The social utility of naturalistic knowledge from action research for social impact in Ibero-America

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Abstract

The results presented at the Conference of Emerging Researchers of the European Educational Research Association [EERA] in Nicosia, Cyprus, as well as the results of the scientific dissemination processes developed in the academic mobility developed from July 7 to August 31 at the Faculty of Education Sciences of the University of Granada are presented. The social utility of knowledge and the relationship of knowledge with society is a multidimensional problem for universities, because it involves a series of far-reaching situated processes that involve several dimensions: Utility and use of scientific and technological knowledge, Emerging Educational Contexts, University Development, Administration of education and educational management. Allowing to answer: What is the purpose of scientific knowledge and for whom is it beneficial? What relationships are promoted between teachers and students according to the different interpretations of the utility of knowledge? and Who plays a role in defining the social utility of knowledge for social justice? Our results identify a Model of Social Utility of Knowledge for Emerging University Contexts, for the mobilization of knowledge.

Keywords: Use of scientific and technological knowledge, Emerging educational contexts, University development, Educational management

Resumen

Se presentan los resultados expuestos en la Conferencia de Investigadores Emergentes de la Asociación Europea de Investigación Educativa [EERA] en Nicosia, Chipre, como de los resultados de los procesos de divulgación científica elaborados en la movilidad académica desarrollada del 07 de julio al 31 de agosto en la Facultad de Ciencias de la Educación de la Universidad de Granada. La utilidad social del conocimiento y la relación del conocimiento con la sociedad es un problema multidimensional para las universidades, debido a que involucra una serie de procesos situados de largo alcance que involucran varias dimensiones: Utilidad y uso del conocimiento científico y tecnológico, Contextos Educativos Emergentes, Desarrollo Universitario, Administración de la educación y gestión educativa. Permitiendo responder: ¿Cuál es el propósito del conocimiento científico y para quién es beneficioso?; ¿Qué relaciones se promueven entre profesores y estudiantes según las diferentes interpretaciones de la utilidad del conocimiento? y ¿Quién juega un papel en la definición de la utilidad social del conocimiento para la justicia social? Nuestros resultados identifican un Modelo de utilidad social del conocimiento para contextos universitarios emergentes, para la movilización del conocimiento.

Palabras claves: Uso del conocimiento científico y tecnológico, Contextos educativos emergentes, Desarrollo universitario, Gestión educativa

Περίληψη

Παρουσιάζονται τα αποτελέσματα που παρουσιάστηκαν στο Συνέδριο Αναδυόμενων Ερευνητών της Ευρωπαϊκής Ένωσης Εκπαιδευτικής Έρευνας [EERA] στη Λευκωσία, Κύπρος, καθώς και τα αποτελέσματα των διαδικασιών επιστημονικής διάδοσης που αναπτύχθηκαν στην ακαδημαϊκή κινητικότητα που αναπτύχθηκε από τις 7 Ιουλίου έως τις 31 Αυγούστου στη Σχολή Επιστημών της Αγωγής του Πανεπιστημίου της Γρανάδας. Η κοινωνική χρησιμότητα της γνώσης και η σχέση της γνώσης με την κοινωνία είναι ένα πολυδιάστατο πρόβλημα για τα πανεπιστήμια, διότι περιλαμβάνει μια σειρά από μακροπρόθεσμες διαδικασίες που περιλαμβάνουν διάφορες διαστάσεις: χρησιμότητα και χρήση της επιστημονικής και τεχνολογικής γνώσης, αναδυόμενα εκπαιδευτικά πλαίσια, πανεπιστημιακή ανάπτυξη. , εκπαιδευτική διοίκηση και εκπαιδευτική διαχείριση. Επιτρέποντάς σας να απαντήσετε: Ποιος είναι ο σκοπός της επιστημονικής γνώσης και για ποιους είναι ωφέλιμη; Ποιες σχέσεις προωθούνται μεταξύ εκπαιδευτικών και μαθητών, σύμφωνα με διαφορετικές ερμηνείες της χρησιμότητας της γνώσης; Και ποιος παίζει ρόλο στον καθορισμό της κοινωνικής χρησιμότητας της γνώσης για την κοινωνική δικαιοσύνη; Τα αποτελέσματά μας προσδιορίζουν ένα μοντέλο κοινωνικής χρησιμότητας της γνώσης για αναδυόμενα πανεπιστημιακά πλαίσια, για την κινητοποίηση της γνώσης.

Λέξεις κλειδιά: Χρήση επιστημονικής και τεχνολογικής γνώσης, Αναδυόμενα εκπαιδευτικά πλαίσια, Πανεπιστημιακή ανάπτυξη, Εκπαιδευτική διαχείριση

Nicosia, Cyprus. August 26, 2024

EERA Network: **99. Emerging Researchers' Group (for presentation at EmergingResearchers' Conference)**

Hello, good day to everyone, My name is Rodolfo Jiménez Leon, I am a postdoctoral student at the Autonomous University of Yucatán in Mexico, and as a university professor at the Autonomous Juárez University of Tabasco, I have done an international stay at the University of Granada in Spain, due to the Spanish-Mexican relations with the Ibero-American University Postgraduate Association, an international non-governmental organization, recognized by UNESCO.

Bilateral relations between Mexico and Spain over the years have transcended historical, cultural and social aspects, strengthening ties of cooperation in the educational field through the exchange of students, professors and researchers, and a large number of joint projects and activities of mutual interest.

The social utility of knowledge and the relationship of knowledge with society is a multidimensional problem for universities, because it involves a series of far-reaching processes that involve several dimensions. In this new era of uncertain times, quality education is required for all, cultivating scientific and technological vocations to train new researchers. Where users develop educational leadership, from a pedagogical perspective with educational intervention in social relevance for their communities.

This organizational transformation based on the management of knowledge based on science and technology makes us ask ourselves : How to generate knowledge for the social good? How to contribute to social transformation from tertiary education ? requiring decision-making from administration and educational policy.

Given this situation, we must intervene from our framework of action located in educational practice. Our research answers :

• What is the purpose of scientific knowledge and for whom is it beneficial ?

• What relationships are promoted between teachers and students according to the different interpretations of the usefulness of knowledge?

• Who plays a role in defining the social usefulness of knowledge for social justice?

Helping to solve the problems of social inclusion in educational areas with social, economic and cultural disadvantages, requires developing skills in teachers who serve the different educational levels, generating: Interpretive flexibility, which is the meaning of the use (even symbolic) of the artifact, knowledge, tool, technique, by different relevant social groups.

The methodology that our study follows is based on the creation of a free summer course located at the University of Yucatan, called: "Agile management for educational projects with qualitative methods" through 64 hours, we developed participatory action-research. We call it a case study.

