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An analysis of educational innovation culture by a Delphi expert panel

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This paper aims to reflect on educational innovation from the point of view of its representation as an indispensable element within the pedagogical culture of educational centers. We present the current elements that constitute the definition of educational innovation, its dimensions, obstacles, and determining factors that will delimit the institutionalization of the innovation process in education. To achieve this aim, we applied the Delphi technique and formulated questions whose answers were agreed upon in several iterations by 20 experts. The results have been organized into four categories that provide the backbone features of the visions, paradigms, opinions, and relevant pedagogical reflections on the concept of innovation, on the organization and participants in the process of innovation, on the pressures and resistance encountered during the process, and on the promotion and trends of educational innovation. We conclude that the definition of educational innovation requires a reflective yet critical and transformative component and that there is a close relationship between innovation and leadership in educational centers. We highlight the lack of time and weak training as the main factors limiting the implementation of reflective and transformative educational innovation processes. Finally, we highlight that promoting an educational innovation culture should be based on flexible research and evaluation processes that enable decision-making and favor pedagogical beliefs for change, together with continuous collaborative support.

KEYWORDS

educational innovation, pedagogic innovation, work culture, teaching practice, educational trend

Introduction

Educational innovation emerges as the mechanism through which educational processes must revolve around to generate or outline a new educational-curricular approach based on the development of the principles of transformation, transparency, efficiency, and improvement of competence-based education. Educational innovation

is key to improving equity and the quality of outcomes in all educational sectors [Organization for Economic Co-operation and Development (OECD, 2019)], and gives rise to actions that promote a change in mentality that stems from a model based on the needs and demands of real contexts to produce improvements in educational quality. Thus, the goal of educational systems is to prepare students to acquire global competences so they can successfully face the challenges of the twenty first century (Schleicher, 2018). As a result of this, individuals' development contexts are becoming increasingly complex and demanding, requiring more specialized knowledge. In other words, educational institutions must address the demands of society while fostering academic development that promotes the creation of knowledge, the ability to generate critical thinking, the development of spaces for reflection and scenarios to promote creative thinking, among others, in order to incorporate an educational innovation culture into the DNA of these institutions (Scardamalia and Bereiter, 2005). An enabling institutional environment can facilitate innovation in teaching staff and student academic performance (Hofman et al., 2002). The design and implementation of educational innovation policies are international trends that determine the future of students and their learning (Vincent-Lancrin et al., 2019).

Change should not be mistaken for innovation because not every change constitutes an innovation; changes can produce negative or counterproductive effects, or they can be fortuitous (García Gómez et al., 2019). Innovating involves moving from one situation to another by incorporating new elements or modifying existing ones in a deliberate, systematized, and planned manner. Innovation is usually understood as the introduction of something new and useful, such as new or modified methods, techniques, or practices (Mckeown, 2008). Cohen and Ball (2007, p. 19) define educational innovation as a “departure from current practice—deliberate or not, originating in or outside of practice, which is novel in educational policies, practices, curriculum design and implementation, assessment regimes, pedagogical technologies and resources, teacher capacities, etc.”. Innovation must have a design, a specific time frame with development phases, and an evaluation process that determines the degree of achievement of the changes applied (Hannan and Silver, 2005). Fullan (1992) demonstrated that the process of change consists of three overlapping phases: initiation, implementation, and institutionalization. Of the three phases, implementation is the most difficult to achieve; if innovation is difficult to conceive, it is even more difficult to put into practice, let alone institutionalize. Herodotou et al. (2019) proposed an integrated framework for selecting and identifying educational innovation experiences, which is composed of five elements: (a) relevance to effective educational theories in terms of the improvement of learning; (b) research on the effectiveness of the proposed pedagogies and their outcome; (c) relation to the development of twenty first century competences and the

2030 Agenda; (d) innovative or new aspects concerning the proposed pedagogy; and (e) the level of identification of gaps in educational knowledge and proposal of future lines of research.

Problematic situations have to be identified, analyzed in their contexts, and the changes that contribute to the improvement of educational education have to be evaluated critically to delimit the scope of innovation (Valenzuela-González, 2017). Educational innovation is defined as any organizational, administrative, or pedagogical adaptation that, in a critical and participatory manner, brings about changes in current educational practices and enhances or improves student learning (Carbonell Sebarroja, 2014; Gallardo-Córdova et al., 2017). It should be noted that not all institutions are equally exposed to educational innovation, due to organizational cultures, staff predisposition, or community involvement (Ortega Cuenca et al., 2007). Educational institutions also face a twofold challenge; not only do they have to create the right conditions to facilitate the creation of leadership that promotes innovation, but they also have to transform themselves to become more innovative in the structure of their organizational culture (Banerjee and Ceri, 2016).

