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DIGITAL COMPETENCIES OF THE TEACHER IN MEANINGFUL LEARNING IN A HIGHER EDUCATION INSTITUTION IN PERU, 2024

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ABSTRACT
The objective of the research is to determine the influence of the teacher's digital competencies on meaningful learning in a Higher Education Institution in Peru; The design is non-experimental, applied, explanatory level, cross-sectional data, the population is 120 students and the sample is 92, the technique is the survey, the instrument is the questionnaire and the approach is quantitative. It was found that 78.3% of students perceive the digital competencies of their teachers at a regular level, the most prominent dimension being "Informational Competence"; and 64.1% consider their significant learning to be at a regular level, where the most highlighted dimension is the "Relationship between previous knowledge and new knowledge." It was concluded that there is a significant influence of the teacher's digital competencies on the meaningful learning of their students, given the chi-square value = 55.944 (p = 0.000), and the Nagelkerke R^2 = 0.592; In addition, there is influence of the dimensions of the independent variable on the dependent variable.
Keywords: Digital skills, meaningful learning, teacher, teaching process.

INTRODUCTION

Serafini & Cuenya (2020) describe that currently educational training requires a greater role for the protagonist, for the generation of their learning, where it is key to know how to motivate them so that this previous knowledge appears, and that they manage to relate it to new knowledge, which therefore allows meaning to what is being learned and that it is evidenced; where the conducive environment and the existence of a working atmosphere in accordance with educational demands play an important role.

The challenge to generate learning is the generation of a significant situation, which is designed based on the needs and interests of the student, and based on this the teacher establishes a strategy so that competencies can be developed, when it is intended to provide a solution to the real situation that arises; therefore, it is important that the teacher manages to direct the student's emotions to the achievement of the objectives of the units of study (Oliveros, 2018).

In Peru, the design of the national curriculum is based on the constructivist approach, where meaningful learning is built on the basis of previous knowledge, which the student must be able to relate to allow the creation of significance; but the results of the sample evaluation developed by MINEDU in 2022 show that the vast majority of students are in the beginning and process stages, which is very worrying, since despite the millions of soles invested in the education sector, the improvement in learning is not noticeable.

In the case of the department of Tacna, despite the fact that it has the best grades in the census evaluations, with respect to reading comprehension and mathematical reasoning, there are many aspects to improve, such as teachers having a better level of digital skills, which allows them to take advantage of the benefits of ICT and educational platforms to generate meaningful learning. as requested by the national curriculum; specifically, this is evidenced in a Public Higher Education Institution that presents deficiencies in the learning levels of its students, a probable factor being the lack of optimal digital skills for the teaching of classes.

Therefore, the general objective was to determine the influence of the teacher's digital competencies on meaningful learning in a Public Higher Education Institution in Peru; the specific objectives being to analyze the influence of the technological, informational and pedagogical competence of the teacher on significant learning in a Public Higher Education Institution in Peru.

With regard to the theoretical bases of the independent variable "Digital Competences", the definitions of Gonzales *et al.* (2018), who point out that it is the capacity that allows the appropriate use of technological tools, in order to generate a working and collaborative relationship, based on contextual autonomy; that of UNESCO (2018), who argues that it is a set of capacities that allow the use of digital devices in pedagogical work, it also develops creative work in the interaction of students to fulfill their school obligations; and that of Gutiérrez (2014), who points out that it is a set of knowledge, skills, and behaviors that allow the individual to efficiently apply various technological resources to obtain information that contributes to the transformation of knowledge.

The National Institute of Technologies and Teacher Training – INTEF (2017), is a Spanish entity that has developed a reference framework that allows a diagnosis to be made, to subsequently develop improvements focused on the digital skills that should characterize teachers, in order to better generate knowledge in students. taking advantage of technological benefits; which considers five areas of competence, there are:

- Informs and informs informationally: It involves browsing, searching and filtering information and digital content.
- Communicate and collaborate: Involve interaction through digital technology, share information, participate online, collaborate on digital channels, and manage digital identity.
- Create digital content: It involves developing content, programming, integration and copyright.
- Security: Encompasses the protection of devices, data, and digital identity.
- Solve problems: It involves addressing technical aspects, innovates, identifies gaps and identifies technological needs.

For its analysis, the research of Cutipa (2022) was considered, who analyzes the digital competencies of teachers in a public educational entity, the dimensions he considered being the following:

a) Technological competence: It involves the use of hardware and software for mainly academic reasons; its indicators are: Explains functions, installs software, edits documents, updates experiences.
b) Informational competence: It implies that it is the ability to search for and share information; its indicators are: Searches, analyzes, organizes and selects information.
c) Pedagogical competence: It implies taking advantage of ICT for educational purposes; its indicators are: Favors learning, uses strategies, designs, uses ICTs, management of tools.