Because the academic content was presented with the didactics in research based on art, developing skills: sensitivity, creativity, confidence, problem solving, perseverance, attention, concentration, non-verbal communication, constructive criticism and collaboration. Allowing:

• Strengthening the awareness of the subjects in the social process: Because teachers at different levels do not feel useful.

• It encourages subjects to participate in social development: Focusing on the profile of the teacher as a transformer of the educational community.

• Transformation of attitudes and behaviors: Based on the aforementioned skills.

• Active learning, construction of knowledge: Incorporation of research in teachers, based on qualitative research and data analysis techniques.

• It promotes personal development: We promote pedagogical leadership.

• It generates critical attitudes and professional renewal: It establishes the need for renewal of the teaching staff in educational institutions, promoting generational change.

• It implies participation and modification of the environment: Fair educational spaces.

With the arts we offer teachers instances of encounter and change in consciousness, since it promotes a self-examination of what is done, both in pedagogical and artistic practices. Access to new forms and approaches in the construction of knowledge. It promotes a new relationship with knowledge, since learning is not centered on the figure of the teacher, but on the learning process: posing conjectures, personally and collectively, and making connections between school work with works, authors and images from the history of art and visual culture.

• From education and pedagogy it is necessary to ask the "what" (contents), the "how" (teaching methodologies), the "for what", the "why", the "who teaches", "who learns", "in what context" and "with what resources". The answers to these questions become more important. relevance when research is assumed as the main pedagogical strategy.

In addition, a sample of the application of the projects carried out in the subject was developed. With this, the teachers presented the current problems in their environments. Generating motivation, establishing playful methodologies and favoring the teacher-student relationship through tutoring.

We believe that learning is collaborative from different paradigms, whether humanistic, sociocultural or constructivist. Our Model of social utility of knowledge for emerging university contexts favors educational administration, users, promotes the relationship of science with society, generates social utility through relevance.

To conclude, this movement promotes qualitative research to find better ways of learning and living, confirming the importance of designing programs to generate social utility of knowledge through the solution of national problems.

To understand the reality of phenomena in their natural being, in their true nature, as the name of the paradigm itself indicates, qualitative, phenomenological, naturalistic, humanistic or ethnographic, of a descriptive, comprehensive and holistic nature.

Thank you very much for your attention.

Table 1

Systematic literature review

Author	Dimension	Underdimension	Description	Findings
Estébanez (2006)	Social Utility of Knowledge Utility and use of scientific and technological knowledge	Intermediation	Analysis of the circulation and use of scientific and technological knowledge in society, based on case studies of university-business links, with an economic approach to innovation processes.	Links that occur between scientific actors and other social actors, the state, NGOs, under the logic of the market. Sociological studies on science, scientific policies and the construction of public policies, focused on the formulation of the problem of intermediations between scientific knowledge and state action in the field of social welfare. The following processes are identified: • Diffusion or dissemination of knowledge from the scientific and technological system. • Links and transfer between the scientific, governmental, business and non-profit sectors. • Circulation of scientific and technological knowledge through various socializing channels such as mass media, the education system, professions and social movements.
		Scientific advice	As an area of information on social policies and decision-making. This activity, which can be classified as an intermediation level as a process of linking and transfer, has gained relevance in recent times and is defined as the contribution of science to politics or the decision-making process. It is a process that links at least two well-defined sectors: Producers of scientific and technological knowledge as advisors, and the state as a user of the process and the mode of development. Other social actors (citizen organizations, interest groups or the general public) and the media are also part of it.	Scientific advice is presented in the following forms: Advisory committees made up of scientists who merge into government agencies. Consultation processes with scientists in the face of a crisis or problem. Science and technology advisors to legislatures. Presence of scientists in technical or political government functions. Public and private foresight.
		Interpretation models based on the existence of interactive processes Processes of production and transfer of scientific and technological knowledge Social belonging	Significance of the production of scientific knowledge in relation to addressing social problems in the environment.	Instances of science-society relationship, network of actors, flows of knowledge and practices, being the object and different strategies of analysis. Methodologies based on the identification of the various processes: Landry et al., (2001); Spaapen et al., (1999) in the processes of production, mediation (transport of knowledge from its source to other actors and areas) and use and application for the achievement of practical objectives
		Role of product and disseminator of knowledge in Science and Technology (S&T)	Its characterization provides information on potential social utility.	Example: Existence of researchers and relevant scientific production on a certain topic.
		Intermediation between the knowledge produced and the final beneficiaries.	Specific actions to link the scientific and technological sector and various institutional areas, as well as the more generic processes of circulation and dissemination of scientific knowledge in society.	Example: Government agencies that have scientific advisory councils, scientific updating bodies.
		Analysis of the use of scientific and technological knowledge or goods, services or actions of various institutional sectors.	Knowledge supply, knowledge flows or incorporated knowledge.	Example: Use of non-polluting technologies for the provision of rural electricity.
		Analysis of the effects.	Positive or negative effects on the population of the incorporation of scientific and technological knowledge into social practices, habits and institutions.	Example: Health effects of using a new vaccine, effects of access to information
		Diffusion	Term widely used to describe a wide variety of processes related to the flow of scientific and technological knowledge to society.	It applies to a very specific action of scientific researchers when they communicate their knowledge in a technological sense; reference is made to the diffusion of technology to refer to the expansion of the use of a technology.
		Dissemination of knowledge	In a restricted sense, such as the usual communication actions carried out by the scientific community itself, whether of the research carried out and its results, as well as of the scientific and technological knowledge available.	Dissemination outside the scientific and technological system involves the dissemination of information to other social sectors and is therefore a more relevant process for the analysis of the impact of science and its usefulness. Through these activities, scientific researchers reach audiences that are broader than the immediate consumer, which is the scientific community itself.
		Modes of dissemination of scientific knowledge	The type of publication in which a scientific work is disseminated.	It includes the following actions: Teaching activity at any level of the formal education system. Participation in non-formal education areas.