Innovation culture is a polysemous term; it is one in which internal assumptions (i.e., values and management practices) encourage the development of new ideas in the form of products, processes, objects, and services (Jassawalla and Sashittal, 2002). Adamy and Heinecke (2005) argue that the organizational culture of schools is a key factor in influencing educational innovations. The success of any attempt at change depends largely on how issues of organizational culture are addressed (Keup et al., 2001). Therefore, to generate an educational innovation culture, it is necessary to modify and adapt it to the context where the culture is to be generated, taking into account the social dynamics, respect for diversity, and the values of the institution and the community. A series of dimensions that materialize in educational innovation plans should be brought together in order to apply the pedagogical philosophy proposed above and to attend to the creation process necessary to institutionalize an educational innovation culture (Suárez Téllez et al., 2010). The greatest challenge faced by many educational centers is to create a culture that supports, incentivizes, and welcomes educational innovation. The obstacles or factors that can hinder innovation are: (a) lack of a shared vision or strategy; (b) innovation that is not articulated as an organizational commitment; (c) segmentation; (d) hierarchical structures; (e) control of work; (f) risk aversion; (g) the exclusion of innovation in the performance evaluation process; and (h) the absence of reward and recognition programs (Buggie, 2001). In short, factors that can foster and support an educational innovation culture are leadership, commitment, strategy, structure, support mechanisms, trust, communication, training, evaluation, time, attitude, distributed network, etc. (Martins and Terblanche, 2003; Leavy, 2005; Vickers, 2006).

Materials and methods

Research questions

In a scenario in which innovation culture is becoming increasingly important in educational contexts, it is necessary to understand the features that define the innovation culture through the following questions: (a) what is understood by educational innovation; (b) how, and by whom, is it being carried out; (c) what threats and resistance does innovation encounter; and (d) how are these processes promoted?

Methodological strategy

The data presented in this study come from an R&D project entitled “NOMADIS: Nómadas del Conocimiento: Análisis de Prácticas Pedagógicas Disruptivas en Educación Secundaria” [NOMADIS: Nomads of Knowledge: An Analysis of Disruptive Pedagogical Practices in Secondary Education] (RTI2018-097144-B-I00), funded by the Spanish Ministry of Science, Innovation and Universities. This project focuses on disruptive pedagogical practices to identify their characteristics and better understand innovation processes. Although the project is developed in three phases, in this study we present the first phase, in which we have analyzed a group of experts' perceptions and representations of educational innovation. The Delphi technique has been used as it provides a way to structure the communicative process in a panel-group to shed light on a research problem (López Gómez, 2018), thus generating a consensus among experts (Okoli and Pawlowski, 2004). This is a technique of consulting a non-probabilistic sample of people with a good understanding of the subject under analysis (Orte et al., 2015). The iterative nature of the technique has been taken into account when implementing it, allowing participants to give their opinion on more than one occasion (Steurer, 2011). Thus, the process has been developed in two phases that allow controlled feedback, and all participants were aware of the general view of the group concerning the analyzed problem.

Another fundamental aspect of the use of the Delphi technique has to do with the validity and reliability of the research regarding the selection of participants. For this selection, the considerations of Grime and Wright (2016) were taken into account. The first consideration was anonymity; the participants did not know the identity of the others, so their opinions were not influenced. The second consideration was related to the heterogeneity factor; the group of experts consisted of 20 researchers who were geographically distributed across three different Spanish autonomous communities: Andalusia, Extremadura, and Castile and Leon. This adheres to the methodological guidelines that advise that the group should consist of a minimum

of seven and a maximum of 30 components (Orte et al., 2015). Regarding the profile of the experts, we gathered a group with a broad professional background linked to educational innovation in different contexts and areas of specialization. Another feature denoting the heterogeneity of the group was gender, with 10 women and 10 men making up the group. Table 1 shows the profile of the participating experts.

Concerning ethical considerations, an informed consent form was distributed among the participants at the beginning of the study, explaining the objectives of the study, the degree of involvement required, confidentiality, and anonymity, as well as the possibility to leave the research study at any time.

After selecting the key experts and forming the panel, the two-round Delphi technique was initiated. The first phase involved the construction, validation, and application of Questionnaire 1. The second phase involved the construction, validation, and application of Questionnaire 2, which was based on the data obtained in the first phase. Eight researchers from the previously mentioned R&D project elaborated and validated both questionnaires through a revision process. Both questionnaires are structured around four topics that were defined based on a literature review: (a) the educational institution; (b) learning in non-formal contexts; (c) educational innovation and innovation culture; and (d) technological mediation. In this study, we present the findings on the educational innovation topic (c). In the first questionnaire, this topic is composed of five open-ended questions that were analyzed using a content analysis methodology through a process of coding and categorization (see Table 2).