With regard to the theoretical bases of the independent variable "Meaningful learning", it is specified that the pedagogical approach behind it is constructivism, which maintains that the practice of teaching and learning must be based on constructing knowledge through mental schemes; these positions are proposed and developed by Piaget, Vigotsky, and Brunner, which are referenced by Márquez (2019), where the central thing is that individuals have the ability to build their learning, in addition to requiring students to be able to interact in society. Therefore, the person is conceived as a purely social and cultural being, which implies that he or she is always impacted by his or her environment, by his or her reality, by other people; in this regard, Restrepo (2017) highlights that the use of this approach implies the delivery of resources to the student, which allow them to be trained in order to build their own procedure, in order to face the various problems, generating solutions and continue learning continuously, therefore, the student is the protagonist of learning.

This theory is developed by Ausubel (1963), as a proposal that criticizes the behavior supported by behaviorism, in which the protagonist is the teacher and the role of the student is a passive behavior to learn, in addition to privileging memory; that is why it is proposed that the role of the student should be more protagonist and active in learning, where discovery is the method for learning, which will later be preserved for life (Moreira, 2018).

The definition provided by Garcés *et al.* (2019), who argue that a significant situation involves selecting or designing situations, which arise from student interests and that this provides the option to learn; in addition, a connection is generated between previous knowledge (anchor ideas) and new knowledge, which causes a challenging situation, and when it is resolved, progress is presented; Altamirano (2018) points out that for the generation of meaningful learning, the student already has prior knowledge, which is directed towards the formation of a new new concept,

thus modifying their cognitive structure, where the role of the teacher is that of a mediator, and focuses on locating and distributing material that serves the student to discover and build, thus, it applies strategies to explore, observe, compare, others; and Moreira (2018) points out that meaningful learning is a process that is based on interactions that contribute to the restructuring of cognitive schemes, where previous knowledge is explained by the student according to their diverse experiences, and they are impacted by new materials that promote the construction of knowledge.

For the respective analysis, the research of Flores (2022) was considered, who focuses on analyzing significant learning from the perspective of the student in a public educational entity, the dimensions used being:

a) Previous experiences: It implies the previous knowledge that characterizes the person on a certain topic; the indicators being: Previous knowledge, memory, awakens their interest.
b) New knowledge: It covers what is learned, based on the analysis of information and critical thinking; the indicators being: Discusses paradigms and beliefs, provides answers, reasons and reflects.
c) Relationship between the previous and the new knowledge: It implies the critical analysis of the various problematic situations; the indicators being: Solve problems, critical thinking, creativity.

METHODS

It is specified that the type of research was applied, where the design is non-experimental, explanatory in scope, data were collected by cross-section, the quantitative approach was used; the determination of the sample involved the following data: Population of 120 students (N), sampling error of 5% (e), confidence of 95% (Z = 1.96) and probability of 50% (P); was replaced in the finite populations formula, a value of 92 was found, considering as an inclusion criterion, that they are students of regular attendance at the Public Higher Education Institution of Peru, selected for the research.

The technique used was the survey, where the instrument was the questionnaire, which are a group of structured questions to be applied in a sample, which contribute to achieving the objectives of the research (Hernández *et al.,* 2014); which were validated by three experts, whose average scores conclude that the construct is adequate, reliability was also analyzed. using Cronbach's Alpha, for which a Pilot Test of 15 students was used, achieving values of 0.939 for the variable "Digital Competencies" and 0.907 for the variable "Significant Learning", therefore, the instruments are very suitable for use in fieldwork (George & Mallery, 2003).

The following table shows the operationalization of the variables, from which:

Table 1

Operationalizing the variables

Variable	Definition	Dimension	Indicator
Independent variable: Digital skills	It is a set of knowledge, skills, and behaviors that allow the individual to efficiently apply various technological resources to obtain information that contributes to the transformation of knowledge (Gutiérrez, 2014).	- Technological competence. - Informational competence. - Pedagogical competence	- Explain features, install software, edit documents, update experiences. - Search, analyze, organize, and select information. - It favors learning, uses strategies, designs, uses ICTs, and uses tools.
Dependent variable: Meaningful Learning	It is a process that is based on the interactions that contribute to the restructuring of cognitive schemes, where previous knowledge is explained by the student according to their diverse experiences, and they are impacted by new materials that promote the construction of knowledge (Moreira, 2018).	- Previous experiences. - New knowledge. - Relationship between the previous and the new knowledge.	- Previous knowledge, memory, awakens their interest. - Discusses paradigms and beliefs, provides answers, reasons and reflects. - Problem solving, critical thinking, creativity.

