INTERACTIVE EXPERIENTIAL MODEL FOR THE DEVELOPMENT OF DIGITAL TEACHING COMPETENCE IN REGULAR BASIC EDUCATION

MODELO INTERACTIVO EXPERIENCIAL PARA EL DESARROLLO DE LA COMPETENCIA DIGITAL DOCENTE EN LA EDUCACIÓN BÁSICA REGULAR

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ABSTRACT

The objective of this study is to characterize the practical experiential learning of the use of digital technologies in teachers for the configuration of an experiential interactive model in the development of digital competence of the Regular Basic Education teacher in Peru. A socio-critical and interpretative paradigm and a qualitative approach that responds to applied scientific research in education were oriented. The techniques were the survey and the interview. It stands out, in a relevant way, the construction of a semantic differential scale as a contribution to the processes of instrumentation of studies related to the topic addressed. The sample consisted of directors and teachers of Educational Institutions belonging to the district. The diagnosis shows limitations of teachers regarding digital skills, since they were not aligned with the advance and exponential development in the management of different technologies that constitute a priority after the repercussions generated by the Covid-19 pandemic. In this way, the proposed pedagogical model was carried out based on the theoretical construction method and the contributions of the Holistic-Configurational theory. This allowed us to reach the active, constructive and creative transformation of the experiential interactive model for the development of the digital competence of the E-Learning teacher.

Keywords: digital teaching competence, E-Learning teacher and experiential interactive model.

RESUMEN

El objetivo de este estudio es la configuración de un modelo interactivo experiencial para el desarrollo de la competencia digital del docente de Educación Básica Regular. Se orientó un paradigma socio crítico e interpretativo y un enfoque cualitativo que responde a una investigación científica aplicada educacional. Las técnicas realizadas fueron la encuesta y la entrevista. Se destaca de manera relevante, la construcción de una escala de diferencial semántico como aporte a los procesos de instrumentación de estudios relacionados con la temática abordada. La muestra estuvo conformada por directores y docentes de Instituciones Educativas pertenecientes al distrito. En el diagnostico se evidenció limitaciones de los docentes respecto a las competencias digitales, ya que no estaban alineados con el avance y el desarrollo exponencial en el manejo de las diferentes tecnologías que, serían una prioridad tras las repercusiones generadas por la pandemia de la Covid-19. De esta manera el modelo pedagógico propuesto fue realizado a partir del método de construcción teórica y los aportes de la teoría Holística Configuracional. Ello permitió llegar a la transformación activa, constructiva y creadora del modelo interactivo experiencial para el desarrollo de la competencia digital del docente E-Learning.

Palabras clave: competencia digital, docente e-learning y modelo interactivo experiencial.

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INTRODUCTION

At present, the development of the new Technology of Information and Communication (ICTs), has produced great impacts on the human beings and in every sector of life. The emergence of innovative channels of communication and technology has caused a revolution that change and improve new forms of human relations and contacts, and in terms of work, too. Hence, the influence and effect of the new technology plays a great role in education.

The great advances of technology is a determining factor in the everyday teacher´s practice, particularly today, when Covid-19emerged and imposed a change of impact to the whole world. Teachers were obliged to implement new methods that were not traditionally used, and new digital skills are demanded. For this reason teachers need to develop digital competences to be applied in the teaching-learning process.

The Common Framework of Teaching Digital Competence (Intef, 2017), constitute a reference to the diagnostic and improvement of digital competence by the teachers. Specifically for this research five areas of digital competence have been taken into consideration: informatization and informational literacy, communication and collaboration, creation of digital content, safety and problem solving. Teacher´s competence and digital advance is a key and demanding factor to advise and get meaningful learning on the students.

Consequently, teachers from the Regular Basic Education must be permanently up-dated with active, creative and new methodologies that make students acquire the tools they really need. The initial training of teachers from the Regular Basic Education is an essential stage in the process of educative activities. Nevertheless, the teachers do not manage digital tools sufficiently. It makes difficult the digital learning of native students (Prensky, 2012); another difficulty is the students´ access to digital tools and its practical and motivating application by them, particularly at present when hybrid education is a fundamental challenge for educative actors (Deroncele, 2022).

Educational systems must be improved and the professional training of teachers must be better permanently (Unesco, 2019). The National Educational Project (2021), emphasizes that professionals from the educational sector must be highly competent and competitive with a continuous and permanent education according to the development of science and technology. Colomer et al. (2018), stated that in the last years the educational sector has suffered a very rapid transformation because of the advances and influence of the new technology. So, the initial training and the professional development of teachers are very demanded and significant in order to be competent and competitive, and the technology is an essential point.

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In Peru, after Covid-19, the urgent need for training and training of courses, workshops and programs in the development and implementation of digital technology for the teaching process by teachers is evident (Molina et al., 2019), which determines that future teachers must use them regularly and pertinently when developing their classes and promoting policies that accelerate their access and frequency (Flores et al., 2020).

Studies that have examined the digital competence of teachers in this area still show limitations in terms of the level of knowledge and mastery of strategies (Guizado et al., 2019), to integrate ICT in the teaching-learning process (Nenko et al., 2020), as well as the value of digital skills to strengthen these shortcomings (Orozco et al., 2020), and other research analyzes the sociodemographic variables associated with digital skills in teachers (Moreno et al., 2019 and Sandia et al., 2019). However there are still few proposals for models that help to enhance these digital skills in Peruvian teachers from territorial and subjective contextualization.

The Common Framework of Teaching Digital Competence (Intef, 2017), constitute a reference to the diagnostic and improvement of digital competence by the teachers. Specifically for this research five areas of digital competence have been taken into consideration: informatization and informational literacy, communication and collaboration, creation of digital content, safety and problem solving. Teacher´s competence and digital advance is a key and demanding factor to advise and get meaningful learning on the students. These categories direct and guide the entire process to develop the interactive model and its contextualization in these education professionals.