To take into account the iterative nature of this technique, the consensus and disagreement in the answers to the questions in the Delphi Questionnaire 1 were identified and Questionnaire 2 (see Table 3) was elaborated based on those answers (Valverde Berrococo, 2021). Ten dimensions corresponded to this topic and between four and eight items were associated with each dimension, which the participants had to order according to their relevance. These items come from the analysis of the data from Questionnaire 1. For the analysis, the percentage of mentions obtained by each option within an item and the percentage of weighted value were used to obtain the final classification.

Results

The main results of the Delphi technique concerning educational innovation and innovation culture are presented below. The results, part of the research reports (Equipo de investigación Ceaex-Uva, 2021; Valverde Berrococo, 2021), were divided into four categories that answer the research questions. Table 4 shows each category and its association with the items

TABLE 1 Profile of the participating experts.

Dimensions	Features
Profile	Secondary education teachers, management teams, advisors, and educational managers.
Areas of knowledge involved	Mathematics, natural sciences, humanities, technology, physical education, economics, and pedagogy.
Recognition of their innovative practices	Active and collaborative methodologies, integration of digital technologies, and participation in teaching networks for pedagogical renewal and educational change.

TABLE 2 Selection of questions from educational innovation and innovation culture, topic (c) of the first phase, Questionnaire 1.

Question no.	Questions
9	What do you understand by educational innovation? How do you think people innovate? Why do you think people innovate?
10	What role does innovation play in your center? How does your center innovate? Why does your center innovate?
11	Do you think innovation should be encouraged? What conditions should educational centers guarantee to encourage the development of innovation processes? What hinders these processes?
12	Do you think the way of innovating has changed in recent years? If you think there have been changes, what or who do you think is promoting these changes?
13	What elements do you think characterize this innovation culture?

that received the highest scores from the experts. After this first approximation of the study data, we will describe the results linked to each of the categories in detail.

Educational innovation concept, current definition, and objectives

The first category refers to the experts' view of educational innovation from a retrospective approach to the present time. It also alludes to the goals present in any process of educational renewal and change, i.e., from whom it starts, what didactic tools should be used to implement it, and what factors guarantee its viability and sustainability.

In second place is the idea that innovation is related to attending to the interests and needs of students and to creating motivating pedagogical approaches for teachers, followed by the idea that innovation originates from small teams of teachers and not from teaching staff.

As can be seen in [Table 5](#), the definition of innovation that received the highest rating is the one that incorporates the ideas of reflection, criticism, and change: "Innovation is a continuous process of revision and improvement of the established educational paradigm, a process in which we question what we do and how we do it, which requires changes and adaptations in many diverse fields."

In sixth place is the idea that the use of digital technologies alone does not constitute an innovative action and emphasizes their instrumental role as a tool and not as the action itself: "The use of technologies is not innovation; technologies are only a tool."

In seventh place is the idea that innovation is an individual attitude that originates from dissatisfaction with one's teaching practice and from the desire for educational improvement. In

sixth place is the idea that the use of digital technologies alone does not constitute an innovative action and emphasizes their instrumental role as a tool and not as the action itself: "The use of technologies is not innovation; technologies are only a tool."

In last place is the concept that innovation involves the use of non-traditional methods and resources to respond to educational phenomena.

Even so, the current opinion on what defines educational innovation, as can be seen in [Table 6](#), includes the use of digital technologies, followed by educational innovation's "link with an inclusive school." In third place, we see the idea of the teacher as a reflective professional in their practice. In last place are the influences of business practices on innovation models in the classroom. In sixth place is the use of networks in the formation of learning communities, and in fifth place is "clarity in the definition of educational purposes."

If we look at [Table 7](#), the main purpose of educational innovation, in the opinion of the experts consulted, is to act as an endorsement that ensures the full development of competences by students: "The purpose of educational innovation is to ensure that students can develop their potentialities, skills, and abilities." In second place is innovation's objective to continuously improve in the face of a classroom reality that does not seem to be satisfactory: "Educational innovation involves changing something that does not work; it should not seek to change for the sake of change but should respond to a need for change." In third place is innovation's objective to achieve didactic strategies that promote learning. Finally, there are two factors involved in innovation; on the one hand, the pedagogical autonomy of centers and, on the other, the means to innovate. The opinion that innovation is a social process is also taken into consideration: "Innovation is achieved through collaborative processes that improve socialization and coexistence."

TABLE 3 Selection of questions from educational innovation and innovation culture, topic (c) of the second phase, Questionnaire 2.

Question no.	Questions	No. of items
20	Ideas on the concept of educational innovation	8
21	Objectives of educational innovation	7
22	External pressures affecting educational innovation	4
23	Involvement of teachers in innovation processes	7
24	Promoting educational innovation	8
25	Relationship between innovation and organization of the center	8
26	Resistance to educational innovation	8
27	Promotion of educational innovation	7
28	Trends in educational innovation	8
29	How is currently defined educational innovation	7

School organization and teachers' participation in innovation processes

The second category is dedicated to analyzing the impact of school organization on educational innovation, how the leadership style of school management facilitates the creation of a favorable atmosphere and structure, and how resources, attitudes, and training can determine the processes of change and pedagogical renewal.

