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PEDAGOGICAL USE OF ICT IN TEACHING PERFORMANCE IN A UNIVERSITY IN PERU

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INTRODUCTION

Rodríguez and Marín (2023) specify that the work in university teaching is increasingly demanding, since the professor's expert knowledge of the theoretical and practical content that allows him or her to transmit knowledge is no longer enough, it is now a priority to carry out research that must be published in journals (local, national or international), the application of teaching strategies that are based on the application of information and communication technologies, among others; therefore, Segovia-Quesada *et al.* (2020), their work must necessarily transcend the content provided in the classroom.

Emili (2019), García (2009) and De Pablos (2009) highlight the relevance that university teachers should have a solid training in the use of ICT with a pedagogical objective, mainly because their young students already have computer skills, and they definitely have the expectation that technology will be used for their training. given that the labor market is competitive, and it is required that the university provides professional training, where the technological component is transversal.

In Peru, Education Law 30220 creates an entity that is responsible for supervising the educational quality provided by universities (SUNEDU), which has developed a model made up of eight basic quality conditions, which has made it possible to evaluate all private and public universities in the country, where Basic Condition V evaluates that universities must be made up of qualified teachers. which implies that the use of ICT to carry out teaching is key to transmitting knowledge and strengthening its performance. Although 64.2% of the universities evaluated by SUNEDU have already managed to obtain institutional licensing, the current situation after the Covid-19 pandemic has exposed problems related to connectivity in several of them, which implies the lack of an institutional platform that is frequently used by teachers to provide educational services. thus affecting teacher performance.

What was described in the previous paragraph was evidenced at the Jorge Basadre Grohmann National University of Tacna (Peru), in terms of problems related to the application of the virtual modality, which had to do with the lack of pedagogical skills for the application of ICTs, significantly affecting their work as a teacher; which forced a rapid adaptation of the teacher to this virtual teaching scenario, in addition to the fact that being an institutionally licensed university, it should already be understood that the use and mastery of ICT, by professors, should be habitual and in accordance with the expectations of their students.

The general objective is to determine how the pedagogical use of ICT influences the performance of teachers in a Peruvian university; and the specific objectives, to analyze how the pedagogical use of ICT influences the

pedagogical capacities, emotionality, responsibility, and interpersonal relationships of teachers at a Peruvian university.

Perrenoud (2004) cited by Ramos and Márquez (2023), describes the relevance of competence for the use of new technologies that serve as support for planning and implementing strategies for the teaching process in university teaching, therefore, the teacher must have the skills and abilities to transmit knowledge supported by the use of ICTs. Therefore, this research is relevant, since it is key to diagnose the level of performance of university teachers, and to specify the impact of having the skills to apply ICTs, which allows prioritizing training to strengthen the digital capacities of teachers, leading to the existence of an improvement in their development with respect to transmitting knowledge through the classroom.

With regard to the theoretical basis of the variable "Pedagogical use of ICTs", what was expressed by Cabero (2010) stands out, who points out that ICTs are a set of tools that allow an individual to interact with other people, through images, chat, email, etc., their main characteristics being: The raw material is information (immateriality), connectivity is promoted (interconnection), there is frequent communication (Interactivity), and data and information are shared in real time (Instantaneity).

Gil del Pino *et al.* (2023) defines ICT as a set of various techniques and elements that are applied to process and transmit information, which can be done in various ways, such as data, voice, images, others; in the case of university teaching, the teacher is the main protagonist, since he or she has to strengthen his or her pedagogical capacities regarding the use of technology to teach classes.

Kay and Knaack (2009) highlight that the process of teaching and learning is increasingly supported by the use of ICTs, since it is effectively possible to facilitate learning in a more effective way compared to the traditional method, which is why the teacher must adapt to the new challenges demanded by technology. Guerrero and Faro (2012) specify that teachers must constantly reinforce their capacities related to the use of various technological resources that allow them to transmit their knowledge, since students are expecting that learning will be generated based on the use of virtual platforms and the existence of greater synchronous communication; for which the active role of the teacher is key.

Izquierdo and Pardo (2007) cited by Yana (2023), point out that the use of ICT in higher education has made it possible to demonstrate that it is necessary to transform the way of implementing methodological work, for which the training of teachers must assume biased challenges with the acquisition of digital skills for the teaching of their subjects. despite the existence of a certain level of resistance or attitudes that do not contribute to their frequent use.