Author	Dimension	Underdimension	Description	Findings
				Participation in seminars, training workshops. Presentation of papers at conferences, seminars and events of a similar nature.
		Flows of scientific and technological knowledge	Coming from various educational and communicative actions in their most diffuse nature.	The circulation of scientific knowledge in society can come from the ways in which mass media intervene in the communication of science; the teaching of science and technology at various educational levels; access by different professions to the latest advances in scientific research and scientific information available to interest groups (political parties, unions, social movements, NGOs in general).
		Linking and transfer processes	The identification and characterization of the areas of encounter between individuals and groups interested in the exchange of knowledge.	Informal contacts and non-institutionalized relationships are the basis for establishing a link between producers and users of knowledge. There are various social circumstances that favor this link. Any of the actions indicated above for the dissemination processes offer opportunities for encounter and interaction for both parties that can lead to the beginning of informal relationships.
		Typology of knowledge exchange	Impact on the nature and development of interactions	Type of activity that constitutes the exchange. Organizational structures that manage the link. Regulations that govern the transfer. The actors involved. The interests and objectives of each party. The specific purpose of each activity involved. The type of knowledge that is the object of exchange. The format in which it is transmitted. The interface mechanisms between parties.
		Link between human action and knowledge	Relevant axes of modern economic and sociological theory	The problem is raised in terms of the utility or use of knowledge. The idea of social utility of scientific knowledge refers to various meanings. (1) Process of interpretation of knowledge, on which there is an interest in appropriation. Process of interaction between social actors involved in a variable manner, including the dynamics of interaction of these actors with it (realization, appropriation, re-signification, attribution of symbolic value, etc.). Utility can be considered useful or not, it is not something that derives from the nature of the object, but from the expectations and evaluations of use. As regards the social, the idea of utility is a conjunction of the expectations and evaluations of utility wielded by the different actors involved in a scene of knowledge flow (Vaccarezza and Zabala, 2002). (2) Utility must be distinguished from the process of effective and efficient use of knowledge for certain purposes. The process of construction of the meaning of utility of a certain knowledge is only analytically discernible from the process of use of knowledge. It is analytically discernible with the use of knowledge, it refers to a specific plane that consists of the social justification of the object (Vaccarezza and Zabala, 2022).
		User	Users are, in turn, subjects of impact, whether as beneficiaries or harmed by the effects of such use.	The use of scientific and technological knowledge implies the constitution of a "user" who appropriates, not necessarily in legal or economic terms, the knowledge for its incorporation into an activity. Intermediate user: A company incorporates research results into software for the development of a new product for the market. A government agency in the public health area that designs a new health policy after receiving scientific advice on the mode of transmission of a new disease.

Author	Dimension	Underdimension	Description	Findings
				A non-profit environmental organization that, based on new scientific evidence on the effects of genetically modified foods, develops an action plan aimed at consumers. On the other hand, the situation of the end user is presented as follows: A company that incorporates new information and communication technologies to improve its management. Rural residents who replace diesel power plants with new electricity generation technologies, such as wind generators. Population that changes eating habits based on the dissemination of new knowledge on the effects of genetically modified foods on health.
		Analysis of the social impact of science and technology	Development of a study to identify knowledge acquisition formats. Surveys are applied to users of scientific and technological services, allowing for broad coverage of entities and individuals linked to certain knowledge providers.	The university system, from a sectoral perspective, addresses this process by reconstructing the supply and use chains of scientific and technological knowledge. The main dimensions to be considered are: Characteristics of user institutions: main activity, type of entity (public, private, non-profit, national, foreign). Identification of networks of actors involved. Sources of knowledge used/modes of identification and linkage with said sources. Purposes of use of scientific and technological knowledge. Types of knowledge used. Final beneficiaries.
		When the user is the state	The various government agencies may be considered analogous to innovative firms by incorporating scientific and technological knowledge into their production practices.	The design of public policies and social programs. The evaluation, monitoring and follow-up of the actions applied. The elaboration and application of regulations, including legislation. The training and technical assistance of social projects supported by the state.
		Scientific advice and public policies and use of knowledge	To help the government think (Weiss, 1992), the mobilization of intellectual resources and their participation in the rationality of public policies. It provides frameworks of thought and multiple perspectives to understand social problems in their increasing complexity and legitimizing resources to support government actions.	Comprehensive theory of knowledge use (Landry et al (2001)- The knowledge produced by the social sciences adopts other uses or applications, research is incorporated as support for political positions, provides legitimacy and justification to projects, and grants credibility to the selected options. As is meant by the notion of knowledge use in the studies carried out to date on the extent and determinants of the use of scientific or academic knowledge in public administration, the idea of use implies certain underlying assumptions that need to be problematized.
Alonso y Naidorf (2019)	Social Utility of Knowledge	Social function	Able to measure the capacity to fulfill the function or social role expected of science and the production of knowledge. The inquiry into definitions of utility forces us to ask: • How should the utility of knowledge be investigated? • What is useful scientific knowledge? • What is scientific knowledge useful for and for whom? • What type of relationship between academics and users corresponds to the different conceptions of the usefulness of knowledge? • Who is involved in constructing the definition of utility? • How is knowledge used?	Polanyi (1968), has a “social function” and an “evident utility”. The science-society relationship: questioning the linear model of knowledge production and its valuation by mere accumulation as stock, interpretation models based on the existence of interactive processes between the scientific community, the state and the market. New ways of characterizing the profile of the researcher, orienting consideration towards the definition of research topics based on the solution to social problems and establishing dialogues with the potential user of the results.
	Social utility of scientific knowledge.	Science-society relationship	Review the relationship between the State and science and technology, crystallize the direction of research and promote processes of appropriation of scientific and technological knowledge, seeking to establish the question of the usefulness of knowledge - in the different senses in which this is interpreted - in the distribution of funds and as a form of control of the results obtained.	Dimension of analysis, central theoretical category: the social utility of scientific knowledge
		Problem of the usefulness of knowledge	It represents a complex and multidimensional social phenomenon: it involves a series of situated and far-reaching processes that involve several dimensions (material, symbolic, cognitive, political, epistemological, etc.) and is composed of a set of differential relationships between different elements (artifacts, individual agents, senses/significations, groups, collectives, institutions, etc.).	Mode 2 of knowledge production developed by Gibbons et al. (2010) and the Triple Helix approach developed mainly by Leydesdorff and Etzkowitz (2000)