Consequently, teachers from the Regular Basic Education must be permanently up-dated with active, creative and new methodologies that make students acquire the tools they really need. The initial training of teachers from the Regular Basic Education is still an essential stage in the educational process activities. Nevertheless, the teachers do not manage digital tools sufficiently. It makes difficult the digital learning of native students (Prensky, 2012); another difficulty is the students´ access to digital tools and its practical and motivating application by them, particularly at present when hybrid education is a fundamental challenge for educational actors (Deroncele, 2022).

The National Educational Project (2021) emphasizes that professionals from the educational sector must be highly competent and competitive with a continuous and permanent education according to the development of science and technology. Colomer et al. (2018) stated that in the last years the educational sector has suffered a very fast transformation because of the advances and influence of the new technology. So, the initial training and the professional development of teachers are very demanded and significant in order to be competent and competitive, and the management of technology vital.

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Teachers frequently face different technological problems because they do not master computer tools, they perceive in their daily experience that students handle and master technology very well, however, teachers do not have instruction, workshops and training to be able to integrate and master technology (Gallegos and Alonso, 2007).

In Latin America, it is considered relevant and significant to improve the training models of the Regular Basic Education teacher, strengthening the curriculum, training and technological practice (Silva et al., 2019).

The advancement and development of technology constitutes a requirement to change the teacher's profile, which must develop digital skills to improve the teaching process towards students. It should be noted that in Peru, the Ministry of Education conducted a survey in which 15,092 teachers participated, with the aim of obtaining opinions directly from teachers who work in public and private Educational Institutions at the national level and seeking models and strategies to improve the educational sector. It is observed that only 36.7% of Regular Basic Education teachers studied in the different universities and 63.3% in the Higher Institutes. The latent problem that exists in the Educational Sector is evident, they lack initial training.

Teachers must effectively and immediately integrate technological tools in schools, taking into account two groups: (1) technological skills and (2) curricular didactic skills. The first has a computer instrumental character, while the curricular didactic competencies are the training of teachers for the development of ICT (Hernández, 2008). In the process and evaluation of teaching, the technological and didactic curricular competences complement each other, since a teacher must be prepared in both competences to successfully achieve training, promote a reflective dialogue that generates autonomy, self-regulation of the state of their learning and knowing how to live in a virtual environment (Medina y Mollo, 2021; Medina et al., 2022).

The objective of this study is to characterize the experiential practical learning of the use of digital technologies in teachers for the configuration of an experiential interactive model in the development of digital competence of the Regular Basic Education teacher in Perú.

METHODS

In this research, the interpretive and socio-critical paradigm is used because the environment is contextualized and knowledge is built from the problem that has been identified to contribute to the

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solution through an innovative scheme (Authors XXX). Bearing in mind that scientific research is applied to education; the study is developed under the two paradigms in the same social reality.

In addition, the interpretive paradigm is based on the researcher and on the value of understanding among the study subjects. This allows guiding all interpretation and application actions, likewise expressed in qualitative methods according to Cisterna (2007). Likewise, it understands social phenomena in the context of the research and also in the perceptions and meaning that those involved in the research may have (Gonzales et al., 2007).

Regarding the research approach, it is qualitative because it is oriented to the actions of the subjects. The researcher's effort is focused on the description of what is unique and particularities of the subject, in addition to taking into account that reality is dynamic and holistic, where in-depth analysis and techniques are used, emphasizing the observation of the subject (Deroncele, 2022).

The study is an applied educational scientific research. According to Padrón (2006), this type of research constitutes a link between science and society, in addition to focusing on the solution of scientific problems. It allows us to link with what is happening in society to conclude with the construction of models and provide solutions to the problems encountered (Authors XXX).

Two techniques and instruments are designed, the survey with a semantic differential scale where teachers participated and the interview with the question guide, and directors of Private Educational Institutions.

The statistic used to verify internal consistency in this research was Cronbach's Alpha. This analysis was performed with the statistical package SPSS 25 (Statistic Package of Social Sciences), what means statistical package for the social sciences of which there are 25 versions since its creation.

In the reliability analysis of the instruments, it was carried out through Cronbach's Alpha, resulting in the first category of experiential practical learning of 0.950 and, in the second category of digital teaching skills it was 0.956, so it can be concluded that they reached coefficients with values greater than 0.70 can be considered reliable as shown in table 1 and 2.

Table 1. Reliability of the instrument to measure practical experiential learning.

Dimension / Variables	No. Items	Cronbach's Alpha
metacognitive strategies	5	0.872
Significant learning	5	0.886
didactic planning	5	0.897
Experiential hands-on learning	fifteen	0.950

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Note: The reliability of the instrument and according to the dimensions acquired coefficients with values greater than 0.7; therefore, they can be considered as reliable. Source: Authors' Own Elaboration.

Table 2. Reliability of the instrument to measure teacher digital competence.

Dimension/Variables	No. Items	Cronbach's Alpha
Information and information literacy	3	0.846
Communication and collaboration	3	0.892
Digital content creation	3	0.948
Security	3	0.804
Problem resolution	3	0.820
Teacher digital competence	fifteen	0.956

Note: The reliability of the instrument and according to its dimensions achieved coefficients with values higher than 0.7; therefore, they can be considered as reliable. Source: Authors' Own Elaboration.