As can be seen in [Table 8](#), according to the experts consulted, in first place is the relationship between innovation and the organization of the center. Horizontal leadership provides the context for transformation based on agreement: "The management team must exercise democratic leadership that offers opportunities for innovation, generating an atmosphere of trust and collegiality." In second place is the importance of the participation of all members of the school community and its relationship with other centers. In third place is the importance of the systematic evaluation required for implementing innovation processes: "Evaluation must be a key element in the innovation process, allowing us to discover whether or not it has been effective." In last place is the experts' opinion that planning and time management are decisive variables to innovate: "Time management is a fundamental factor for innovation." In fourth place is the importance of renewing the forms of communication within schools and in fifth place is the need to transform the way the school is organized and to enjoy greater autonomy.

Furthermore, as can be seen in the data presented in [Table 9](#), the experts detected a critical element in teachers who participate in educational innovation: "A certain lack of preparation is perceived in the face of innovation processes." In second place is the opinion that innovation implies a transformation of teaching-learning methods, and in third place is the opinion that innovation is a process that emerges from the leadership of the educational institution's

management team itself. The fifth place is occupied by the idea that innovation is a bottom-up process that arises from training or institutional projects. In sixth place is the opinion on the type of school leadership needed to sustain the proposals of its teachers, both from an organizational and academic level. In last place is the idea that conflict may be perceived between school management and teaching staff with diverse interests and expectations: "Innovation in the center means a battle between the management team and a diverse teaching staff with different levels of motivation."

External pressures and resistance affecting educational innovation

The third category of analysis deals with factors that impede the development of innovation processes in the classroom. [Table 10](#) shows that the most important external pressure, according to the experts, is that innovation depends on and originates from external factors: "One innovates for social recognition or to receive administrative or economic rewards." In second place is the influence derived from the school and its contextual characteristics: "Educational innovation should come from the educational institution itself, from the school itself, according to its needs and should be linked to the entire school instead of coming from government authorities."

In last place is the concept of innovation, linked to the context of educational policy through its norms. In third place is innovation's link with the introduction of teaching methods that already exist but which acquire new prominence and are adopted as original.

Even so, as can be seen in [Table 11](#), the most important resistance to educational innovation that experts point out is: "Lack of time, work overload, organization of

TABLE 4 Items rated with the highest priority for each question on educational innovation and innovation culture.

Category	Item	Percentage of weighted value	Maximum value
1. Educational innovation concept, current definition, and objectives.	1.1. Innovation is a continuous process of revision and improvement of the established educational paradigm, a process that questions what we do and how we do it, and the result of constant reflection, which requires changes and adaptations in many diverse fields.	626.32	800.00
	1.2. Use of digital technologies.	521.05	700.00
	1.3 The purpose of educational innovation is to ensure that students can develop their potentialities, abilities, and skills.	521.05	700.00
2. School organization and teacher participation in innovation processes.	2.1. The management team must exercise democratic leadership that offers opportunities for innovation, generating an atmosphere of trust and collegiality.	673.68	800.00
	2.2. There is a certain lack of preparation for innovation processes.	521.05	700.00
3. External pressures and resistance that innovation encounters.	3.1 Innovation is carried out for social recognition or administrative or economic rewards.	321.05	400.00
	3.2. Lack of time, work overload, organization of fixed schedules, routines, and rituals.	631.58	800.00
4. Encouragement, promotion, and trends in educational innovation.	4.1. Innovation should be encouraged because it is necessary to adapt educational processes to changing contexts, emerging values, neuroscientific discoveries, and labor and citizenship needs.	642.11	800.00
	4.2. Innovation is mainly promoted by teaching staff, motivated by students who demand more attractive teaching.	610.53	700.00
	4.3. Innovation cannot be understood without research.	584.21	800.00

TABLE 5 Ideas on the concept of educational innovation, from highest to lowest priority.

	Revision and improvement	Improved learning	Group of teachers	Basis of education	Use of technologies	Technologies as tools	Individual attitude	Unusual methodologies
1	36.84	21.05	0.00	5.26	5.26	21.05	15.79	5.26
2	26.32	26.32	15.79	5.26	10.53	10.53	15.79	0.00
3	15.79	5.26	26.32	26.32	21.05	0.00	0.00	10.53
4	0.00	10.53	26.32	26.32	21.05	5.26	0.00	10.53
5	5.26	0.00	10.53	5.26	15.79	10.53	15.79	26.32
6	5.26	5.26	0.00	10.53	5.26	15.79	15.79	31.58
7	5.26	15.79	5.26	21.05	15.79	10.53	10.53	15.79
8	5.26	15.79	15.79	0.00	5.26	26.32	26.32	0.00
Total	100	100	100	100	100	100	100	100
% of weighted value	626.32	500.00	468.42	463.16	463.16	405.26	394.74	389.47

1 = Highest priority/8 = Lowest priority.

fixed schedules, routines, and rituals.” In second place is for curricular rigidity and traditional evaluation: “The organization by disciplines and closed evaluation methods (exams).” In third place is the teaching staff’s resistance to change, and in last place is the lack of economic resources, materials, space, and infrastructure. In sixth place is the idea that there are deficits in this area in initial teacher training, and in seventh place is the teaching staff’s limited creativity. Furthermore, external threats to innovation come from constantly changing educational laws, administrative

procedures, and families’ mistrust of the pedagogical changes introduced.

