



ORIGINAL ARTICLE

Learning Assessment. A century of distance education in México

Evaluación del aprendizaje. Un siglo de educación a distancia en México

Avaliação de Aprendizagem. Um século de educação a distância no México

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KEYWORDS

distance education,
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ABSTRACT. This research article rescues the origin and evolution of the learning evaluation process in distance education programs that have been offered in the Mexican educational system for a century. First, the historical and current context of evaluating distance education in Mexico is addressed. The method for the analysis of the information corresponds to the cycle of hermeneutic interpretation that allows triggering historical-social elements to discuss the findings found. The results are presented in the following sections: a) educational programs offered at a distance, b) elements of the formal curriculum and pedagogical approaches and c) principles of evaluation-feedback-digital technologies used in times of the covid-19 pandemic. Finally, it concludes with a reflection on the controversies in evaluating learning in the evaluation process in times of the covid-19 pandemic.

PALABRAS CLAVE

educación a distancia,
evaluación, covid-19,
tecnologías.

RESUMEN. En este artículo de investigación se rescata el origen y la evolución del proceso de evaluación del aprendizaje en programas de educación a distancia que desde hace un siglo se han ofertados en el sistema educativo mexicano. Se aborda el contexto histórico y actual de la evaluación en educación a distancia en México, el método para el análisis de la información corresponde al ciclo de interpretación hermenéutica que permite detonar elementos histórico-sociales para discutir sobre los hallazgos encontrados. Se presentan los resultados en los siguientes apartados: a) programas educativos ofertados a distancia, b) elementos del curriculum formal y enfoques pedagógicos, y c) principios de la evaluación-retroalimentación-tecnologías digitales utilizadas en tiempo de pandemia covid-19. Finalmente se concluye con la reflexión sobre las controversias en la evaluación del aprendizaje en el proceso de evaluación en tiempo de pandemia covid-19.

PALAVRAS-CHAVE

RESUMO. Este artigo de pesquisa resgata a origem e evolução do processo de avaliação da aprendizagem em programas de educação a distância que são oferecidos no sistema educacional mexicano há um século. Aborda-se o contexto histórico e atual da avaliação em educação a

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distância no México, o método para a análise da informação corresponde ao ciclo de interpretação hermenêutica que permite desencadear elementos histórico-sociais para discutir os achados encontrados. Os resultados são apresentados nas seguintes seções: a) programas educacionais oferecidos a distância, b) elementos do currículo formal e abordagens pedagógicas, ec) princípios de avaliação-feedback-tecnologias digitais utilizadas em tempos de pandemia de covid-19. Por fim, conclui com uma reflexão sobre as controvérsias na avaliação da aprendizagem no processo avaliativo em tempos de pandemia de covid-19.

1. INTRODUCTION

His article is considered pertinent in evaluating distance learning implemented during the health emergency as a result of the COVID-19 pandemic. This socio-historical event shows existing pedagogical problems in Mexican education (Escudero-Nahón, 2021). The improvisation and uncertainty among teachers about the strategies to teach and evaluate distance learning in an emergency and unprecedented context during the total confinement, the 100% distance teaching and learning experiences, were very diverse, some of them tremendously traumatic, others not so much, and in others, they could affirm that they enjoyed and gained opportunities to improve the distance learning process (García, 2021). In the same context of analysis, there are results of educational research carried out that show the opinion of teachers who accept the need to increase their skills to improve pedagogical support, the management of digital technologies to teach the class at a distance given that the pandemic covid-19 has changed the educational process (Sánchez et al., 2020). The training of teachers to innovate their style with the support of technologies has not been a resolved project; for several decades, educational programs have been implemented in the distance mode to increase the offer of courses that enable the development of knowledge. among the teaching population, however, there are still high percentages of teachers who do not accept incorporating technologies into their classes (Ramírez & Casillas, 2014).

This research starts with the definition of digital distance education, proposed by García (2021, p. 14):

Digital distance education encompasses a non-face-to-face education model fully supported by digital systems. So, one would be talking about virtual education, teaching, online learning, supported by technologies, on the network, on the Internet, on the web, e-learning, distributed learning... it tends towards openness, towards non-dependence on physical location, to the flexibility of time, space and pace of knowledge, to active learning, to synchronous and asynchronous interaction.