In the present research, the quantitative and qualitative information has been processed, for which the quantitative data was taken into account through statistical analysis using the SPSS version 25 software. Calculations and statistical analyzes can be carried out to facilitate the organization of the data, perform bars, graphs for better understanding in addition to facilitating decision making to adopt the best strategies in scientific research. At the beginning, the informed consent of the teachers who voluntarily agreed to answer the questions of the questionnaire that was sent through Google Forms was taken into account. The study involved 92 teachers; the estimated time was approximately 20 to 30 minutes. The surveys were then received via the networks and listed in an Excel spreadsheet. To evaluate the reliability, it was carried out with the SPSS version 27 program.

In this study, the modeling method is applied because a methodological strategy is going to be modeled based on experiential practical learning that will serve teachers for the development of digital skills. The modeling method is the process by which students are induced to representation in order to analyze reality, in addition to knowing the characteristics of the object of study (Fiallo et al., 2016).

After the analysis and search for information in the literature, two categories have been established: the tool category consisting of the experiential interactive model based on experiential practical learning (APE) and digital skills (CDD).

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RESULTS AND DISCUSSION

In the interviews, the lack of technological tools so that teachers can be trained is evident; the support in this regard is poor. It should be noted that there is greater support with respect to computer laboratories in some prestigious Private Educational Institutions. In addition, it must be taken into account that, with the advancement and revolution of technology in our country, the regular National Curriculum for Basic Education (NCBE), reinforces so that teachers are reflective, critical, creative, and innovative, and thus can train autonomous individuals to achieve significant learning (Ausubel, 2002).

Teachers must be prepared and get involved in the teaching process of their students knowing the skills, the level of knowledge and the different ways of learning for effective educational achievement (Estrada, 2018). Teachers must self-evaluate and know what level they are at and how much they can provide their students (XXX Authors), in addition to knowing their cognitive and technological progress.

In the quantitative results, the reliability of the measurement instruments was taken into account. The reliability of the instrument to measure practical experiential learning is shown in Table 3, where a coefficient of 0.989 (almost one), is observed for the general instrument and between [0.963 - 0978] for its dimensions.

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Table 3. Reliability of the items and dimensions of the instrument, to measure experiential Practical Learning.

A. practical experiential	items	Corrected homogeneity index			Cronbach 's Alpha
		Items - SubTest	Items - Test	SubTest - Test	
metacognitive strategies	APECM01	0.917	0.912	0.957	0.967
	APECM02	0.879	0.892		
	APECM03	0.884	0.884		
	APECM04	0.919	0.928		
	APECM05	0.928	0.940		
Significant learning	APEAS01	0.906	0.909	0.975	0.978
	APEAS02	0.926	0.939		
	APEAS03	0.935	0.935		
	APEAS04	0.927	0.931		
	APEAS05	0.931	0.940		
	APEAS06	0.948	0.949		
didactic planning	APEPD01	0.923	0.931	0.954	0.963
	APEPD02	0.827	0.838		
	APEPD03	0.943	0.945		
	APEPD04	0.946	0.945		
Total of the instrument					0.989

Source: Authors' Own Elaboration.

What is determined in Table 3 is that the experiential practical learning construct instrument is very reliable, as it has a result very close to unity, for the cognitive and metacognitive strategies construct (0.967), for the meaningful learning construct (0.978), and for the didactic planning construct (0.963). This results in a reliability of 0.989, very close to unity, which favours the performance of Regular Basic Education teachers.

Next, the reliability of the instrument was carried out to measure teacher digital competence as shown in table 4, where a coefficient of 0.942 is observed for the general instrument and between [0.889 - 0.974] for its dimensions. An instrument is reliable if Cronbach's alpha is greater than 0.7; therefore, it can be said that the measurement instrument has acceptable reliability. The corrected homogeneity

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indexes: Items - Subtest, Items - Test, and Subtest - Test are also shown, where coefficients greater than 0.4 are observed, as suggested by Estrada (2018).

Therefore, it can be said that the items are homogeneous within their dimension, of the variable (with the exception of the items of the digital content creation dimension), where difficulties are observed in the teachers, as well as the dimensions (with the exception of the digital content creation dimension), are homogeneous with respect to the variable.

Table 4. Reliability of the items and dimensions of the instrument to measure CDD.

Teacher Digital Competence	items	Corrected homogeneity index			Cronbach 's Alpha
		Items – Subtest	Items – Test	Subtest – Test	
Information and information literacy	CDDIAI01	0.921	0.857	0.844	0.964
	CDDIAI02	0.939	0.841		
	CDDIAI03	0.911	0.876		
Communication and collaboration	CDDCC01	0.936	0.839	0.821	0.974
	CDDCC02	0.959	0.870		
	CDDCC03	0.940	0.856		
Digital content creation	CDDCG01	0.761	0.373	0.357	0.889
	CDDCG02	0.839	0.420		
	CDDCG03	0.755	0.465		
Security	CDDS01	0.873	0.863	0.810	0.953
	CDDS02	0.928	0.817		
	CDDS03	0.902	0.803		
Teacher Digital Competence	items	Corrected homogeneity index			Cronbach 's Alpha
		Items – Subtest	Items – Test	Subtest – Test	
Problem resolution	CDDRP01	0.881	0.454	0.401	0.923
	CDDRP02	0.819	0.510		
	CDDRP03	0.836	0.489		
Total of the instrument					0.942

Source: Authors' Own Elaboration.

What is determined in Table 4 is that the instrument of the construct of teachers' digital skills is reliable because it has a result very close to unity (0.942). Two subcategories should be taken into account,

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such as the creation of digital content due to the result of 0.357 and the resolution of problems of 0.401, due to the statistical results obtained in the table, which gives rise to the existing problems of scientific research, identifies the lack of innovation and creation of digital content and the lack of knowledge of technological tools.

Table 5 shows that the Cognitive Strategies dimension and its questions are well valued, since the average and median of these are higher than the central value of the scale, which is 4.5. Therefore, it can be said that the surveyed teachers present an adequate level of Experiential Practical Learning.

