6 it was possible to know that there was a sig. less than 0.05, which is why the Ho is rejected, mentioning that: the development of technology has a significant effect on the academic learning of higher education students of a public university; all supported by the Nagelkerke value of 0.832, indicating again that the development of technology affects academic learning by 83.2%, supported by Arriaga et al. (2021), who mention that teachers need training in information technologies, using them to develop skills and improve the curriculum; finally corroborated by Barbosa et al. (2021) who say that these technological tools complement effective, autonomous and flexible learning; also supported by Sutrisno (2020) which establishes that, over time, these tools become important resources which will serve in future pedagogical models.

CONCLUSIONS

As a first conclusion, it can be mentioned as the most outstanding data that the ICTs, developed by higher education students, were of average level established by 66.1%; Likewise, the learning of these was considered at a regular level with 67.7%, establishing as the main point that the correct use of information and communication technologies allow the student to facilitate their tasks within the university centers, likewise, they promote knowledge and the acquisition of information for correct learning and better teaching.

Following this, it was possible to conclude based on what is visualized in tables 4, 5, 6 and 7 that, based on a sig. less than 0.05, it was possible to establish that the development of ICTs, information, communication and technology have a significant effect on the academic learning of higher education students. indicating again that ICTs affect academic learning in 98% and their dimensions affect 71%, 74.1% and 83.2% respectively.

Finally, it is concluded based on the analysis of the theories evidenced by the various authors who, for the most part, consider ICTs as the digital resource capable of allowing the acquisition of knowledge and responsible for the main factor as a determinant of correct learning within students.

RECOMMENDATION

Finally, it is recommended to use computer programs, which allow promoting the issue of the correct and appropriate use of digital media in order to optimize development with respect to the learning that students usually perceive within their institutions.

Likewise, it is recommended to constantly evaluate students and teachers every 2 months through tests, thus allowing not only to expect the student to know or manage to know what is necessary, but also allowing in one way or another, to know the capacity of the educator who will be responsible for the development of learning inside and outside the classroom.

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