Llorente *et al.* (2015) specify that the relationship between teachers and their students is changing, since in the learning environment it is technologies that acquire a greater role, mainly in the method of teaching and the characteristics of the tasks; therefore, one of the basic challenges is the improvement of the teacher's competencies, which should be considered as institutional objectives, which is why Cabero and Díaz (2014) specify the characteristics that should be activities in the search for the strengthening of the teachers' capacities in the use of ICT, there are:

- Minimum competencies for the instrumental management of the different ICTs.
- Decoding of messages that use ICTs.
- ICTs are a means to achieve proposed curricular objectives.
- The different actions that are proposed when making use of ICTs allow the obtaining of a series of differentiated socio-cognitive products.
- ICTs, if they develop specific cognitive skills, become a teaching-learning resource.
- The teacher must become a producer of ICTs. The beginning is marked by consumerism; however, the ideal of production must be achieved.
- The teacher must become a curator of content, typical of a selection and evaluation of ICTs.
- It is a realistic resource, which leads education to align itself with the perspective of the new knowledge society.
- Not only is there a resource, ICT shows us a range of strategies that will allow the teacher to organize the content to better obtain results.
- ICTs become an allied resource for teachers, and the creation of new training spaces, denying rejection and permanent submission.
- It not only becomes a resource to obtain results, but also to obtain them.
- Different models of synchronous and asynchronous communication are established, creating different communication scenarios with ICTs.

Albarracín and González (2016) carried out research related to the relationship between the use of ICT by teachers and their level of teamwork, from which the following dimensions have been considered for this research, we have:

- Training in the use of ICT: It involves analyzing the set of trainings, courses, talks, others, that the teacher may have followed, referring to the application of ICT, specifically for the teaching process.
- Use of ICT in the syllabus: This refers to the fact that, if the teacher prioritizes the use of ICT in the planning of their classes, and as a transversal tool in teaching.
- Impulse to use ICT: It implies that if the directors of the educational institution encourage their teachers to prioritize the application of ICT in the learning environment.

With regard to the theoretical basis of the variable "Teaching performance", Urdaneta and Urdaneta (2013) express themselves on performance, who define it as a set of behaviors that are carried out by a person in order to achieve institutional goals, for which the competencies required by the position must be available. which will ensure compliance with the entity's expectations.

Also what was expressed by Toala *et al.* (2017) who highlight that the relevance of the worker's work is in relation to achieving the objectives of the entity, but for this, it details a set of factors that are required for the existence of adequate performance, there are: Motivation, positive work environment, clarity in objectives and goals, recognition for the achievement of tasks, participation and professional development.

The Ministry of Education of Peru (2012) points out in its publication related to adequate teaching performance, that teaching requires a constant preparation of the teacher's skills that allows constant interaction with students, where knowledge is transmitted based on what is planned for a given course.

Estrada (2010) points out that the teacher's performance represents the axis that moves the various stages that consider the training of people in an educational system; and it encompasses the set of strategies applied by the teacher to transmit content, which allow the student to have access to new knowledge.

González (2014) analyzes the different roles of the teacher, of which the following characteristics are described:

a) Planner: It implies that the teacher must detail the objectives that he intends to achieve with the course he will teach, establish the activities for each of the didactic units to be developed, and in each of them he must specify the pedagogical strategies to be used to transmit knowledge; therefore, planning allows for rational choice of content, methodology, and ways of evaluating learning; Specifically, the cognitive, procedural and attitudinal aspects that will be promoted in each unit must be specified.
b) Facilitator: It implies that the teacher dedicates his work to transmitting existing knowledge, in order to provide his students with abundant information that allows him to develop positions on life, on society, others; Therefore, an important aspect of the teacher involves his role as pedagogical accompanist, where he focuses his activities on providing the tools to generate the construction of knowledge in the students, for which there must be frequent participation in classes.
c) Evaluator: It implies that the teacher uses various strategies to evaluate whether their students are indeed able to learn, that is, that they are able to acquire the previously planned competencies and skills.

Reto (2018) carried out a research where he sought to relate the climate of the entity with the performance of the teacher in a university, from which the following dimensions have been considered for the analysis of the study variable, we have:

- Pedagogical skills: It involves developing the teaching plan, where the objectives to be achieved are detailed, defining the strategies to be used to transmit knowledge, and the precision of the way of evaluating.
- Emotionality: It mainly covers if there is a vocation for service, if there is satisfaction with the teaching work.
- Responsibility: It implies whether there is punctuality and compliance with what is proposed in the class plan in each of the units of study.
- Interpersonal relationships: It implies if there is frequent interaction with students, if there is knowledge about the various problems that students go through on academic and non-academic aspects.