Table 5. Average, median, and confidence interval for the mean of the dimension Cognitive and metacognitive strategies and items.

Items / Dimension	Half	Median lower	95% CI	
			Superior	
APECM01	5.84	6.00	5.46	6.22
APECM02	5.91	6.50	5.51	6.31
APECM03	5.77	6.00	5.38	6.16
APECM04	6.04	7.00	5.65	6.44
APECM05	5.96	7.00	5.56	6.35
APECM	5.90	6.50	5.54	6.27

Note: The mean of the scale is 4.5. Source: Authors' Own Elaboration.

Statistically, teachers present at a general level an adequate standard with respect to the dimension of cognitive and metacognitive strategies. It should be noted that the teachers of the Educational Institutions of Regular Basic Education identify adequate strategies, methodologies and didactics with respect to the teaching-learning process of the students.

Table 6 shows that the didactic planning dimension and its questions are well valued, since the mean and median of these are higher than the central value of the scale, which is 4.5. Therefore, it can be said that teachers present an adequate level of Didactic Planning.

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Table 6. Average, median, and confidence interval for the mean of the didactic planning dimension and items.

Items / Dimension	Half	Median	95% CI	
			lower	lower
APEPD01	5.93	6.00	5.53	6.34
APEPD02	5.38	6.00	5.00	5.77
APEPD03	5.87	7.00	5.45	6.29
APEPD04	5.87	6.00	5.47	6.27
APEPD	5.76	6.50	5.38	6.14

Note: The mean of the scale is 4.5. Source: Authors' Own Elaboration.

Table 7 shows that the Information and Information Literacy dimension and its questions are well valued, since the mean and median of these are higher than the central value of the scale, which are 4.5. Therefore, it can be said that teachers present an adequate level of Information and Information Literacy.

Table 7. Average, median, and confidence interval for the mean of the Information and information literacy dimension and items.

Items / Dimension	Half	Median	95% CI	
			lower	lower
CDDIAI01	5.65	6.00	5.26	6.04
CDDIAI02	5.76	6.00	5.36	6.17
CDDIAI03	6.02	7.00	5.60	6.45
CDDIAI	5.81	6.33	5.42	6.21

Note: The mean of the scale is 4.5. Source: Authors' Own Elaboration.

Table 8. Average, median, and confidence interval for the mean of the communication and collaboration dimension and items.

Items / Dimension	Half	Median	CI 95%	
			lower	lower
CDDCC01	5.78	6.00	5.35	6.21
CDDCC02	5.72	6.00	5.28	6.15
CDDCC03	5.50	6.00	5.09	5.91
CDDCC	5.67	6.33	5.25	6.08

Note: The mean of the scale is 4.5. Source: Authors' Own elaboration.

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Table 9 shows that the digital content creation dimension and its questions are poorly valued, since the mean and median of these are lower than the central value of the scale, which are 4.5. Therefore, it can be said that teachers present the creation of digital content at an inadequate level.

Table 9. Average, median and confidence interval for the mean of the dimension creation of digital content and items.

Items / Dimension	Half	Median	95% CI	
			lower	lower
CDDCG01	3.83	3.00	3.48	4.17
CDDCG02	3.72	3.00	3.38	4.06
CDDCG03	3.82	4.00	3.50	4.13
CDDCG	3.79	3.33	3.49	4.09

Note: The mean of the scale are 4.5. Source: Authors´ Own elaboration.

Teachers present an inadequate level with respect to the dimension of digital content creation. They cannot create digital content, which is why there is evidence of a serious problem in the educational sector and they are not familiar with technology. For this reason they cannot create and edit digital content, or use blogs to generate learning platforms. They do not take advantage of the number of educational and motivating videos for students due to lack of updating, especially in the times of the Covid-19 pandemic, where teachers had to implement work through virtually. Teachers must have the ability to develop students' critical and technological thinking, their reflective, creative, and ethical abilities (Deroncele, 2022).

The problems found regarding the lack of creation of digital content in teachers, significantly impair the learning process of students, which is the reason for which highly qualified and technological teachers are required to promote resources that allow students to learn to apprehend (Deroncele, 2022), providing a didactic, creative and proactive culture for the benefit of educational quality.

It is necessary to include the technology of information and communication (ICT), in the strategies and methodologies of teachers to provide quality education to improve the learning process of students (Solano, Marín and Rocha, 2022).

It is evident through the interview with the directors of the Private Educational Institutions that teachers want to get ready and update themselves to advance in the process of educational activities, but some do not have their personal technological tools with their laptop due to the economic situation, and other teachers work in other sectors such as taxi drivers, restaurants, shops, among others.

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Table 10 shows that the security dimension and its questions are well valued, since the mean and median of these exceed the central value of the scale, which is 4.5. Therefore, it can be said that teachers present an adequate level of security.

Table 10. Average, median, and confidence interval for the mean of the security dimension and items.

Items/Dimension	Half	Median	95% CI	
			lower	lower
CDDS01	5.72	6.50	5.27	6.16
CDDS02	5.64	6.00	5.19	6.09
CDDS03	5.62	6.00	5.19	6.05
CDDS	5.66	6.00	5.24	6.08

Note: The mean of the scale are 4.5. Source: Authors' Own Elaboration.

Table 11 shows that the problem solving dimension and its questions are poorly valued, since the mean and median of these do not exceed the central value of the scale, which is 4.5. Therefore, it can be said that teachers present an inadequate level in problem solving.

Table 11. Mean, median, and confidence interval for the mean of the Problem solving dimension and items.

Items / Dimension	Half	Median	95% CI	
			lower	lower
CDDRP01	3.91	3.00	3.54	4.29
CDDRP02	3.84	3.00	3.50	4.18
CDDRP03	3.82	3.00	3.43	4.20
CDDRP	3.86	3.33	3.52	4.20

Note: The mean of the scale are 4.5. Source: Authors´ Own elaboration.