Author	Dimension	Underdimension	Description	Findings
			The different ways of producing knowledge in Latin American research centers determine the practices of research and knowledge transfer: the scientific staff, the "knowledge project," the administrative and financial practices of the institution in which the research groups operate, and the "interlocutors."	Mode 2 of knowledge production is characterized by networking, inter-institutional, multidisciplinary work, with the participation of heterogeneous actors in the knowledge process. The model known as the Triple Helix developed by Etzkowitz and Leydesdorff (2000) takes an institutional approach to the application of knowledge, taking into account the relationship between the company, the government and the university and emphasizing the system of recursive relationships between them. For these authors, the university plays an essential role in technological and regional development, which goes beyond its traditional role as a provider of training and basic knowledge, to redefine itself in the role of an economic institution or "industrial actor", stimulated by the processes of competitiveness unleashed by the phenomenon of globalization.
		The role of groups in the processes of production and dissemination of knowledge	These are alliances that researchers establish with other actors in order to transform their own ideas into recognized facts. These alliances are formed with the objective of getting other actors interested in the need for knowledge that researchers generate and are called actor networks (See Echeverría and González, 2009).	Interpretive flexibility: meaning of use (including symbolic) of the artifact by the different relevant social groups (Vaccarezza & Zabala, 2002: 35).
		Subordinate integration or the so-called CANA phenomenon (Applicable Knowledge Not Applied) (Kreimer & Thomas, 2004)	The subjective dimension of the subject producing knowledge when exploring the strategies of researchers in their effort to make their research products binding on the market (Vaccarezza & Zabala, 2002).	For these authors, "the question of social utility is raised as an attribution of meaning by the researcher or a subjective utility, meaning by this the subjective expectation of the researcher regarding the utility of the object for other agents" (Vaccarezza & Zabala, 2002: 35).
		Symbolic capital	In another sense, we can start from the meaning of utility by relating it to the concept of symbolic capital and credit of Bourdieu (2003) or credibility of Latour and Woolgar (1997). We could consider the utility of knowledge in terms of the magnitude of profitability or scientific benefit of the investments made by those who invest resources in research.	In this sense, we would be pairing the concept of utility with that of profitability, and the former would refer to the terms of "exchange value" of knowledge (not only relative to the monetary economy but also to the symbolic and cultural economy of science), with ignorance of the "use value" of knowledge. However, the main idea of utility, that is, the object of analysis will be referred to the perception of "utility as attribution of use" (to use this redundant expression) of knowledge by the researcher and the "users" of knowledge, in this case, the demanders and adopters.
		Mobilization of knowledge	The concept suggests that the knowledge production process should be oriented towards the production of knowledge "ready for action", which implies going beyond its dissemination, while it also defines the researcher's function as finding paths that link the production and use of the knowledge produced (Naidorf, 2014; Fischman, 2011; Sá, 2011).	Nutley et al. (2007) approach the concept of knowledge mobilization by considering research results as evidence for use in public policy decision-making. Bennet et al. (2007) understand the category as the method or tool that facilitates the translation of research results into action. The authors of this approach define "transfer" as a dynamic and interactive process that includes the synthesis, dissemination, exchange and application of knowledge. Effective (or successful) transfer, the authors argue, results from the combination of intensity, complexity and level of commitment.
		Knowledge Transformers	Recover, correct, contextualize accumulated usable knowledge, transforming it into something specifically useful for a new context, thus consolidating an act of use.	(Benneworth et al., 2020)
		Stakeholders	(Molas-Gallart et al., 2002)	
		Knowledge brokers	(Schlierf y Meyer, 2013)	
		Innovation for social inclusion.	It is built in tension with the social demands that provoke it and with its capacity to meet them.	Redefining research problems by identifying social inclusion issues and trying to resolve them: "academic research can make a contribution directly aimed at helping to solve social inclusion problems, beyond the indirect contributions it may eventually make through economic development and its subsequent distribution" (Alzugaray, Mederos & Sutz, 2011).
		Methodology	The general methodological strategy is qualitative, oriented towards empirical exploration and conceptual generation. It is assumed that qualitative research is characterized by its four principles (Crowson, 1998): a) the central principle of the search for understanding; b) the norm of the proximity of the researcher to the object; c) the emphasis on the inductive work of the reality investigated; and d) the recognition of the evaluative context of the research.	This is considered to be the most suitable approach to develop this study since it places emphasis on ensuring that phenomena are intelligible in their specificity. Understanding involves capturing the meaning that people attribute to discourses and actions, as well as the dialectical and historical framework that gives meaning to these actions. It includes the interpretation of the actors' frame of reference and their inclusion in the socio-historical-political context.

Author	Dimension	Underdimension	Description	Findings
		Perceived usefulness	It is a puzzle generator and puzzle solver.	
Sánchez Quintero, J. (2018)	Education Administration	Linear model	Based on basic research and applied research, technological development is achieved and production is generated, leading to economic competitiveness and from this to social progress. Linear logic is understood as the automatic cause-effect relationship in which each effect is considered the implicit consequence of a single thing. In the 21st century, realities are multi-causal and multi-consequential, with various variables and categories interacting under different relationships and logics that are not always unidirectional.	The author therefore identifies that it is necessary to think about science, technology, political education and administration from different perspectives than those that have prevailed. It is necessary to transform the organizations in which the educational experience is lived, science is generated and technology is produced. Without quality education for all, it would be impossible to cultivate scientific and technological vocations to train new researchers. Organizational transformation, education, science and technology therefore delimit the minimum pyramid base on which the development we seek can be based. Of these four basic factors, the most important one that we can most directly affect is education. The mission proposes to immediately focus on its transformation.
		Actor Network Theory (ANT)	It is a framework for understanding scientific facts as the result of interpretations agreed upon by the conveniences of members of networks or communities and not by neutral views. Furthermore, it could be a framework for understanding that there is no ideal education that places students in continuous deficit, but rather it deals with processes and people emerging through their interconnections in networks, where their nature and behavior are never inherent but produced through continuous interactions and negotiations.	According to Greiff and Maldonado (2011), the public must know how science operates as a social practice in specific political contexts. Citizens must be trained to know how to ask what implications this or that techno-scientific development has for their community (costs, risks, benefits).
		Critical pedagogy	Facing the manifestations of the unhealthy exercise of power attempts to answer the question: What are the behaviors or aspects through which unhealthy power is manifested? What critical and alternative forms could be brought to education? How could critical forms be brought to education? Proposing that this occurs through research and related methods such as Problem-Based Learning, Questions and Projects. Pedagogy is an organized knowledge related to the conditions under which teaching occurs, deliberately oriented to generate learning from the implementation of methods that allow to give better meaning to educational practice. It is clear that the educational project determines the pedagogical project and that this in turn is closely related to the approaches, conceptions, tendencies and pedagogical currents associated with the political and social project that is undertaken and the methodologies and didactics that teachers use. An "ethical-critical" pedagogy and education, as Ovelar (2004) calls it, allows the formation of autonomous human beings or those capable of thinking and acting for themselves, as was the ideal of the Enlightenment and of Kant. In relation to autonomy, it is constituted by the experiences in which I freely and responsibly choose, decide, and make decisions. There cannot be citizens without autonomy. An autonomy that allows one to think, discern, understand, question, compare, choose, and also build. Autonomy takes the citizen out of the unifying and alienating current that predominates in the consumer society, where the reason of the market, the party, the leader, the government, or tradition prevails. And where people gradually lose their right to decide, to choose, that is, they lose their autonomy and their critical capacity. In educational praxis, it is vital to stimulate this critical capacity in the face of knowledge, texts, forms of organization, and decision-making. It is about promoting alternative interpretations of the world and also achieving the creation and recreation of meanings and values.	Pedagogy, Education, Teaching and Learning are closely related. The educational project determines the pedagogical project. The justification, the model of humanity and society that are embodied in an educational project, can make some pedagogies more relevant than others. The educational project of savage capitalism, fascism and Nazism certainly differs from socialist or democratic capitalist educational projects, since both obey different currents, tendencies, conceptions and approaches; that is, in each educational project, ideas and beliefs are privileged and others are abandoned. Foucault (2016) states that every educational system is a political way of maintaining or modifying the adequacy of discourses, with the knowledge and powers that they imply (p.86). The discourses that are generated with the type of education, pedagogy, didactics and methodologies that are used are neutral; On the contrary, they are loaded with interests, visions, desires and positions regarding their own life, that of others, society and the world. According to Foucault, cited by Bedoya and Gómez (1989), a teaching system is a ritualization of speech, a qualification and a fixation of the functions for the subjects of speech, the constitution of a doctrinal group and a distribution and an appropriation of the discourse with its powers and knowledge. From education and pedagogy, it is necessary to ask the "what" (contents), the "how" (teaching methodologies), the "for what", the "why", the "who teaches", "who learns", "in what context" and "with what resources". The answers to these questions become more relevant when research is assumed as the main pedagogical strategy. Ethics, Autonomy, Dignity, democracy, technology, information, communication, production of knowledge (research) and immaterial work through imagination are key categories from which the new realities of education and pedagogy are configured.