METHODS

Regarding the methodological aspects of the research, it is specified that the type is applied, the design is non-experimental, explanatory in scope, the data are cross-sectional at a moment in time (Hernández *et al.,* 2014), the census sample is 94 professors from the Jorge Basadre Grohmann National University of Tacna (Peru); The technique was the survey, as far as the instrument is concerned, it was the questionnaire, being: For the analysis of the level of pedagogical use of ICT and for the analysis of the teacher's performance.

The criterion of the Expert Judgment was used to validate the instruments in terms of their content, obtaining that they are suitable to be used; for reliability, Cronbach's alpha was used with a pilot test of 10 teachers, from which: Variable "Pedagogical use of ICT" was obtained 0.839 and for the variable "Teacher performance" 0.939 was obtained; since these values exceed 0.80, it is concluded that the instruments are suitable for use in the collection of field data (George & Mallery, 2003).

The questions of the questionnaires have 05 alternatives, for their analysis the Likert scale was used, being its options: "Never" (value = 1), "Almost never" (value = 2), "Sometimes" (value = 3), "Almost always" (value = 4) and "Always" (value = 5). For the analysis of the variables and their dimensions, given that the teachers' perception has been used, the following levels are proposed: Inadequate, regular and adequate, where the extremes of the intervals are the following (of equal amplitude); the operationalization of the variables being:

Table 1

Dimensions – indicators for each variable

VARIABLE	CONCEPT	DIMENSION	INDICATOR
Independent variable: Pedagogical use of ICT	It is the use of ICT as support tools for the optimal delivery of classes (Gil del Pino *et al.*, 2023).	- Training in the use of ICT.	- ICT training, self-taught learning.
		- Use of ICT in the syllabus.	- Transversality of the use of ICTs, tasks using ICTs.
		- Impulse to use ICTs.	- Procedures for the use of ICT, laboratories implemented.
Dependent variable: Teaching performance	It encompasses the fulfillment of the functions to which the teacher has committed, as a result of the employment relationship with the educational institution (Aquinto, 2019).	- Pedagogical capacities.	- Objectives, organization of contents pedagogical vocation.
		- Emotionality.	- Self-esteem, motivates, solves doubts.
		- Responsibility.	- Participate in activities, punctuality, plan classes.
		- Interpersonal relations.	- Human relations, cordiality, respect.

Note. Own

RESULTS

Table 2 describes the results of the variable "Pedagogical use of ICTs"; from which it can be seen that 76.6% of the teachers consider their level of use of technology for their academic work to be at an adequate level, and 23.4% indicate that it is of a regular level; therefore, most teachers consider that as time goes by there is a greater use of technological tools for the This is well accepted by their students, as they recognize that they need to master those tools necessary for their future professional work.

Table 2

Results of the independent variable "Pedagogical use of ICT"

Level	Teacher	Percentage
Inadequate	0	0,0
Regular	22	23,4
Adequate	72	76,6
Total	94	100,0

Note. Questionnaire "Pedagogical use of ICTs"

Table 3 presents the summary of the descriptive behavior of the dimensions that make up the independent variable; from which it can be seen that the most highlighted by teachers is "Training in the use of ICT", followed by "Impulse to use ICT", finally the aspect to be improved is the "Use of ICT in the syllabus".

Table 3

Results of the independent variable "Pedagogical use of ICT" (by dimension)

Dimension		Teacher	Percentage
Training in the use of ICT	Inadequate	0	0,0
	Regular	25	26,6
	Adequate	69	73,4
Use of ICT in the syllabus	Inadequate	3	3,2
	Regular	44	46,8
	Adequate	47	50,0
Impulse to use ICTs	Inadequate	1	1,1
	Regular	43	45,7
	Adequate	50	53,2

Note. Questionnaire "Pedagogical use of ICTs"

Table 4 describes the results of the variable "Teaching performance"; from which it can be seen that 87.2% of the teachers consider their work performance in the faculty to be of an adequate level, and 12.8% indicate that it is of a regular level; therefore, most of the teachers emphasize that they satisfactorily comply with the teaching of their courses. considering the content of its syllables, supported by technological tools, others, but that there are some aspects to strengthen such as promoting more research activities.