The problems found in the research show the lack of use of technology to solve conceptual problems of their specialty and technical problems related to devices, tools and digital environments. Teachers cannot make decisions to choose a digital tool for permanent activities because they are not familiar with technology and cannot have updated information about new studies or scientific progress.

It is necessary for teachers to develop critical and reflective thinking from their initial training to be prepared and face the problems of society by giving innovative solutions (Deroncele, 2022), especially nowadays where technology advances so fast. The development of teachers' digital skills is a problem that goes beyond the educational sector, since the progress of students depends to some extent on

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teachers. For this reason new innovative models are needed, with active methodological strategies and technologies to achieve significant learning in the teaching process.

The distribution of frequencies of the dimensions of experiential practical learning is shown in Table 12, where it is observed that cognitive and metacognitive strategies, meaningful learning, and didactic planning that teachers possess, are found in greater predominance at a high level, followed by a medium or normal level, and finally by a low level.

Table 12. Distribution of frequencies according to levels of the dimensions of experiential practical learning.

Learning Dimensions experiential practice	levels						Total	
	Low		Normal		High			
	No.	%	No.	%	No.	%	No.	%
Strategies Cognitive metacognitive	8	8.70	24	26.09	60	65.22	92	100
Significant learning	7	7.61	18	19.57	67	72.83	92	100
Didactic planning	11	11.96	23	25.00	58	63.04	92	100

Source: Authors' Own Elaboration.

The frequency distribution of the experiential practical learning construct is found in a higher percentage at a high level, in cognitive and metacognitive strategies statistics prevail in 65.22 %, in significant learning in 72.83 % and in didactic planning in 63.04 %. These results determine that teachers handle the strategies well with respect to academic methodologies and didactics for the achievement of learning in our students.

On the other hand, the frequency distribution of the dimensions of teacher digital competence is shown in Table 13, where it can be seen that the dimensions of information and information literacy, communication and collaboration, and safety in teachers are found in greater predominance at a high level, followed by a medium or normal level, and finally a low level as shown by statistics. However in the dimensions of digital content creation and problem solving, teachers predominated in a low level, followed by a medium level and finally a high level.

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Table 13. Distribution of frequencies according to levels of the dimensions of the Teacher Digital Competence

Competition Dimensions digital teacher	levels						Total	
	Low		Normal		High			
	No.	%	No.	%	No.	%	No.	%
Information and information literacy	11	11.96	27	29.35	54	58.70	92	100
Communication and collaboration	15	16.30	25	27.17	52	56.52	92	100
Digital content creation	55	59.78	25	27.17	12	13.04	92	100
Security	17	18.48	26	28.26	49	53.26	92	100
Problem resolution	54	58.70	21	22.83	17	18.48	92	100

Source: Authors´ Own elaboration.

Experiential practical learning (EPL), is directly related to teacher digital competence (TDC), with a Spearman 's Rho coefficient = 0.853, with the dimensions Information and Information Literacy (IIL), Communication and Collaboration (CC), and Security (S), the correlations are between [0.854 to 0.909]. However, with the problem solving (PS) dimension, it obtains a coefficient of 0.298, while with the dimension Creation of Digital Content (CDC) the correlation does not turn out to be significant.

Similar behavior is observed when relating the dimension Cognitive and metacognitive strategies (CM), with the CDC and its dimensions as well as, when relating the dimensions meaningful learning (ML) and didactic planning (PD), with the CDC and its dimensions, with the difference that in the CG dimensions the correlation is significant.

The study coincides with the research by Cabero et al. (2020), where he argues that teachers must be prepared and updated as indicated by the digital competence frameworks, according to the frameworks they are consolidated proposals that serve for the good performance of the professional activities of the teacher. As well Lázaro et al. (2019), agree on the safe and responsible use of technology to develop student learning, therefore teachers must be able to train citizens who use technology, be prepared and updated with new technological and methodological strategies.

The study coincides with the support of Tourón et al. (2020), where they indicate that CDC have become an essential aspect of great interest and trajectory in the initial training of teachers who must promote deep and safe learning in students. In addition, the validation of the instrument made it possible

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to assess the CDC where quality is tested, obtaining high reliability ratings. The results coincide with the study regarding the importance of the development of teachers' digital skills.

Along the same perspectives, Deroncele et al. (2021) argue that institutional conditions are essential to promote educational innovation with technology. Similarly, there are critical factors such as training and permanent updating of technology and the implementation and equipment with internet access. These aspects generate the need for a new model that increases the quality of the teaching process in the current situation.

Proposal of the Experiential Interactive Model for the Development of Digital Teacher Competence in Regular Basic Education.

In the conceptual phase, the theoretical framework of the research and referential literature has been taken into account. In this phase a very strong foundation has been built anchored in the existing theory where two theories have been determined, the conceptual theory and the substantive theory of the research (1) the conceptual phase, (2) the projective phase, (3) the transformative phase, and (4) the phase of epistemic transcendence (Deroncele , 2022), as well as the functional graphic diagram of the research proposal.

Conceptual phase of the research

In the conceptual phase, the theoretical framework of the research and referential literature has been taken into account. In this phase a very strong foundation has been built anchored in the existing theory where two theories have been determined, the conceptual theory and the substantive theory of the research. These concepts are the foundation of the model (Deroncele, 2022), as can be seen in figure 1.