Encouragement, promotion, and trends in educational innovation

Once the genesis, goals, characteristics of, and barriers to educational innovation have been analyzed, the fourth category focuses on presenting the

TABLE 6 Opinions on what is currently defined as educational innovation, from highest to lowest priority.

	ICT use	Inclusive school	Reflection on teaching practice	Learning effectiveness	Educational purposes	Virtual faculty meetings	Business model
1	26.32	21.05	21.05	15.79	5.26	0.00	10.53
2	21.05	42.11	21.05	5.26	0.00	10.53	0.00
3	36.84	0.00	21.05	5.26	15.79	15.79	5.26
4	0.00	15.79	5.26	36.84	15.79	15.79	10.53
5	0.00	0.00	5.26	31.58	36.84	10.53	15.79
6	10.53	5.26	26.32	5.26	10.53	26.32	15.79
7	5.26	15.79	0.00	0.00	15.79	21.05	42.11
Total	100	100	100	100	100	100	100
% of weighted value	521.05	489.47	468.42	421.05	326.32	310.53	263.16

1 = Highest priority/7 = Lowest priority.

TABLE 7 Opinions on the objectives of educational innovation, from highest to lowest priority.

	Development of potentialities	Need for change	Connection with students	Educational equity	Transformative practices	Collaborative processes	Availability and freedom
1	31.58	26.32	10.53	10.53	15.79	0.00	5.26
2	26.32	15.79	26.32	21.05	5.26	0.00	5.26
3	21.05	21.05	10.53	5.26	21.05	5.26	15.79
4	0.00	10.53	15.79	15.79	5.26	42.11	10.53
5	0.00	10.53	15.79	15.79	15.79	31.58	10.53
6	15.79	5.26	10.53	21.05	15.79	15.79	15.79
7	5.26	10.53	10.53	10.53	21.05	5.26	36.84
Total	100	100	100	100	100	100	100
% of weighted value	521.05	478.95	426.32	389.47	368.42	326.32	289.47

1 = Highest priority/7 = Lowest priority.

TABLE 8 Opinions on the relationship between innovation and organization of the center, from highest to lowest priority.

	Democratic leadership	Involvement of the educational community	Evaluation	Communi- cative processes	Organiza- tional model	Training as accompani- ment	Volun- teerism	Time management
1	47.37	21.05	10.53	5.26	21.05	10.53	5.26	5.26
2	21.05	36.84	21.05	0.00	0.00	5.26	5.26	0.00
3	15.79	10.53	31.58	31.58	5.26	5.26	21.05	21.05
4	5.26	5.26	21.05	26.32	15.79	15.79	5.26	5.26
5	5.26	15.79	10.53	21.05	10.53	26.32	5.26	15.79
6	0.00	5.26	0.00	10.53	15.79	10.53	21.05	15.79
7	0.00	5.26	5.26	5.26	15.79	15.79	15.79	10.53
8	5.26	0.00	0.00	0.00	15.79	10.53	21.05	26.32
Total	100	100	100	100	100	100	100	100
% of weighted value	673.68	605.26	578.95	489.47	415.79	410.53	368.42	352.63

1 = Highest priority/8 = Lowest priority.

analysis of results on how educational innovation is implemented and what is its most avant-garde vision or prospective.

As can be seen in Table 12, the main and most important argument in favor of educational innovation is the need to adapt to social, ethical, scientific, and economic changes. In second

TABLE 9 Opinions on teacher participation in innovation processes, from highest to lowest priority.

	Lack of preparation	Training for methodological change	Originates in the management team	Failure of superficial innovation	Personal or group initiatives	Need for motivational leadership	Battle between management team and teachers
1	31.58	26.32	10.53	10.53	15.79	0.00	5.26
2	26.32	15.79	26.32	21.05	5.26	0.00	5.26
3	21.05	21.05	10.53	5.26	21.05	5.26	15.79
4	0.00	10.53	15.79	15.79	5.26	42.11	10.53
5	0.00	10.53	15.79	15.79	15.79	31.58	10.53
6	15.79	5.26	10.53	21.05	15.79	15.79	15.79
7	5.26	10.53	10.53	10.53	21.05	5.26	36.84
Total	100	100	100	100	100	100	100
% of weighted value	521.05	478.95	426.32	389.47	368.42	326.32	289.47

1 = Highest priority/7 = Lowest priority.