It is still necessary for teachers and students to reflect on the problem in the process of evaluating learning in distance education; the arguments proposed by: Sánchez et al., (2020); Sánchez and Martínez (2020) on changing the evaluation to a moment to reflect, assess and provide feedback on the student's performance that allows him to develop skills for self-learning.

The objectives of this research were: 1) to build a historical and current view of the distance learning evaluation experiences in Mexico, and 2) to know the technologies to evaluate distance learning in times of the covid-19 pandemic, therefore, analyzing the present reality and understanding as much as possible the historical reality that remains in continuous movement, allows making relevant proposals in the current context Zemelman (1987), the central approach that guides the development of the research was that he affirms: What are the background to the current situation of the evaluation of distance learning in the context of the covid-19 pandemic?. From the same historical (interpretive) perspective, the following empirical premise is integrated into this research: a)

interaction through dialogue between teacher and student favors the learning evaluation process with the use of digital technologies every time; once the methodological approach has been proposed, this research is justified, given that, given the implementation of distance education due to the covid-19 emergency, there is still a need to rethink and propose relevant learning content in the formal curriculum to innovate teaching and learning. The development of didactic, pedagogical, and technological skills allows the teacher to teach classes 100% in the distance modality Bosco and Barrón (2008); Moreno (2015); Quesada (2006). Among the results found, findings support the new ways of didactic interaction present in the evaluation process in distance education that empower the student to achieve better personal and academic results.

2. METHOD AND MATERIALS

To develop this research, a cycle of hermeneutic analysis proposed by Londoño et al. (2014) argues that the hermeneutic method in documentary-interpretive analysis facilitates the apprehension of the meaning of the concepts surrounding the object of study while new concepts are built around the problem studied. Doing a hermeneutic analysis truthfully provides the concepts, arguments, and dissertations that other researchers have already found through a scientific research process; ideas are encouraged that support the interpretation of events with a qualitative approach since it aims to describe a concrete reality through the historical analysis of the experiences and precedent circumstances in the evaluation of distance learning in Mexican educational programs.

The cycle of hermetic analysis was integrated with the following stages: a) explain the events in the historical context, b) translate the events to a current context, and c) interpret the relationship between the object of study and the empirical premise, then, advance in the understanding of reality, it allowed us to rethink and propose elements of intervention by the teacher to transform educational evaluation.

In short, searches were carried out in databases, such as Google Scholar, EBSCO, and catalogs of indexed journals: Scopus, Scielo, Redalyc, and Dialnet, of which 20 reliable documents were analyzed for their methodological rigor on the subject of distance education. In Mexico. As a particular strategy, general concepts related to the topic of distance evaluation in Mexico were searched for in the thesaurus system of the United Nations Organization for Education, Science and Culture -UNESCO- to identify and analyze the parallel descriptor concepts that serve as a reference to broaden the search results to the extent of scientific publications. This UNESCO Thesaurus system was selected because of the recognized relationship it maintains at a national and global level with educational innovation policies, including distance education. The 20 papers were selected based on compliance with the following criteria: a) bibliography on distance education in Mexico, b) scientific articles on distance education, c) working documents from institutions that provide distance education, and d) temporality. To date, the publication is open.

3. RESULTS

a) Historical and current context of distance education in Mexico

Initially, distance education in Mexico was implemented as an emerging strategy of the State to stabilize the population in a post-revolutionary context in 1923, with an index of more than 80% of the illiterate and peasant population that lived mainly in rural areas. So, it can be argued that distance education programs from their origin until the current time of the covid-19 pandemic are implemented as a strategy to increase the educational offer and continue with the training process in the face of the triggered public health problem. Some historical and current events regarding the implementation of distance education in Mexico are highlighted below. Following (Bosco & Barrón, 2008; Cookson & Domínguez, 2015; T. Moreno, 2021; Sánchez et al., 2020):

- Satisfy educational demand;
- The need to train teachers to attend the literacy brigades;
- Strategy to increase enrollment of literate adults;
- Educational modernization according to neoliberal principles and globalization;
- Increase professional training processes with the support of ICTs;
- Continue with classes due to the closure of schools in times of the covid-19 pandemic.