Author	Dimension	Underdimension	Description	Findings
Roberto, y Weinstein (2024).	Educational management	Pedagogical leadership	Known as instructional leadership, it has been studied extensively to identify its impact on student learning. Research on effective schools shows that strong leadership generally occurs when "there are learning climates free of disruption, a clear set of instructional goals, and high teacher expectations of students" (Robinson et al., 2014, p. 16).	five main dimensions: i) setting goals and expectations; ii) allocating resources strategically; iii) ensuring quality teaching; iv) leading teacher learning and training; v) ensuring an orderly and supportive environment. Similarly, this analysis identified three practices related to teacher professional development: i) subsidizing and organizing teacher learning and training; ii) actively engaging in teacher training, modeling and leading learning; iii) promoting collaborative work among teachers and collective responsibility for student learning.
		School management	This complexity is distributed across five axes: students, teachers, pedagogical coordination, school organization and educational policy.	(i) the number of students and teachers; (ii) (the number and types of levels offered - Early Childhood Education, Elementary Education I and II, Secondary Education, Vocational Education, Youth and Adult Education -; and (iii) the number of school days (morning, afternoon and evening) produce different levels of complexity in terms of school management.
Silva-Díaz et al., (2023)	Emerging Educational Contexts	STEAM	Promote scientific-technological vocations through the use of Emerging Technologies and STEAM Education in students belonging to educational centers located in vulnerable contexts	Use of cutting-edge technological tools: a) Immersive Virtual Reality (IVR) b) Educational Robotics c) Maker Culture (3D Printing) Through the STEM methodology, which encourages the development of both scientific-technological skills and social and communication skills. In addition, through this project, a culture of innovation and creativity is promoted among the participants. Within the general resources and content that will be addressed during the project (and that will be adapted according to the educational content considered most appropriate by the center's teachers), the following aspects are included: - Digital Skills. - Immersive Technologies (Virtual, Augmented and Mixed Reality). - Computational thinking and block programming. - Educational Robotics (mBot). - Use of electronic boards for the development of projects (Arduino and Micro: bit). − CoSpaces as a platform for the creation of virtual learning environments (3D). − Digital resources for scientific dissemination. − STEAM teaching-learning projects. Use of the "S-STEM" instrument (Unfried et al., 2015) which has been translated into Spanish by the researchers. The instrument has 30 Likert scale items (1 - 5) distributed in three dimensions; A) Mathematics (10), B) Science (9) and C) Engineering and Technology (11).
Sánchez-Caballé et al., (2019).	Emerging Educational Contexts	Research in educational technology Digital competence	Somerville et al., (2008) The model proposed by the Educational Testing Service (ETS) is one of the most popular. It proposes iSkills, which are an instrument designed to evaluate and certify skills related to critical thinking in the technological and digital context. From 2000 onwards, they developed the ICT Literacy Framework model, which defines digital literacy as the ability to use digital technologies, different communication tools and networks in order to solve problems, always considering ethical and legal terms of access to information. Specifically, they list a total of seven skills: 1. Define: understand and articulate the search for digital information. 2. Access: Locate or retrieve information in digital environments.	Larraz (2013) in his unifying vision of the concept of digital competence: Informational: It consists of knowing how to handle digital information. Technological: It consists of the treatment of information in different formats digitally. Multimedia: It consists of the analysis and creation of multimedia messages. Communicative: It refers to participation, communication and a digital identity. The bases of the concept of Digital Competence in relation to learning, advances are observed in educational research, a validated rubric has been