TABLE 10 Opinions on external pressures affecting educational innovation, from highest to lowest priority.

	Recognition	Origin in the center	Methodological recycling	Trends based on laws
1	63.16	5.26	21.05	10.53
2	5.26	52.63	31.58	10.53
3	21.05	31.58	15.79	31.58
4	10.53	10.53	31.58	47.37
Total	100	100	100	100
% of weighted value	321.05	252.63	242.11	184.21

1 = Highest priority/4 = Lowest priority.

TABLE 11 Opinions on resistance to educational innovation, from highest to lowest priority.

	Lack of time	Disciplines and evaluation	Teachers	Bureaucracy and families	Teachers' self-confidence	Initial training	Creativity	Funding
1	42.11	26.32	0.00	5.26	10.53	10.53	5.26	0.00
2	21.05	26.32	26.32	5.26	15.79	5.26	0.00	0.00
3	10.53	15.79	15.79	26.32	5.26	15.79	5.26	5.26
4	5.26	10.53	21.05	15.79	10.53	15.79	5.26	15.79
5	5.26	15.79	10.53	15.79	15.79	5.26	21.05	10.53
6	10.53	0.00	5.26	10.53	21.05	10.53	21.05	21.05
7	0.00	5.26	15.79	10.53	15.79	26.32	21.05	5.26
8	5.26	0.00	5.26	10.53	5.26	10.53	21.05	42.11
Total	100	100	100	100	100	100	100	100
% of weighted value	631.58	615.79	478.95	442.11	442.11	410.53	310.53	268.42

1 = Highest priority/8 = Lowest priority.

place is the search for quality for all students: “To adapt the school to the social context and achieve equality in the quality of education for all students.” In third place is the problem of considering innovation as an end in itself, which leads to its trivialization and to innovation without an educational sense or goal. In last place is the experts’ opinion that the promotion of innovation must be linked to the promotion of the introduction of digital technologies in the educational process.

The main promoter of educational innovation, according to the results presented in Table 13, is teaching staff who feel challenged by the students’ demand for more motivating learning experiences: “Innovation is mainly promoted by the teaching staff, motivated by the students who demand more attractive teaching.” In second place is the idea that innovation originates from multiple agents: teaching staff, students, families, and, on the other hand, teachers’ centers,

TABLE 12 Opinions on the promotion of educational innovation, from highest to lowest priority.

	Change in values, neuroscience, and labor market	Adaptation and quality	Innovation as an end in itself	Support and exchange	Problem detection	Transparency	Motivation and renewal	Incorporation of technology
1	36.84	31.58	15.79	26.32	15.79	0.00	0.00	0.00
2	21.05	26.32	10.53	10.53	21.05	5.26	5.26	0.00
3	21.05	15.79	15.79	15.79	10.53	31.58	26.32	0.00
4	5.26	10.53	26.32	10.53	10.53	21.05	15.79	26.32
5	5.26	5.26	10.53	5.26	10.53	10.53	15.79	10.53
6	5.26	0.00	10.53	15.79	10.53	21.05	10.53	26.32
7	5.26	0.00	10.53	5.26	10.53	0.00	10.53	26.32
8	0.00	10.53	0.00	10.53	10.53	10.53	15.79	10.53
Total	100	100	100	100	100	100	100	100
% of weighted value	642.11	615.79	521.05	521.05	494.74	447.37	405.26	315.79

1 = Highest priority/8 = Lowest priority.

TABLE 13 Opinions on the promotion of educational innovation, from highest to lowest priority.

	Student demands	Various agents	Educational inspection	Socio-technological changes	Social networks	Commodification	Education legislation
1	57.89	10.53	5.26	15.79	5.26	5.26	0.00
2	10.53	31.58	21.05	10.53	15.79	5.26	5.26
3	21.05	15.79	21.05	5.26	10.53	5.26	21.05
4	5.26	5.26	26.32	21.05	10.53	21.05	10.53
5	5.26	10.53	5.26	15.79	21.05	21.05	21.05
6	0.00	10.53	5.26	15.79	21.05	31.58	15.79
7	0.00	15.79	15.79	15.79	15.79	10.53	26.32
Total	100	100	100	100	100	100	100
% of weighted value	610.53	431.58	415.79	378.95	347.37	315.79	

1 = Highest priority/7 = Lowest priority.

TABLE 14 Opinions on trends in educational innovation, from highest to lowest priority.