The events above prove that since its origin and present, distance education has been implemented as strategies to solve short-term problems that impact society; its implementation is consolidated through the systematized work of pedagogy, technological resources, and participating teachers. Distance education in Mexico is a project with solid foundations in its pedagogical approaches and implementation processes. Likewise, the distance education process maintains a trend toward increasing the quality of training (M. Moreno, 2015).

The circumstances in which teachers have faced the problem of the digital gap and social inequality that undoubtedly impacts the learning process are currently unknown. However, issues related to the lack of a computer or telephone with an internet connection, school dropout, absence, lack of attention, and motivation to perform tasks stand out, so it is essential to make students aware of their commitment and responsibility to Their learning. Next, the educational programs implemented in Mexico are presented, emphasizing the period in which they were offered and the characteristics of the learning evaluation process (see table 1).

Table 1.

Historical look at distance learning assessment

Period	Distance Education Programs	Evaluation process
1921-1969	Cultural Missions, 1921	Memoristic declaration and measurement of knowledge as evidence of learning
	Rural Normal Schools, 1923	
	Radio School: Elementary School for Adults, 1941	Measurement based on the delivery of questionnaires that provokes perception of good and bad
	Federal Teacher Training Institute, 1944	
	Trades Technical Training, 1958	
National Center for Industrial Technical Education, 1964		
1970-1999	Open High School, 1971	The test score is the evidence of learning
	Open University System, 1972	
	National Institute of Adult Education, 1981	



	Continuing Education Network, 1995 Technological Institute of Higher Studies of Monterrey, 1996	The application of automated tests (reliable and valid) Results are credited or uncredited
2000-2019	Common Space for Higher Distance Education, 2007 Massive Open Online Courses, 2007 UNAM Distance Baccalaureate, 2007 Coordination of the Open University of Distance Education, 2009 National Distance Education System, 2010 Educational Programs COURSERA, 2011	Assessment methods and techniques with a focus on educational and professional skills Quantitative and qualitative learning evidence The results provoke critical reflection towards improving learning.
2020-2022	Basic Education: Learn at Home I, II and III Higher Secondary and Higher Education: Online or virtual courses, in modality, blended or distance learning	Evaluation in emergency situations with the support of digital technologies (guides with teaching recommendations)

Font. Own elaboration with information Amador (1969); Bosco and Barrón (2008); Campero et al., (2000).

Socio-educational context of the literacy of the population

During the historical period corresponding to the literacy of the population (1921), the educational process was developed with a pedagogical approach based on the principles of the active school theory, proposed by John Dewey in 1918 on relating school content with life (Iturriaga, 2007). The vibrant school suggests teaching methods based on the principle of "learn by doing," for which it was necessary to consider the life circumstances of the indigenous and peasants who, for the most part, did not know how to read or write for their detail, the rural teachers received training at a distance, they learned didactic methods and techniques to teach the contents related to the countryside, agriculture and the environment, to be a teacher it was a sufficient requirement to know how to read and write, as well as to have the willingness to change residence, since, mainly, I would live in the assigned rural community.

The evaluation of the learning consisted of the solution of a questionnaire, which was attached to the final part of the magazine: *El Maestro Rural*; said questionnaire had to be resolved and returned by mail to the Directorate of Cultural Missions in Mexico City. Finally, the teachers presented a final exam in person at the end of the school year. The exam was considered evidence to award the title to the teachers, most of whom did not have a professional designation.

Distance training of rural teachers was eminently the priority of the educational system; however, the evaluation, feedback, and accreditation were carried out in person and in groups during a series of lectures with various topics on teaching work given during the summer vacation period. The technological resources used were the radio that allowed offering massive literacy courses, reaching coverage from Mexico City to the Sierra Tarahumara in Chihuahua and rural areas in Veracruz. On the other hand, educational television and film had less impact on the population due to limited access among the Mexican population (Mejía, 2011).

Socio-educational context educational modernization

During 1970-1999, the period of educational modernization occurred, years in which a more significant number of distance education programs were created to solve problems derived from the socioeconomic context because

the "Mexican miracle" came to an end, a time that refers to promoting industrialization, construction of roads, ports, and connectivity (Gómez, 2020). Furthermore, the country's automation impacted the implementation of new teaching methods with a scientific and humanistic approach; programmatic teaching was included (González, 2008). Also, the first Open Distance University was created in Mexico and in Latin America with a pedagogical approach focused on memorizing content to present for final exams, whose purpose was to allow students who did not enter face-to-face education and solve the problem caused by the concentration of the educational offer in the states of the center of the country (Amador, 1969).