Table 4

Results of the dependent variable "Teacher performance"

Level	Teacher	Percentage
Inadequate	0	0,0
Regular	12	12,8
Adequate	82	87,2
Total	94	100,0

Note. Questionnaire "Teaching performance"

Table 5 presents the summary of the descriptive behavior of the dimensions that make up the dependent variable; from which it can be seen that the most highlighted by teachers are "Interpersonal Relationships", followed by "Emotionality", "Responsibility", and finally the aspect to be improved is "Pedagogical Skills".

Table 5

Results of the dependent variable "Teacher performance" (by dimension)

Dimension		Teacher	Percentage
Pedagogical skills	Inadequate	0	0,0
	Regular	22	23,4
	Adequate	72	76,6
Emotionality	Inadequate	2	2,1
	Regular	13	13,8
	Adequate	79	84,0
Responsibility	Inadequate	0	0,0
	Regular	16	17,0
	Adequate	78	83,0
Interpersonal relations	Inadequate	0	0,0
	Regular	12	12,8
	Adequate	82	87,2

Note. Questionnaire "Teaching performance"

To contrast the general objective, Table 6 presents the report of the ordinal logistic regression model, from which a chi-square value = 34.559 (p = 0.022) was obtained, which implies that the use of ICT influences teaching performance; this is complemented by the value of the Nagelkerke coefficient = 0.577. which implies that 57.7% of the variations in the level of teacher performance are generated by the use of ICT for their academic activities.

Table 6

Overall Objective Contrast

Model Adjustment

Model	Logarithm of Likelihood -2	Chi-square	Gl	Gis.
Intersection only	45,020			
Final	10,421	34,599	20	0,022

Pseudo R2

Cox and Snell	0,308
Nagelkerke	0,577
Mcfadden	0,482

Note. Both quizzes

To contrast the first specific objective, Table 7 presents the chi-square value = 47.183 (p = 0.001), which implies that the use of ICT influences the pedagogical capacities of the teacher; this is complemented by the value of the Nagelkerke coefficient = 0.595, which implies that 59.5% of the variations in the level of pedagogical skills are generated by the use of ICT for teaching activities.

Table 7

Contrast of the first specific objective

Model Adjustment

Model	Logarithm of Likelihood -2	Chi-square	Gl	Gis.
Intersection only	62,258			
Final	15,075	47,183	20	0,001

Pseudo R2	
Cox and Snell	0,395
Nagelkerke	0,595
Mcfadden	0,461

Note. Both quizzes

To contrast the second specific objective, Table 8 presents the chi-square value = 40.846 (p = 0.004), therefore, the use of ICT influences the teacher's emotionality; this is complemented by the value of the Nagelkerke coefficient = 0.556, which implies that 55.6% of the variations in the level of emotionality are generated by the use of ICT for teaching activities.

Table 8

Contrast of the second specific objective

Model Adjustment

Model	Logarithm of Likelihood -2	Chi-square	Gl	Gis.
Intersection only	67,525			
Final	26,680	40,846	20	0,004

Pseudo R2	
Cox and Snell	0,352
Nagelkerke	0,556
Mcfadden	0,433

Note. Both quizzes

To contrast the third specific objective, Table 9 presents the chi-square value = 50.157 (p = 0.000), which implies that the use of ICT influences the teacher's responsibility; this is complemented by the value of the Nagelkerke coefficient = 0.691, which implies that 69.1% of the variations in the level of responsibility are generated by the use of ICT for teaching activities.

Table 9

Contrast of the third specific objective

Model Adjustment

Model	Logarithm of Likelihood -2	Chi-square	Gl	Gis.
Intersection only	59,355			
Final	9,198	50,157	20	0,000

Pseudo R2	
Cox and Snell	0,414
Nagelkerke	0,691
Mcfadden	0,585

Note. Both quizzes

To contrast the fourth specific objective, Table 10 presents the chi-square value = 52.668 (p = 0.000), which implies that the use of ICT influences the teacher's interpersonal relationships ; this is complemented by the value of the Nagelkerke coefficient = 0.803, which implies that 80.3% of the variations in the level of interpersonal relationships are generated by the use of ICT for teaching activities.