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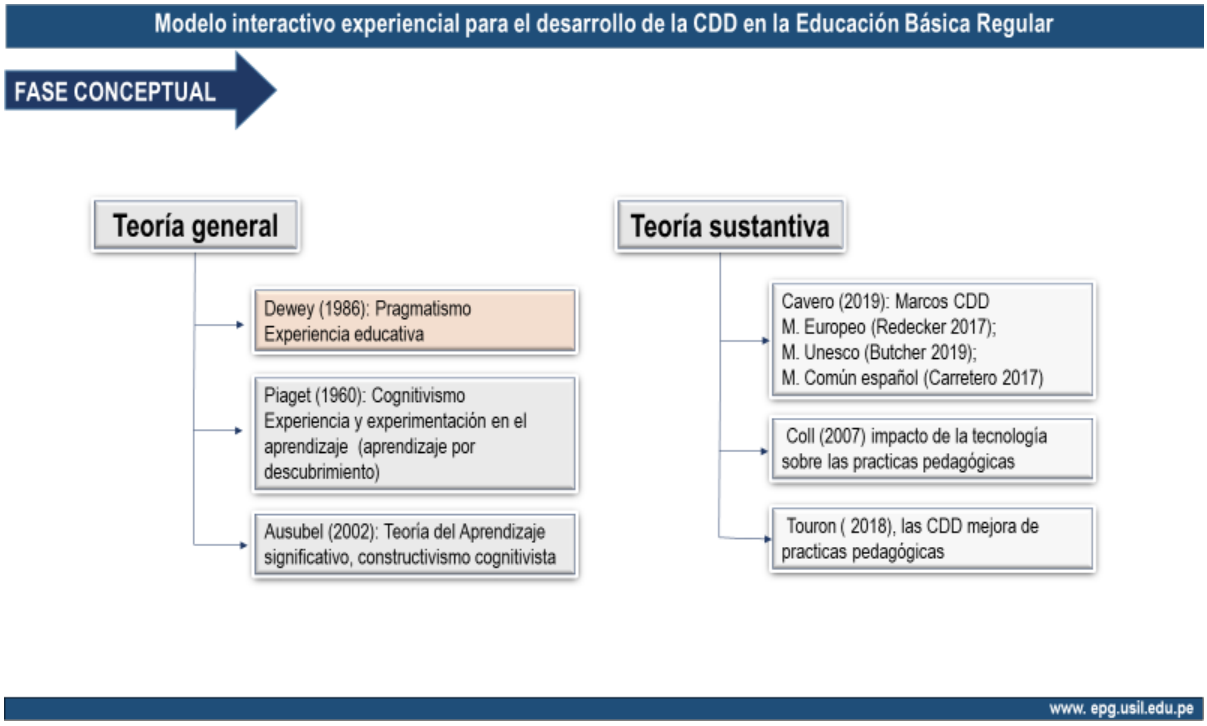

Figure 1. Conceptual phase where the general and substantive theory of the theoretical model are identified. Source: Authors´ Own Elaboration. (Spanish Elaboration).

In figure 1, the general theory is observed first. The philosophical current is based on Dewey (1967), where he argues that the main concept related to the theory of knowledge is experience and experience with knowledge reinforces each other. The Human beings learn through practice and error. In the experiential learning model the construction of knowledge from experience is shown and it consists of a cyclical process where the four phases are interconnected: experience, observation, conceptualization and experimentation.

These phases are directly related to the study since teachers are in permanent and constant changes relating to the four phases: acting or experience, reflective observation of the teacher, the cognitive part or conceptualization and applying experimentation to the achievement of the development of digital skills; identifying the practical part, the experience of permanent change and the active, constructive and creative transformation that every teacher must have for the effective achievement of educational activities.

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Projective phase of the investigation

In the projective phase, the methodological route of the model has been built taking into account the hypothetical methodological construction method, where there will be a connection, organization, viability, applicability and clarity that will serve as the basis for the construction of the experiential interactive model for the development of the digital competences of the E-Learning teacher. In this direction the educational reality has been interpreted in a historical context due to the pandemic that is currently caused by COVID-19 and directly affected the educational sector, in a very special way to teachers, to exist a sudden change from face-to-face to virtually and work through technological networks. From the diagnosis, the emerging categories are identified.

Deroncele (2022), and the dialectical holistic method have been taken into account, following the principles of Homero Fuentes' Configurationally Holistic Theory. The proposal involves the systematization of established knowledge where there are general theories and substantive theories that give theoretical and epistemological support to the model. Similarly, the hypothetical deductive reconstruction where the proposal of what is going to be found in the different research theories is shown, where it has been configured to generate a reconstruction of the configurations found. It is where an epistemological gap focused on the diagnosis is evident from two emerging categories that are technological innovation with pedagogical criteria and knowledge of technological tools.