The evaluation of learning focused on qualitative measurement that consisted in the elaboration of a final exam of the course; distance teaching was also supported through the didactic package: workbook and printed textbook, audio and video cassette, radio, TV with satellite system, videoconferences and postal mail. Although no records were found on any feedback process from the teacher to the student, the evaluation of learning is justified with those of the measurement of knowledge.

Context of educational innovation.

Educational innovation emerged during the years 2000–2019, influenced by the principles of political and economic neoliberalism; distance education programs continue to increase and are taught through the media such as radio, television, and also, with educational packages in different printed formats, audio cassettes, video recordings, and multimedia compact discs, memories and the cloud to store information.

Significantly, the participation of the National Association of Universities and Higher Education Institutions (ANUIES) stands out, which promoted the innovation of distance higher education, and transformed the process of curricular planning to communication between the participants. As a result, the open and space higher education model was developed through multidisciplinary networks to establish the pedagogical, technological, and administrative bases embodied in the distance higher education master plan (ANUIES, 2001).

The pedagogical approach was based on the theoretical principles of constructivism, skills, and instructional design of online or virtual learning environments. Learning feedback evolved in an avant-garde way; in most distance programs, academic counseling and tutoring actions were implemented to provide feedback to the student to increase approval and terminal efficiency (Chan-Núñez, 2016). It is appropriate to highlight that the spread of the Internet was the factor that benefited distance education programs since it was available not only in universities but also in homes and even the popular rental of computers with an Internet connection, commerce known as a cybercafé, which reduced prejudices about its use and improved the perception of people with a more favorable attitude towards distance education.

Socio-educational context digital distance education by covid-19

Escudero-Nahón (2021) establishes that the closure of schools is an unprecedented event in the history of education in Mexico, so the education that is taught in times of the covid-19 pandemic, from the sociohistorical context, is considered emergency education. Or remote, but not distance education, since it does not comply with the principles of the formal curriculum to offer distance education as already identified in the distance education experiences in Mexico.

From the reflection of García (2021), teachers and students solve pedagogical and technological problems with their resources; they face conflicts about the different emotional and cognitive maturity levels to develop self-

study skills and carry out the assigned tasks. Therefore, the confidence and validity of the evaluation process must have a solid base in the process of pedagogical dialogue to provide feedback on learning. Dusse (2020) pronounces the advantages of (synchronous) didactic dialogue between teacher and student during the development of the distance class through videoconference through Zoom, Google, and Microsoft, resulting in a strategy that interweaves the feedback process. Individual and group that favors the learning evaluation process.

a) Formal curriculum in distance education programs

Advancing in the historical analysis allows us to recognize that until the year 2019, digital distance education was officially formalized in the General Law of Education, a normative document in the Mexican educational system, which defines it as, education does not school through programs.

Digital technologies mediate distance, online, or virtual education through the digital platform, email, forums, and chats (Diario Oficial de la Federación, 2019). It is appropriate to mention that before this government decree, distance education was supported by the autonomy of universities to provide education; in effect, it is an achievement in favor of the formalization of distance programs with the support of digital technologies (ANUIES, 2001). Furthermore, the elements of the formal curriculum show the internal consistency between the sociohistorical context, pedagogical approach, and distance education model (see table 2).

Table 2.

Bases of the formal curriculum in distance education

Period	1921-1969	1970-1999	2000-2019	2020-2022
Context Socio-educational	Literacy of the population	Educational modernization	Educational innovation	Distance education due to covid-19
Pedagogical Approach	Active school and teaching machines	Educational technology, cognitive theories and constructivism	Educational and professional competencies	Adequacy of the curriculum for the use of the internet and digital technologies
EaD model	Postal correspondence service	Exam preparation by the student	Instructional design	Teaching based on the use of the internet and digital technologies
Modality	Semi-face-to-face, open and by postal correspondence	Blended learning, school attendance and by postal correspondence	Semi-face-to-face, schooled and through multimedia resources on the internet	School program, 100% remote through the internet and digital technologies