Author	Dimension	Underdimension	Description	Findings
			3. Evaluate: Judge whether the information meets needs and is relevant. 4. Manage: Organize, manage and store digital information. 5. Integrate: interpret and represent information. 6. Create: Adapt, design or build information in digital environments. 7. Communicate: adapt information in a way that is appropriate to the target audience. Eshet-Alkalai (2004) This corresponds to the most holistic conceptual model of digital literacy that does not focus on computer aspects. It includes a variety of literacies that consider various cognitive, action, dialogic and emotional aspects that a 21st century citizen must have in order to develop effectively in digital environments. Specifically, it proposes the competence as the sum of the following literacies: 1. Photo-visual literacy, the art of reading visual representations. 2. Reproductive literacy, the art of creatively recycling existing materials. 3. Branched literacy, hypermedia and non-linear thinking. 4. Informal literacy, the art of skepticism. 5. Socio-emotional literacy. ISTE (2007). The International Society for Technology in Education (ISTE) proposes a CD framework that is developed from several standards called National Educational Technology Standards (NETS). The standards correspond to: 1. Creativity and innovation 2. Communication and collaboration 3. Information search and flow. 4. Critical thinking, problem solving and decision making. 5. Digital citizenship. 6. Technological concepts and actions. Mozilla Web Literacy (2015) is the framework proposed by Mozilla in order to be a guide to exercising good web citizenship. To do so, each user must have four skills corresponding to the digital age: 1. Reading 2. Writing 3. Participation 4. The 21C Skills that correspond to the set of knowledge, skills and work habits necessary to be ethical in today's world. Carretero et al., (2017). The model proposed by the Institute for Prospective Technological Studies (IPTS) Digcomp 2.1. is the updated continuation of Digcomp 2.0 (Vuorikari et al., 2016) and Digcomp (Ferrari, 2012). This most recent model focuses on expanding the three initial levels of competence into eight more detailed sub-levels and provides examples in order to facilitate the implementation of Digcomp. The proposed competences are grouped into five areas, which are: 1. Information and data literacy, that is, searching, evaluating and managing information and digital content. 2. Communication and collaboration through digital technologies, sharing content, participating in online citizenship following the rules of network participation called netiquette and managing digital identity. 3. Creation of digital content by developing digital content, reworking it and integrating it, taking into account licenses and copyrights. 4. Security regarding the protection of devices, personal data, health and the environment. 5. Technical problem solving, identification of technological needs and responses, creative use of technology and identification of technical problems.	established, and instruments have been created that allow for initial diagnostic evaluation. Actions of digital competence: Read Define: Understand and articulate the search for digital information (Somerville et al., 2008). Access: Collect or retrieve information in digital environments (Somerville et al., 2008). Manage: Organize, manage and store digital information (Somerville et al., 2008). Evaluate: Judge whether information meets needs and is relevant (Somerville et al., 2008). Photo-visual literacy, the art of reading visual representations (Eshet-Alkai, 2004). Information literacy, the art of skepticism (Eshet-Alkai, 2004). Information seeking and influx: ISTE (2007). Reading: The Mozilla Web Literacy (2015). Information and data literacy, i.e., searching, evaluating, and managing information and digital content (Carretero et al., 2017). Create Integrate: Interpret and represent information (Somerville et al., 2008). Create: Adapt, design, or construct information in digital environments (Somerville et al., 2008). Critical thinking, problem solving, and decision making (ISTE, 2007). Reproductive literacy, the art of creatively recycling existing materials (Eshet-Alkaiai, 2004). Creativity and innovation (ISTE 2007). Writing: Mozilla Web Literacy (2015). Digital content creation: developing, reworking and integrating digital content, taking into account licenses and copyright (Carretero et al., 2017). Communicating: Communicating: Adapting information in a way that is appropriate to the target audience (Somerville et al., 2008). Socio-emotional literacy (Eshet-Alkalai, 2004). Communication and collaboration (ISTE, 2007). Digital citizenship (ISTE, 2007). Participation: Mozilla Web Literacy (2015). Communication and collaboration through digital technologies, sharing content, participating in online citizenship following the network participation rules called netiquette and managing digital identity (Carretero et al., 2017).
European Commission. (2024).	Emerging educational contexts	Capabilities and competitiveness	Employers are now looking for a combination of technical skills and soft skills such as problem-solving, critical thinking and communication. The need for	Woolford et al., (2024). Between 8 and 10% of funded projects concerned activities related to S3-relevant skills. This represented around €24 billion (11%) of ERDF investment and €14.9 billion (17%) of ESF investment.

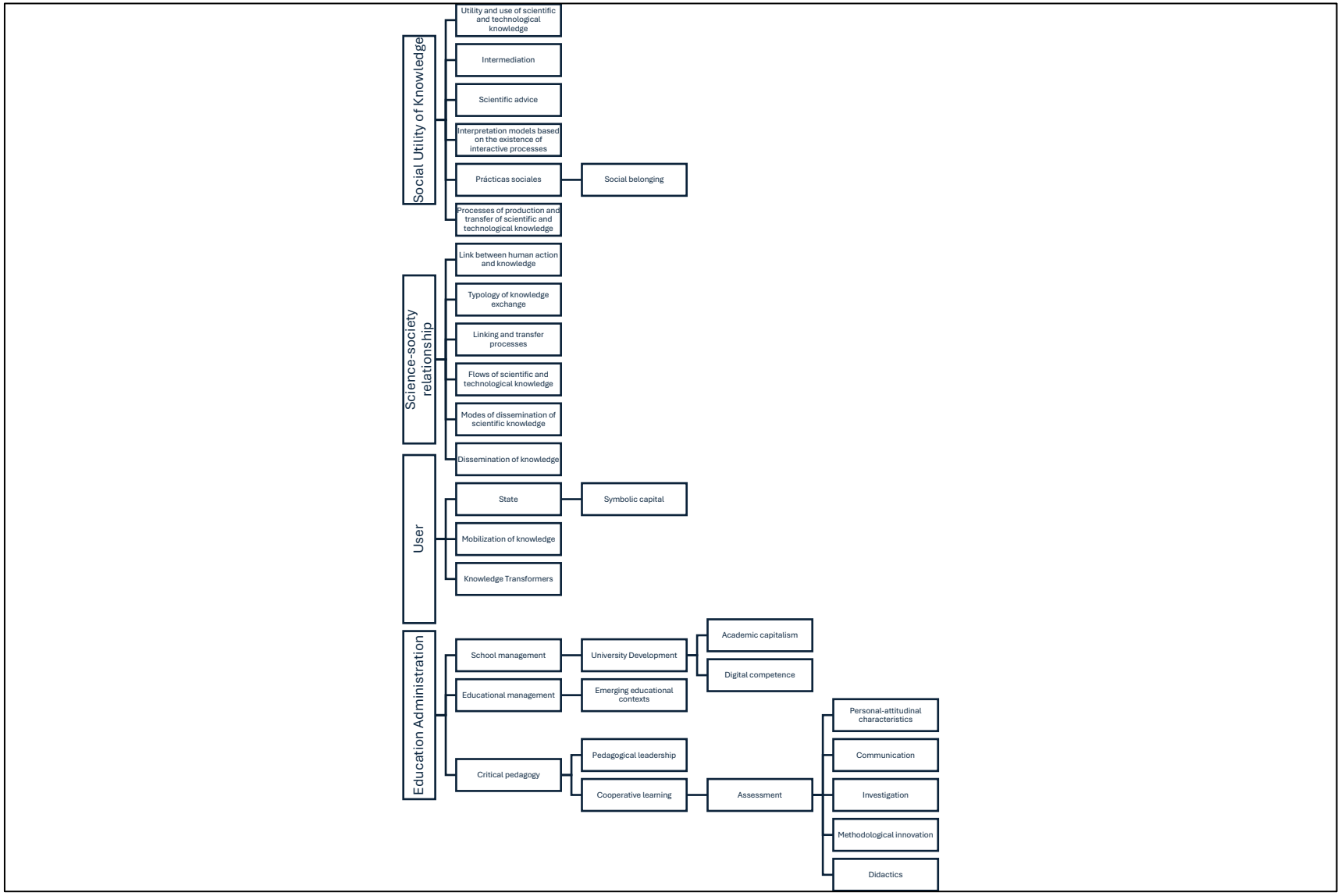
Author	Dimension	Underdimension	Description	Findings
			continuous learning and development is imperative to keep up with industry changes and technological advancements. The need for continuous learning and development is imperative to keep up with industry changes and technological advancements. However, challenges remain. Lack of qualifications in various industries poses a significant threat to competitiveness at both individual and national levels. This gap is often exacerbated by education systems that do not align perfectly with market demands. Furthermore, the pressures of competitiveness can lead to issues such as workplace stress and concerns about work-life balance.	Furthermore, around 9% of all analysed ERDF and ESF main beneficiaries were identified as Higher Education Institutes (HEIs), and in particular, 1% of all ERDF (approx. 6,130 projects) and 4% of all ESF (approx. 2,580 projects) correspond to S3 skills projects led by an HEI.
Vuorikar et al., (2022)	Emerging educational contexts	Digital competence	The Digital Competence Framework for Citizens (DigComp) has provided a basis for framing digital competences policy, in the development of a European Certificate of Digital Competences. In particular, emerging technologies such as Artificial Intelligence, virtual and augmented reality, robotisation, the Internet of Things, 'datafication' and new phenomena such as misinformation and disinformation have led to new and greater demands for digital literacy by citizens. There is also an increasing need to address the ecological and sustainability aspects of interaction with digital technologies. Maintaining the relevance of DigComp for learning, work and participation in society,	KNOWLEDGE: Means the result of the assimilation of information through learning. Knowledge is the set of facts, principles, theories and practices related to a field of work or study. SKILLS: They are the ability to apply knowledge and use basic practices to complete tasks and solve problems. In the context of the European Qualifications Framework, competences are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments). ATTITUDES: They are conceived as the motivators of performance, the basis for continued competent performance. They include values, aspirations and priorities.
Gallardo et al., (2022).	University Development	Cooperative learning	Teaching and learning processes in today's society (Casio, 2022, pp. 54-62): Behaviorist paradigm: Learning is the result of a permanent behavioral alteration in the student. Humanist paradigm: It places the student as the central axis of the learning process, highlighting their individuality. Sociocultural paradigm: The subject's involvement in a certain social and cultural reality facilitates the acquisition of knowledge about it. Constructivist paradigm: Students build and transform their own learning, the ability to learn to learn is emphasized. Cooperative learning has traditionally been conceptualized as a teaching-learning method in which students assume the active and direct role in the construction of their own knowledge, through group work with their peers (Johnson, 1999). Currently, authors such as Coll (2003) have enriched this approach, substantially distinguishing it from previous pedagogical models by giving greater prominence to the learner's interaction processes and understanding the partner's achievements as personal triumphs. The current conceptualization of cooperative learning therefore implies an orientation toward a common objective in a process in which each participant contributes his or her talent to obtain mutual benefits.	Cooperative learning is an alternative methodological proposal that breaks with the traditional molds of the traditional school based on the passivity of the student, teacher authority and transmission of mandatory memorized content. A group work model is presented where each personality assumes the essential role to achieve a common goal. Each student is configured as a puzzle piece without which the same would lack coherence, requiring the involvement and cooperation of the rest of the members. Sharan (2014) highlights the affinity of this work model with the principles of the inclusive school, by positively valuing diversity, understanding it as an enriching element of the teaching-learning processes from an integrative and non-exclusive perspective respecting differences. 1. Positive relationship 2. Stimulating interaction. 3. Psychological adjustment 4. Improvement of social skills 5. The milestones of the partner linked to one's own 6. Active role in the autonomous and shared construction of knowledge. Cooperative learning encourages the development of multiple intelligences, allowing us to address the functional diversity of all students. 1. Interpersonal intelligence: Develop prosocial skills. 2. Linguistic-verbal intelligence: Represent ideas, understand and be understood by others. 3. Intrapersonal intelligence: Plan and structure their thinking. Monereo and Duran (2001) identify: 1. Jigsaw. 2. Student Team Learning 3. Team Games Tournament (TGT) 4. Student TEAM Achievement Divisions (STAD) 5. Team Assisted Individualization (TAI) 6. Research group 7. Learning together 8. Reciprocal teaching