	Research	Collaborative work	Cooperative learning	Training for change	Involvement	Multiple intelligences	Supervision
1	36.84	21.05	15.79	5.26	5.26	5.26	5.26
2	21.05	26.32	5.26	26.32	5.26	0.00	10.53
3	5.26	10.53	26.32	5.26	15.79	15.79	15.79
4	5.26	5.26	31.58	10.53	21.05	21.05	5.26
5	10.53	26.32	5.26	10.53	15.79	15.79	10.53
6	5.26	10.53	10.53	15.79	15.79	21.05	15.79
7	10.53	0.00	0.00	26.32	10.53	5.26	21.05
8	5.26	0.00	5.26	0.00	10.53	15.79	15.79
Total	100	100	100	100	100	100	100
% of weighted value	584.21	578.95	536.84	452.63	421.05	394.74	384.21

1 = Highest priority/7 = Lowest priority.

resources, and educational inspection. In third place is the opinion that educational inspection does not play a role in promoting educational innovation. In fourth place is the idea

that innovation has an external origin determined by sociology and engineering. In sixth place is the vision of innovation promoted by the economic interests of companies in the

educational sector. In fifth place is the idea that promotion is encouraged by the Internet's new communication channels. Finally, in last place is education legislation as a promoter of innovation.

Table 14 shows the latest results referring to trends in educational innovation in the opinion of the experts. In first place, attention is given to the close link between innovation and research, given that “innovation is not understood without research.” In second place is the idea of cooperation, teamwork, and a bottom-up vision. In third place is the relevance of peer learning and “interest in the development of cooperative learning.” In fourth place is the perception that teachers demand training that prepares them for pedagogical renewal, and in fifth place is the idea that innovation is a process that involves the whole center, not just the teacher or teachers who innovate. Lastly, there is the endorsement that scientific production provides the basis and meaning of educational innovation.

Discussion and conclusion

For years, the concept of innovation has been one of the most widespread and valued concepts in both established and emerging lines of research, despite at times being a vague concept. In the research carried out and reflected in this article, innovation is considered a highly relevant concept that frames paradigms related to the exposure of reflective ideas, criticism, and possibilities for change or transformation (Collazo Expósito and Geli de Ciurana, 2022). Innovation is considered the catalyzing and enabling process of a change or adaptation that substantially improves educational processes. In this sense, innovation is present in the social and pedagogical demands that emerge in educational contexts, giving rise to new models that take into account these demands and adhere to the needs of both citizens and institutions that shape the socioeconomic landscape (Álvarez, 2015).

Also, the model of design thinking can contribute to improve teacher commitment aimed at educational change. This model provides a structure to the innovation process that can be able to help teacher collaborate and to agree on the outcome at each stage through participation, dialogue, an collaborative learning (Liedtka, 2018).

Nowadays, most teaching staff considers that innovation involves the inclusion of some technological element; sometimes, these elements are used as tools and do not provide any real innovation (Knox, 2021). As the experts indicate, such innovation does not only involve the use of tools, but the main pillar of this innovation should be linked to updating and improving the methodologies used in the classroom, making them more inclusive and, in turn, more relevant to current demands and needs. Hence, teaching staff must adapt and update both their processes and the materials used in conjunction with the advances that are taking place

(Sancho and Alonso, 2012; San Martín Alonso et al., 2014; Sancho, 2018).

When it comes to implementing educational innovation processes, two quite polarized organizational trends can be observed. On the one hand, there are initiatives that are put in place by the government and are therefore imposed from above with the impetus of management teams. On the other hand, there is a more individualistic model that arises from the initiative of individual teachers, who drive innovation from the bottom up. This polarization is also referred to in a study by Pascual Medina and Navío-Gàmez (2018), where they argue that there is a need for innovation to come from educational centers and not from ministerial programs. In these educational centers, it should be a commitment of all or a large part of the teaching staff. Indeed, when innovation is imposed from above, according to Astudillo and Imbarack (2013), there is a process of assimilation and accommodation to the reality of the school by teachers that can be carried out in four different ways: (a) fusion, when the new cohabits with the old without integration; (b) compartmentalization, when it is limited to some specific aspects of the educational project, eliminating its comprehensive nature; (c) enrichment, when some areas of the project are integrated by improving the tasks that already exist; and (d) restructuring, when the innovation project changes the structure of what is to be improved. The last two processes are desirable because the first two are usually assumed without criticism or reflection by the teaching staff. However, scientific evidence has shown that educational innovation processes carried out in schools tend to be isolated and short-lived. For Pascual Medina and Navío-Gàmez (2018), innovation rarely arises from a collective. Instead, it usually comes from the idea of individual teachers and generates resistance from people at the time of institutionalization. This resistance should be used to generate reflection and criticism and to adapt the innovation initiative to the context in the best possible way.