Source: Own elaboration (2022), with information from ANUIES (2001); Bosco y Barrón (2008); Cookson y Domínguez (2015); Sánchez et al. (2020)

b) Distance learning evaluation and feedback

Santos (2021) proposes a marked evolution in the evaluation and feedback process of distance learning. He establishes a pedagogical link between the teacher and the student as a permanent interaction, dialogue, and reflection to guide the feedback process as an essential pedagogical component in student learning, represented by teaching actions linked to improving the areas of opportunity detected during the achievement of expected education. Evaluation as learning feedback is strengthened through the following teaching activities proposed by T. Moreno (2021): a) identify areas for improvement in the activity or task; b) new instructions to modify the activity; and c) provide educational resources to guide what needs to be improved. Therefore, rethinking learning feedback practices through teacher-student interaction enables assessment with various techniques and instruments to assess individual and group activities: projects, case solutions, tests, and homework, among others. Delivery of activities and projects.

Technology of the information and communication.

Distance education in Mexico, since its origin, has incorporated the use of Information and Communication Technologies (ICT) based on a cognitive-behavioral pedagogical approach, as well as seeking to improve the educational process; it has been implemented, since audiovisual teaching, programmed teaching to learning environments (online or virtual) that constitute a methodological strategy for didactic interaction and the pedagogical link between teachers and students who are physically separated (Aparici, 2017). Radio programs with educational content aimed at a population interested in studying are the most significant antecedent of incorporating technologies that currently enable distance education Dusse (2020) also allows synchronous and asynchronous dialogue to be established through email, wikis, blogs, forums, chats, videoconferencing, and work on social networks (see table 4).

Table 4

Technology Resources for Distance Learning

Period	1920-1969	1970-1999	2000-2019	2020-2021
Technological resources used	Post mail, radio, educational television, print magazine	Didactic package: exercise book and printed textbook, audio and video cassette, radio, TV with satellite system, videoconferences and postal mail	Internet, digital platform, multimedia on compact discs, Internet, email, radio, open television, learning resource repositories (REA)	Open television, radio and internet: email, written and voice message system, videoconference and social networks

Source: Own elaboration (2022) with information from Cookson and Domínguez (2015); Dussen(2020); Moreno-Valleb(2001); Ramírez y Casillasb(2014)



The Directorate of Educational Evaluation and the Coordination of Curriculum Design and Innovation (CODEIC-UNAM) established a guide to evaluating distance learning in times of the covid-19 pandemic, highlighting the possibility of using technologies to improve the expected learning results in each course, workshop, laboratory, seminar or professional practice (Campero et al., 2000). Digital technologies are a tool for learning that allows individual or group meetings; they offer the possibility to record the session. It was identified that there is accelerated participation of the students in the search and management of the information available on the Internet; however, difficulties are placed in maintaining attention and commitment in the development of a task, despite the interaction in Live through videoconferencing applications and social networks, students persist with the feeling of loneliness, anxiety for not fully understanding what is requested in the task. Even in the current context caused by the COVID-19 pandemic, the digital distance education project can be a pedagogical experience that sheds light on the strengthening of distance education that is ad hoc to the demands of the current educational context. Next, the most used digital technologies in distance education in times of pandemics are presented (see table 5).

Table 5

Digital Technologies to evaluate learning in times of the covid-19 pandemic

Digital technology	Definition	What can be evaluated
Rubric Start	Application for the design of evaluation rubrics	Evaluation criteria and level of performance
Adobe Acrobat, PDF. Word, Excel, Power Point	Text file processor in office programs	Academic works: analysis, synthesis, summary, review, case projects and essay
Blogger, podcast, and Linked In	Dissemination of information	Development of knowledge dissemination projects
Google Scholar and Wikipedia	Information databases	Search and analysis of information and control of readings
Dropbox and OneDrive	Cloud to store information	Tools to process information
Moodle, Blackboard, Google Classroom y Microsoft Teams	Platform to manage learning	Different learning environments and integration of the points or grades achieved by the student.
Facebook, Twitter, WhatsApp YouTube Instagram, Pinterest	Social network and synchronous meetings with video conference	Oral presentations, work journal, notebook, portfolio and graphic organizers
Mozilla, Firefox, Google Chrome.	Navegador en internet	Internet browser
Gmail y Outlook	Email with asynchronous tools	Synchronous and asynchronous work
Google Docs y Drive	Cloud to store information	Personal database with compiled information.