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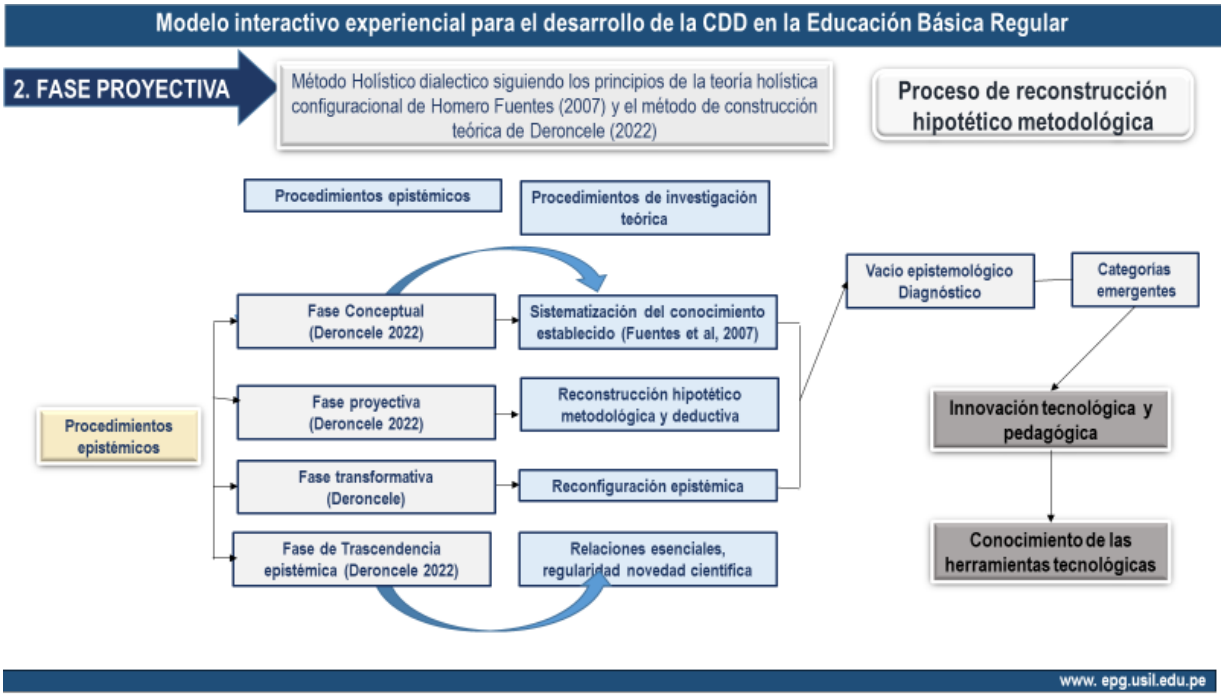

Figure 2. Projective phase of the methodological hypothetical research process. Source: Authors' Own Elaboration. (Spanish Elaboration).

Figure 2 shows the sequence of the projective phase of the methodological hypothetical research process where the epistemological configuration is presented taking meta-reflection into account (Deroncele, 2022). In this phase the systematization of the established knowledge is identified. In the hypothetical methodological reconstruction, the epistemological reconfiguration is presented. In this transformative phase the level of configurations is reached to later achieve the dimensions of the model proposed by the authors of this research (EIMDDTC).

Finally, the essential relationships that constitute the regularity that becomes the scientific new feature are focused on the experiential interactive model for the development of digital skills of the E-Learning teacher.

Transformative phase (proposal of the model-epistemological reconfiguration)

The transformative phase comes to make the epistemic reconfiguration. In this phase the theoretical modeling process with the configurations has been carried out through the Dialectical Holistic Scientific Method (Solano et al., 2020). In this transformative phase, the relationship, organization and emerging product will be taken into account (Deroncele, 2022).

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After a process of theoretical reconstruction that started from the existing educational reality where the emerging categories were found, the configurations have been established to reach the constructive and creative active transformation of the E-learning teacher as designed and implemented. See figure 3.

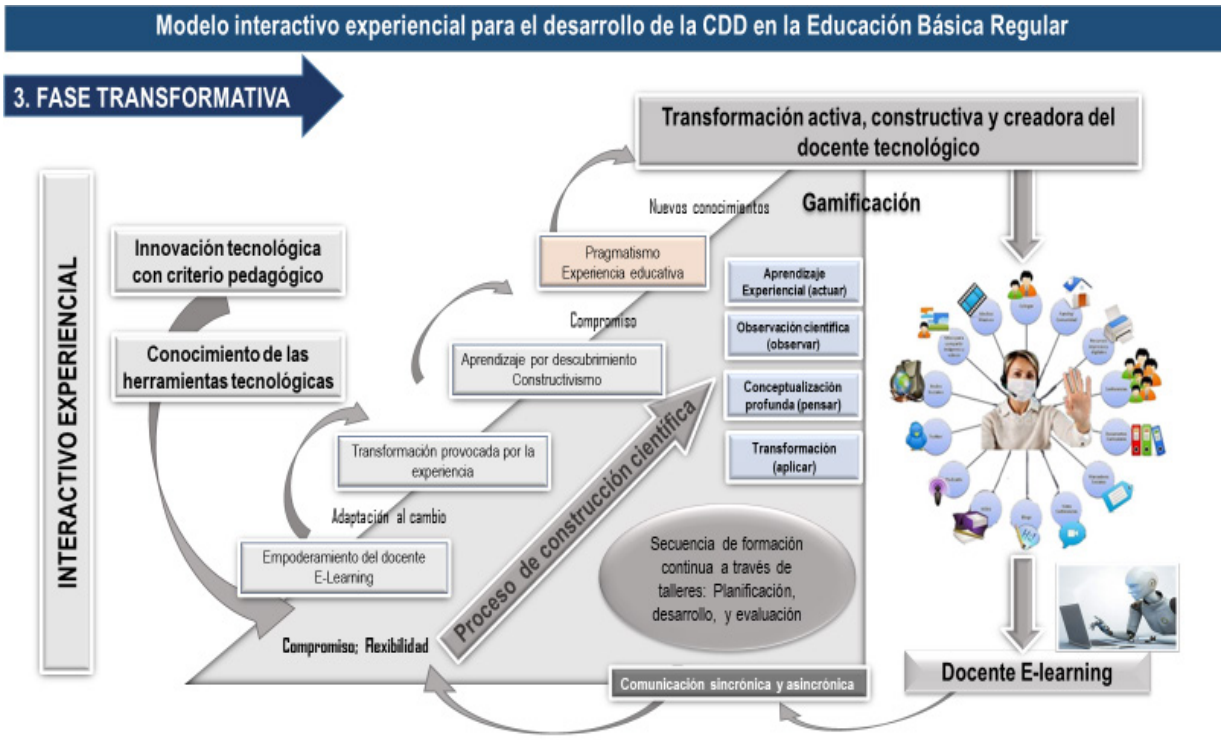

Figure 3. Transformative phase of the experiential interactive model for the development of teachers' digital skills (CDC). Source: Authors´ Own elaboration. (Spanish Elaboration).