Once again, emphasis is placed on the need for collective reflection and involvement (Gairín and Rodríguez-Gómez, 2011). In this sense, Beraún (2011) and Said-Hung et al. (2017) recognize the important role played not only by teachers' leadership but also by management teams and governments themselves. Innovative initiatives must be driven by management teams that exercise democratic leadership capable of generating an atmosphere of trust and collegiality, promoting joint work by the entire educational community, and linking innovation with the environment and other educational centers (Thoonen et al., 2012). There is a proven link between educational innovation and school leadership; the development of a distributed leadership, the availability of sufficient material and human resources, the adequate organization of these resources, the school culture, and the context are conditions that can either favor or hinder educational innovation (Leal-Soto et al., 2016; Parejo and Giraldez-Hayes, 2021). Innovation culture is favored by leadership that reinforces it, but this

leadership must be agile and adaptable. It must constantly learn and be open to experimentation and diverse viewpoints. It must establish clear and coherent innovation objectives and encourage both internal and external collaboration and change in evaluation and recognition systems (Kanter, 1988).

In the present study, these two ways of proceeding are observed, linked to the technical or reflective practical paradigms of educational innovation described by Pascual Medina and Navío-Gàmez (2018), based in turn on Escudero (2014). It would be desirable to reach a critical paradigm in which change is generated by teachers collectively with the rest of actors and where change is oriented toward emancipation, inclusion, social justice, and democracy (Murillo, 2021). In this sense, Zhu and Engels (2014) focus on the importance of organizational culture for the implementation of innovation. Thus, understanding the culture will be decisive in the transformation processes to prepare the environment and achieve the desired results in the innovation processes. It is necessary, as these authors point out, to overcome obstacles such as the lack of a shared and strategic vision of innovation by advocating for horizontal commitment and abandoning hierarchical structures.

Moreover, the strengthening of innovation does not only require a restructuring of institutions, but also a new culture in which teaching staff questions their beliefs and habits and reviews their old and new conceptions of teaching and learning in-depth (Fullan, 2007), and where collective criticism is the basis for the design, implementation, adaptation, and even institutionalization of innovation. Black and Gregersen (2002) argue that in the process of educational change, one must first conceive, then believe, and finally achieve the process of educational change. The pedagogical views and beliefs of teaching staff play a key role in determining whether educational innovations are adopted (Zhu et al., 2010). Such a complex scenario makes teachers reflect on their pedagogical praxis, as well as on whether the innovation they implement is useful for their students (García-Peñalvo, 2015). Hence, teachers demand that educational innovation processes ensure the full development of students' competences (Tourrián López, 2020). Although innovations allow processes to be improved, these innovation processes must be constant and subject to review, evaluation, criticism, and, ultimately, improvement (Trujillo Sáez et al., 2020; Palacios Núñez et al., 2021). This constant improvement will allow processes to be strengthened and systematized, taking them from anecdotal to habitual.

This more horizontal organizational model can be achieved through the activation of collaborative research models because, as pointed out in the present study, innovation cannot be separated from evaluation. Innovation projects need to be accompanied by an analysis of the practices—their strengths and weaknesses. Teachers should be involved

in research processes about these teaching practices, giving them the opportunity to analyze said practices. Fundamentally, academic research should be a systematic process of reflection and criticism that is not straitjacketed in the rigidity of traditional criteria (Reis-Jorge et al., 2019). Undoubtedly, this would minimize the formative gaps that, concerning innovation, seem to be recognized by the expert participants of this research. Training connected to reality would be developed, which would allow a greater understanding of the processes through research and continuous reflection processes.

Innovation processes, which should result in effective change in classrooms, are recognized as complex processes due to the scarcity of means to confront this transformation and the lack of time to update knowledge (Aguilar-Forero and Cifuentes, 2020). Pascual Medina and Navío-Gàmez (2018) point out constant update and improvement, in addition to observation and empathy skills, as personal characteristics that an innovative teacher must have. The organization by disciplines and closed evaluation methods often hinder educational innovation processes because they generate closed structures where flexibility and creativity are difficult, as they are seen by teaching staff as initiatives imposed from above or simply as educational games (Tuhkala, 2021). There is also a lack of funding and resources that hinders the development of initiatives, in addition to the constant administrative procedures associated with these processes. Another factor that hinders the implementation of these initiatives is the attitude of families, who are sometimes resistant to change (Castillo et al., 2014; Pericacho, 2016).

In view of these difficulties, it is possible to point out some factors—linked to the continuous training and support of teachers—that can facilitate innovation (García-Gómez and Salas-Martínez, 2021), besides the possibility of sharing and disseminating projects among the entire educational community. For innovation to be truly useful, it is necessary to provide tools, networks, and spaces for teachers at all levels to capture their experiences and share them, avoiding experiences that remain hidden in anecdotal practices with little use and impact. In the responses obtained, we can see that it is necessary to create an educational innovation culture, and also to transfer results to make the different initiatives visible among the educational community and motivate both the creation of experiences and the replication of existing ones (Ortiz-Morales, 2019).

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

AO-F organized the methodology. F-IR-D and JG-A performed the qualitative analysis. J-LP wrote the first draft of the manuscript. F-IR-D, JG-A, and AO-F wrote sections of the manuscript. All authors contributed to conception and design of the study and manuscript revision and read and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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