Google Forms	Application to conduct surveys	Open and objective tests or exams. Examination results achieved
Google Meet, Skype y Zoom.	Application to develop video conference.	Synchronous meetings, text or video projection, cases, problems and projects to be developed.

Source: Own elaboration (2022) with information from Campero et al. (2000); García (2021); Sánchez et al. (2020)

4. DISCUSSIONS

Some problems correspond to the process of evaluation of learning caused by the controversies in the quality of distance education, students and graduates maintain opinions about the disagreement and bad experience in the evaluation process, feedback and grades achieved, teachers also add to the list of observations and complaints about the student's participation in the learning evaluation process. However, according to Gimeno (1920) evaluation practices should not create anguish or discourage the student from frustration; instead, they promote learning through critical dialogue to identify and improve the errors, confusion, and conflicts generated. Between the evaluation process, from historical time to today in the time of the covid-19 pandemic, controversial arguments about remote evaluation are presented below:

- a) The training of the distance teacher has been biased; it has focused on the management of technologies, which is not enough. Therefore, the methodological rigor that guarantees the objectivity, reliability, and validity of the results is considered of lower quality obtained in the evaluation (Quesada, 2006)
- b) The results of the evaluation may lack reliability and validity, given the vast possibility of committing academic plagiarism that consists of copying, pasting information without bibliographic references and presenting it as an own activity (Dorrego, 2016);
- c) The evaluation process is quantitative; it focuses on the measurement and sum of results; no formative evaluation guides the student towards the continuous improvement of their learning (Moreno-Valle, 2001).
- e) The formative evaluation is developed through self-assessment and self-diagnosis exercises with an intuitive format; they do not meet the purpose of feedback from the teacher (García, 2020).
- f) The feedback during the evaluation process should support the student in developing and reinforcing their skills, leading to self-reflection and participation in collaborative learning (Taype, 2021).

In the formative evaluation, the teacher is expected to guide the student to question what they already know and motivate them by generating new questions and seeking answers linked to their daily life (emotions, ideas, beliefs, social context, etc.) and the new knowledge that is offered. It is necessary to emphasize that, despite the notable evolution of distance education programs, there are constant questions and assertions about the authenticity, reliability, and integrity of the learning results in these programs, often with exaggerated and unfounded opinions that support is controversial, not only educational quality but the same educational process and the results achieved.

5. CONCLUSIONS

In this research work, we reflected on the learning evaluation process in distance education from a historical and current context; the most representative educational programs were analyzed, learning evaluation experiences were found for 100 years, and the evolution is recognized of the pedagogical elements that favor the pedagogical link between the teacher and the student through digital technologies. The multiple options available on the internet to make use of digital technologies that facilitate the evaluation of learning and the possibility of engaging in a pedagogical dialogue that guides the student to achieve autonomy and improve their learning process is relevant, are the activities carried out by the student consciously to learn, employs study skills, and recognizes the cognitive skills needed to complete a task.

These last arguments declare that the history of distance evaluation in Mexico is valuable; the review of experiences explains certain aspects of the educational past that are currently determining the present reality. In this research, it was possible to appreciate the importance given to the functions of learning evaluation as a measurement of rote learning through the results of standardized tests and exams that referred to focusing on the student's functional performance as responsible for their education.

Of the identified pending actions, the need to create a learning evaluation model that allows the teacher to know the student's profile stands out. Therefore, it is proposed that through data mining, the student's trajectory be nurtured so that the didactic interaction and the dialogue strengthen the formative evaluation and achieve the student's autonomy.

In addition, it would be necessary to carry out deep educational research on new didactic, instructional and operational designs that guarantee the evaluation and feedback of learning as a strategy to improve. The need to guide instructional design work to create distance learning environments with a multi-route curricular structure with the possibility of developing the same learning content for different disciplines was triggered.

Finally, evaluating is not qualifying; it is necessary to develop a learning environment where the teacher and students have the possibility of dialogue and interaction, having as a teaching strategy the distribution of study materials and assignment of tasks to be carried out through digital knowledge they can reorient the learning contents and promote a reflective dialogue that positions the evaluation in the act of learning.

Based on the results found in this research, it is suggested to carry out future educational research that motivates the search for new proposals for solutions to the problems, needs, and situations of the present context of the evaluation of learning in distance education.

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