Following the Holistic Dialectical Method, at first, the phases of pragmatism or educational experience have been related to learning by discovery with the theory of significant learning where the teacher will build learning through practice. The teacher will adopt new changes, having a firm commitment, empowering himself with the new knowledge to reach the active, constructive and creative transformation of the technological teacher. He will take into account the experience, permanent practice and reflective observation to conceptualize and apply the new concepts, knowledge that helps the development of digital competences. There must be a commitment to conscious change and adaptation to reach the solution of the problem through a sequence of continuous training through workshops where there is planning, the development of activities and permanent evaluation. This model will be carried out through synchronous and asynchronous networks due to the situation experienced by COVID-19.

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Phase of epistemic transcendence.

In the phase of epistemic transcendence, the essential relationships are presented, such as the integrating relationship of the elements and the scientific novelty focused on the experiential interactive model for the development of digital skills of E-Learning teachers. It must be taken into account that the scientific novelty is the most important phase in this research due to its originality since a meta-reflection of the theoretical contribution is evidenced.

In this phase of very deep and reflective analysis where the units of synthesis are systemically related, where the three phases will be taken into account, the essential relationships (abstraction), regularity (generalization) and scientific novelty (epistemic transcendence) constitute crucial facts taking into account the theoretical model of Deroncele (2022).

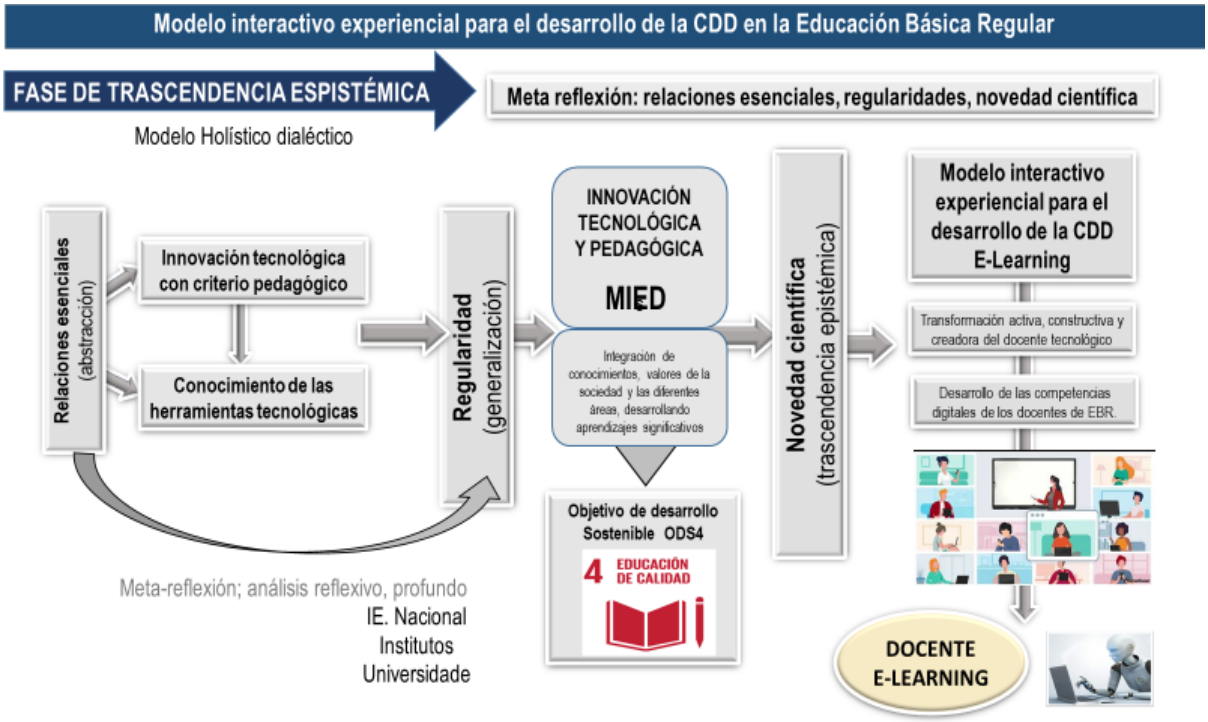

Figure 4. Phase of epistemic transcendence: essential relationships, regularity and scientific novelty. Source: Authors´ Own Elaboration (Spanish Elaboration).

The *Experiential Interactive Model for the Development of Digital Teacher Competence in Regular Basic Education* presents originality created after a thorough diagnosis through the application of the instruments, the validation of experts, the epistemological bases, among others. In addition, it is regular because it is applicable to other institutions such as state educational institutions, pedagogical institutes,

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universities, entities such as the Ministry of Education of Culture, and others. As well, the model proposed is authentic, created by researchers who are involved in the educational sector, and it is a scientific novelty because it is distinctive and original in the educational sector, as shown in Figure 4.

CONCLUSIONS

The lack of knowledge of the efficient use of technological tools to solve technical problems and identify technological needs is evident. There is a dependency regarding the management of technology that can put confidential information at risk. Teachers have not developed their digital skills sufficiently and are aware of that they are not confident in the management of technological tools.

Educators recognize that they are not prepared in the technological part and those new strategic educational models, training and updates are necessary to achieve the institutional objectives. In this way, the need arises to apply new methodological strategies for the development of digital skills of Regular Basic Education teachers. Above all, at present where teachers are developing pedagogical activities through technological networks due to the COVID-19 pandemic.

The experiential interactive model designed reveals the potential development of digital skills of E-learning teachers. Regulation documents have been enacted taking into account the context in which the study is developed and is integrated with the theoretical contribution of established knowledge.

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