Note. Own

The questionnaires have five response options, and the Likert scale was used for their analysis, with the following values: "Never" (value = 1), "Almost never" (value = 2), "Sometimes" (value = 3), "Almost always" (value = 4) and "Always" (value = 5); For the analysis of the dimensions and variables, since the student's perception was used to respond to the questionnaires, the answers were grouped into levels, whose width of the intervals was similar, being the levels: Inadequate, Fair and Adequate; finally, it is specified that the SPSS version 27 software was used for the analysis of the results.

RESULTS

The results of Table 3 refer to the variable "Digital Competencies", of which 78.3% of students perceive the digital competencies that characterize their teachers as having a regular level, 17.4% as having an adequate level and 4.3% as having an inadequate level; therefore, most consider that their teachers should continue to strengthen their digital competencies to provide a better educational service.

Table 2

Results of the variable – "Digital Skills"

Level	Frequency	Percentage
Inadequate	4	4,3
Regular	72	78,3
Adequate	16	17,4
Total	92	100,0

Note. Questionnaire "Digital Skills"

Table 3 presents the summary of the behavior of the dimensions of the variable "Digital Competencies", of which the most highlighted by students is "Informational Competence", and what should be reinforced is "Technological Competence".

Table 3

Results of the variable – "Digital skills" (by dimension)

Dimension		Frequency	Percentage
Technological competence	Inadequate	9	9,8
	Regular	57	62,0
	Adequate	26	28,2
Informational competence	Inadequate	4	4,3
	Regular	54	58,7
	Adequate	34	37,0
Pedagogical competence	Inadequate	6	6,5
	Regular	61	66,3
	Adequate	25	27,2

Note. Questionnaire "Digital Skills"

The results of Table 4 refer to the variable "Significant learning", of which 64.1% of the students consider their learning to be at a regular level, 33.7% at an adequate level and 2.2% at an inadequate level; therefore, most specify that as they advanced in the career, they have managed to assimilate different knowledge, which they are currently applying.

Table 4

Variable Outcomes – "Meaningful Learning"

Level	Frequency	Percentage
Inadequate	2	2,2
Regular	59	64,1
Adequate	31	33,7
Total	92	100,0

Note. Questionnaire "Significant learning"

Table 5 presents the summary of the behavior of the dimensions of the variable "Significant learning", of which the most highlighted by students is the "Relationship between the previous and the new knowledge", and what should be reinforced is the "Previous experiences".

Table 5

Variable Outcomes – "Meaningful Learning" (by Dimension)

Dimension		Frequency	Percentage
Previous experiences	Inadequate	2	2,2
	Regular	65	70,6
	Adequate	25	27,2
New insights	Inadequate	2	2,2
	Regular	49	53,2
	Adequate	41	44,6
Relationship between the previous and the new knowledge	Inadequate	2	2,2
	Regular	47	51,1
	Adequate	43	46,7

Note. Questionnaire "Significant learning"

For the analysis of the first specific objective, referring to the fact that the technological competence of the teacher influences significant learning in a Public Higher Education Institution in Peru, an ordinal logistic regression was applied; from where:

H0: There is no influence.
H1: There is influence.

The results are shown in Table 6, where a chi-square value = 11.421 (p = 0.003) was obtained, since the "p" value is less than 5% of significance, it is concluded that there is a significant influence of the teacher's technological competence on significant learning; this is complemented by Nagelkerke's R2 = 0.152, which implies that in 15.2% the changes in the level of significant learning they are generated by changes in the level of technological competence of the teacher.

Table 6

Analyzing the first specific objective

Model Fit

Model	Log. of Verosim.-2	Chi-square	Gl	"P"
Intersec only.	30,860			
Final	19,440	11,421	2	0,003

Pseudo R2	
Cox and Snell	0,117
Nagelkerke	0,152
Mcfadden	0,084

Note. Field Questionnaires

For the analysis of the second specific objective, referring to the fact that the teacher's informational competence influences significant learning in a Public Higher Education Institution in Peru, we have:

H0: There is no influence.
H1: There is influence.

The results are shown in Table 7, where a chi-square value = 32.651 (p = 0.000) was obtained, since the "p" value is less than 5% of significance, it is concluded that there is a significant influence of the teacher's informational competence on significant learning; this is complemented by Nagelkerke's R2 = 0.388, which implies that in 38.8% the changes in the level of significant learning they are generated by changes in the level of informational competence of the teacher.

Table 7

Analyzing the second specific objective

Model Fit

Model	Log. of Verosim.-2	Chi-square	Gl	"P"
Intersec only.	42,502			
Final	9,852	32,651	2	0,000

Pseudo R2	
Cox and Snell	0,299
Nagelkerke	0,388
Mcfadden	0,242

Note. Field Questionnaires

For the analysis of the third specific objective, referring to the fact that the pedagogical competence of the teacher influences significant learning in a Public Higher Education Institution in Peru, we have:

H0: There is no influence.
H1: There is influence.