Author	Dimension	Underdimension	Description	Findings
				9. CO-OP CO-OP
Suárez et al., (2022)	University professional development	Assessment	The evaluation of participants contributes to the professional development of teachers in different university settings. Through four dimensions related to teaching: didactics, communication, research and personal-attitudinal characteristics. Another dimension refers to methodological innovation. This point is essential in improving the learning process of both the student and the teacher and sets the precedent for the necessary training of the teacher to do critical exercises of reflection and improvement through pedagogical research. The mastery of technological competence, assessing the pedagogical use of the tool. The didactic competence in terms of planning, evaluation; the communicative competence in order to gain student satisfaction; the management of the teaching-learning process and its assessment. All of this is the result of the traditional exercise of the teaching function and associated with it the dimension of methodological innovation that has been having greater presence in the most recent literature (Donado et al., 2018; Escobar, 2015; González et al., 2016; Luna and Reyes, 2015; Márquez and Madueño, 2016; Serrano et al., 2019). In the Latin American context, there is a similarity with Spain in that the student evaluates teaching, in general, for supervision purposes to improve student learning and methodological innovation associated with teacher training processes.	1) there are tensions regarding the disintegration and imbalance in the contributions of each participant to the professional development of teachers; 2) there is a predominance in the evaluation of similar dimensions by all participants essentially related to teaching and research, leaving a significant number of dimensions, characteristics and aptitudes of the teacher that contribute to professional development without relevance; 3) there is a use of methods that respond to segmentation by participant without being able to achieve a methodological coherence to achieve a relevant evaluation in aspects of training and professional development of the teacher.
Lavados-Montes, y Durán-Baéz, (2017).	University development	Academic capitalism	Within the approach of comparative political economy of national higher education systems, it implies the opening of public space for the participation of private non-profit institutions (philanthropic or commercial), also admitting, under other arrangements of academic capitalism, the presence of private institutions for profit.	The dynamics of neoliberal economies are incorporated into higher education institutions due to capitalist modernity according to: Capitalist transformation of academic work, expansion of HE provided by private agents, the managerial revolution around the new public management, the discipline of academic time, the production of HE for the market, the market making of HE, the link between university and productive sector in the perspective of the triple helix, the entrepreneurialization of academic institutions, the involvement of academic research with transfer and commercialization activities.

Note. Prepared by the authors according to the sources consulted at https://biblioteca.ugr.es/

Figure 1

Social utility model of knowledge for emerging university contexts


Social Utility of Knowledge
Utility and use of scientific and technological knowledge
Intermediation
Scientific advice
Interpretation models based on the existence of interactive processes
Prácticas sociales
Social belonging
Processes of production and transfer of scientific and technological knowledge
Science-society relationship
Link between human action and knowledge
Typology of knowledge exchange
Linking and transfer processes
Flows of scientific and technological knowledge
Modes of dissemination of scientific knowledge
Dissemination of knowledge
User
State
Symbolic capital
Mobilization of knowledge
Knowledge Transformers
Education Administration
School management
University Development
Academic capitalism
Digital competence
Educational management
Emerging educational contexts
Critical pedagogy
Pedagogical leadership
Cooperative learning
Assessment
Personal-attitudinal characteristics
Communication
Investigation
Methodological innovation
Didactics

Glossary

Educational Administration

Refers to the management and organization of educational systems, including the planning, direction, and supervision of activities and resources to achieve effective educational objectives (González 2020).