Table 10

Contrast of the fourth specific objective

Model Adjustment

Model	Logarithm of Likelihood -2	Chi-square	Gl	Gis.
Intersection only	58,451			
Final	5,782	52,668	20	0,000

Pseudo R2

Cox and Snell	0,429
Nagelkerke	0,803
Mcfadden	0,734

Note. Both quizzes

DISCUSSION

Considering the results obtained regarding the significant influence of the pedagogical use of information and communication technologies on their performance in pedagogical tasks and interaction with their colleagues and university authorities, evidenced in the chi-square value = 34.559 (p = 0.022) and the Nagelkerke coefficient = 0.577; this implies that if it seeks to improve the work development of the teacher, it should necessarily be considered to empower oneself more with various technological tools that complement educational content; which will be well perceived by university students, who already have the skills to handle various computer tools in their daily lives.

These results are consistent with those found by Ochoa and Silva (2016) who conclude that it is necessary to guide that there are new ways for the development of educational practice, such as computer platforms, where university teachers must know how to adapt to respond to the demands of the market and their students; since it was found that 76.6% of university teachers consider their level of use of technology to be at an adequate level for their academic work.

Similarly, there is agreement with the results found by Gómez *et al.* (2015), who conclude that university teachers highlight that they are trained to use ICTs, but recognize that they must strengthen their skills for the use of pedagogical platforms; since it was found that 73.4% of university teachers consider that they have adequate training to use technological tools in their personal lives, labor, others.

It also coincides with the values obtained by Vásquez (2019), who concludes that there is a positive and moderate relationship (r = 0.616 and p = 0.004) between the application of the benefits of ICT and the performance of teaching staff; since in the present work it was found that the pedagogical use of ICT by university teachers does significantly influence their class performance.

Similarly, with the results of Ríos (2018), who concludes that there is a moderate and positive relationship between the teacher's use of ICT and the communication of learning (Rho = 0.453 and p = 0.000); since it was found that the use of ICT by the teacher does influence their performance in classes.

On the contrary, it is specified that there is a discrepancy with the results of Diez (2016) who concludes that there is no relationship between the use of ICT and the performance of personnel; given that in the work carried out it was found that there is an influence of the use of ICT by the teacher on his performance in classes, which implies that there is necessarily a relationship between these variables.

With respect to the work of Yapu (2021), it is specified that there is agreement, since he concludes that 62.9% of teachers consider that their performance is adequate; since it was found that 87.2% of university professors qualify their work development in the faculty as an adequate level, since they comply with the content of the syllabus supported by the application of technological tools.

CONCLUSIONS

- The pedagogical use of ICT influences the teacher's performance; given that a chi-square value = 34.559 (p = 0.022), and a Nagelkerke coefficient = 0.577 were obtained; in addition, 76.6% of the teachers consider their level of use of technology for their academic work to be adequate, the most outstanding dimension

being "Training in the use of ICT"; and 87.2% describe their work development in the faculty as adequate, the most prominent dimension being "Interpersonal Relationships".

- The pedagogical use of ICT influences the pedagogical capacities of the teacher; since a chi-square value = 47.183 (p = 0.001), and a Nagelkerke coefficient = 0.595 were obtained;therefore, it is suggested that teachers improve their motivational teaching strategies in addition to planning a greater use of ICT in the content of their teaching units, which will allow the way to reach their students with the support of the use of virtual platforms to be more efficient.
- The pedagogical use of ICT influences the teacher's emotionality; given thata chi-square value = 40.846 (p = 0.004), and a Nagelkerke coefficient = 0.556 were obtained; therefore, it is suggested that the teacher focus on strengthening their strategies for seeking additional and updated information on the subject of classes, which allows them to resolve students' doubts in a more forceful way. even if it is during hours outside of class, this will allow the way to reach their students to be more efficient with the support of the use of virtual platforms.
- The pedagogical use of ICT influences the responsibility of the teacher; sincea chi-square value = 50.157 (p = 0.000), and a Nagelkerke coefficient = 0.691 were obtained, therefore, it is suggested that the teacher be characterized more by participating in various committees of the faculty that seek to improve the educational service, and improve the strategy of monitoring the evolution of the learning of each of their students through the use of ICT. this will allow the way to reach their students to be more efficient with the support of the use of virtual platforms.
- The pedagogical use of ICT influences the teacher's interpersonal relationships; given thata chi-square value = 52.668 (p = 0.000), and a Nagelkerke coefficient = 0.803 were obtained; therefore, it is suggested that the teacher promote a greater rapprochement with his students to strengthen confidence in learning, and at the same time promote the development of research in his students. this will allow the way to reach their students to be more efficient with the support of the use of virtual platforms.

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