The results are shown in Table 8, where a chi-square value = 23.056 (p = 0.000) was obtained, since the "p" value is less than 5% of significance, it is concluded that there is a significant influence of the teacher's pedagogical competence on significant learning; this is complemented by Nagelkerke's R2 = 0.288, which implies that in 28.8% the changes in the level of significant learning they are generated by changes in the level of pedagogical competence of the teacher.

Table 8

Analyzing the third specific objective

Model Fit

Model	Log. of Verosim.-2	Chi-square	Gl	"P"
Intersec only.	46,496			
Final	23,441	23,056	2	0,000

Pseudo R2	
Cox and Snell	0,222
Nagelkerke	0,288
Mcfadden	0,171

Note. Field Questionnaires

For the analysis of the general objective, referring to the fact that the teacher's digital competencies influence significant learning in a Public Higher Education Institution in Peru, we have:

H0: There is no influence.
H1: There is influence.

The results are shown in Table 9, where a chi-square value = 55.944 (p = 0.000) was obtained, given that the "p" value is less than 5% of significance, it is concluded that there is a significant influence of the teacher's digital competencies on significant learning; this is complemented by Nagelkerke's R2 = 0.592, which implies that in 59.2% the changes in the level of Significant learning are generated by changes in the level of digital competencies of the teacher.

Table 9

Analyzing the overall goal

Model Fit

Model	Log. of Verosim.-2	Chi-square	Gl	"P"
Intersec only.	62,230			
Final	6,286	55,944	2	0,000

Pseudo R2	
Cox and Snell	0,456
Nagelkerke	0,592
Mcfadden	0,414

Note. Field Questionnaires

DISCUSSION

The main objective of the research carried out is to determine the influence of the teacher's digital competencies on meaningful learning in a Public Higher Education Institution in Peru; for which a chi-square value = 55.944 (p = 0.000) was obtained, which implies that there is a significant influence of the teacher's digital competencies on significant learning, in addition a Nagelkerke R2 = 0.592 was obtained, which means that in 59.2% the changes in the level of significant learning are due to changes in the level of digital skills of the teacher.

We agree with Salazar & Lescano (2022), who conclude that it is key to train teachers more, especially in aspects related to the use of technology in classes, which allows critical thinking, collaborative learning, others; since 62.0% of students perceive the technological skills that characterize their teachers to be at a regular level, Therefore, more and more technological tools are being used as pedagogical support in their classes.

There is also agreement with Flores (2022), who concludes that there is a direct and high relationship between student motivation and their level of significant learning; since it was found that there is an influence of the teacher's pedagogical competence on significant learning, for which it is necessary to apply strategies to motivate the student to study constantly.

We agree with Cutipa (2022), who concludes that digital competencies are directly and highly related to teachers' performance; since it was found that there is an influence of the teacher's digital competencies on the learning level of their students, and achieving learning is the work of teachers, which allows their performance to be evaluated.

There is agreement with the work of Mendoza (2021), who concludes that most teachers, during the pandemic, have had to forcibly learn the use of digital tools, which reflects the inadequate level of use of ICTs; given that it was found that 78.3% of students they perceive the digital skills that characterize their teachers to be at a regular level, reflecting that it is a priority to continue strengthening digital skills to provide a better educational service.

We agree with Bahamondes and López (2022), who conclude that 44.4% of teachers consider the significant learning generated to be regular; since 64.1% of students consider their significant learning to be of a regular level.

CONCLUSIONS

- There is a significant influence of the teacher's digital competencies on meaningful learning in a Public Higher Education Institution in Peru; given the chi-square value = 55.944 (p = 0.000), and Nagelkerke's R2 = 0.592; in addition, 78.3% of the students perceive the digital competencies of their teachers as a regular level, with the most outstanding dimension being "Informational competence"; and 64.1% consider their learning to be at a regular level, where the most highlighted dimension is the "Relationship between the previous and the new knowledge".
- There is a significant influence of the teacher's technological competence on significant learning in a Public Higher Education Institution in Peru; given the chi-square = 11.421 (p = 0.003) and the R2 Nagelkerke = 0.152; therefore, it is suggested to its directors, to manage with the Local Educational Management Unit - UGEL, the development of courses focused on updating the use of ICT.
- There is a significant influence of the teacher's informational competence on significant learning in a Public Higher Education Institution in Peru; given the chi-square = 32.651 (p = 0.000) and the R2 Nagelkerke = 0.388; therefore, it is suggested to their managers to ask the professors to organize and classify the information of their courses, supported by the use of ICT tools.
- There is a significant influence of the teacher's pedagogical competence on significant learning in a Public Higher Education Institution in Peru; given the chi-square = 23.056 (p = 0.000) and the R2 Nagelkerke =

0.288; therefore, it is suggested to their managers to monitor that teachers encourage their students to apply ICT more to demonstrate their academic progress.

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