Social Agents

Individuals or groups that influence the development and functioning of the educational system, including teachers, parents, students, non-governmental organizations, and educational authorities (Martínez 2019).

Collaborative Learning

It is an educational approach in which students work together on activities and tasks, sharing knowledge and skills to achieve common goals (López 2018).

Lifelong Learning

It is the concept that education and learning continue throughout life, adapting to changes and developments in society and work (Fernández 2021).

Scientific Knowledge

It refers to knowledge generated through scientific methods, characterized by systematic observation, experimentation, and empirical validation (Rodríguez 2017).

Emerging Educational Contexts

These are new learning environments and scenarios that arise due to technological, social, and cultural changes, such as online education and virtual classrooms (Sánchez 2022).

Visual Data

These include graphs, diagrams, photographs, and other visual media that are used to represent and communicate information clearly and effectively (Gómez 2016).

Personal Development

It is the process of improving personal skills, knowledge, and abilities, fostering individual growth and the achievement of personal and professional goals (Méndez 2018).

University Development

It refers to the process of expansion and improvement of universities, including infrastructure, academic programs, and research initiatives (Pérez 2019).

Academic Performance

It is the measure of students' academic success, generally assessed through grades, exams, and other assessment criteria (Díaz 2017).

Quality Education

It refers to an educational system that provides effective and relevant teaching, ensuring the comprehensive development of students and their preparation for the future (Hernández 2016).

Liberating Education

It is an educational approach that seeks to empower students through awareness and critical action, promoting social justice and personal and community transformation (Álvarez 2015).

Higher Education

It is the level of post-secondary education offered by universities, colleges and other institutions that grant academic and professional degrees (Navarro 2020).

Phenomenological Epojé (PE)

It is the process of suspending judgments and preconceptions to analyze phenomena as they are presented in immediate experience, fundamental in phenomenology (Morales 2018).

Lived Experiences

In the context of phenomenology, it refers to personal and subjective experiences that are the focus of study to understand the meaning and essence of phenomena (Ortiz 2021).

Applied Hermeneutic Phenomenology (AHP)

It is an approach that combines phenomenology and hermeneutics to interpret and understand lived experiences, highlighting the context and subjective meaning (Ruiz 2019).

Educational Administrative Management

It refers to the organization and coordination of administrative resources and processes in educational institutions to achieve efficiency and effectiveness (García 2015).

Educational Management

It is the process of planning, organizing, directing and controlling resources and activities in the educational field to achieve established objectives (Ramírez 2017).

Critical Skills

They are the necessary capacities to analyze, evaluate and make informed and reflective decisions, essential for deep learning and problem solving (López 2018).

Social Inclusion

It is the process of ensuring that all individuals, regardless of their differences, have equal access to opportunities and resources, including education (Vega 2019).

Social Innovation

It refers to new strategies, concepts and ideas that respond to social needs effectively, improving the quality of life and strengthening community cohesion (Méndez 2018).

Internationalization

It is the process of integrating an international dimension into the teaching, research and service of educational institutions to improve cooperation and global understanding (Fernández 2021).

Action Research

It is a participatory research methodology that involves researchers and participants in a collaborative process to identify problems and develop practical solutions (Rodríguez 2017).

Educational Research

It is the systematic and rigorous study of educational processes and practices with the aim of improving teaching and learning (Sánchez 2022).

Social Justice

It is the concept of creating a society based on equality and solidarity ad, which understands and values human rights and the dignity of each person (Gómez 2016).

Leadership

It is the ability to influence and motivate others to achieve common goals and objectives, fundamental in the educational context to guide and support students and staff (Méndez 2018).

Continuous Improvement

It is a management approach that constantly seeks to improve processes, products and services through small, incremental and sustainable changes (Pérez 2019).

Qualitative Methods

They are research techniques that focus on understanding phenomena from a holistic and contextual perspective, using non-quantifiable data such as interviews and observations (Díaz 2017).

Motivation

It is the process that initiates, guides and maintains goal-oriented behaviors, crucial for educational success and personal development (Hernández 2016).

American Countries

Refers to the nations of the American continent, including North, Central, and South America, each with unique educational and social contexts (Álvarez 2015).

Teacher Perspective

It is the approach and vision that educators have about teaching and learning, influenced by their experiences, training, and context (Navarro 2020).

Strategic Planning

It is the process of defining the long-term direction and decisions of an educational organization, establishing objectives and

developing plans to achieve them (Morales 2018).

Educational Policies

It refers to the governmental and institutional guidelines and decisions that affect the organization, operation, and reform of the educational system (Ortiz 2021).

Postphotography

It is a concept that describes the evolution of photography in the digital age, where images are created, manipulated, and disseminated in new ways, altering the perception and use of images (Ruiz 2019).

Educational Practice

Refers to the actions and methods used by educators in the teaching and learning process, including pedagogy, didactics, and classroom management (García 2015).

Innovative Educational Practices

These are teaching methods and strategies that introduce new ideas and approaches to improve student learning and participation (Ramírez 2017).

Critical Cognitive Processes

Refers to the mental operations that allow individuals to analyze, evaluate, and synthesize information in a deep and reflective manner, essential for critical thinking (López 2018).

Knowledge Transfer Processes

It is the process by which knowledge and skills are transmitted from one context or individual to another, facilitating learning and innovation (Vega 2019).

Social Role

Refers to the expectations and responsibilities associated with a position or role in society, including those of educators, students, and other educational agents (Méndez 2018).

Teaching Situation

It is a specific environment or scenario designed to facilitate learning, where teaching activities and resources are organized (Fernández 2021).

Qualitative Techniques and Instruments

They are tools used in qualitative research to collect and analyze non-quantitative data, such as interviews, focus groups, and content analysis (Rodríguez 2017).

Decision Making

It is the process of selecting an option among several alternatives to solve problems or achieve objectives, crucial in educational management and leadership (Sánchez 2022).

Social Utility of Knowledge

It refers to the practical application of knowledge to improve society and solve community and global problems (Gómez 2016).

Linking

It is the process of connecting and collaborating with different actors and sectors to strengthen relationships and maximize mutual benefits, especially between educational institutions and the community (Méndez 2018).

Humanist Vision

It is an educational approach that values the integral development of the human being,

promoting respect, empathy and understanding of human diversity (Pérez 2019).

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