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RESPONSIBILITY IN SCHOOL INNOVATION THROUGH A RESEARCH-BASED MANAGEMENT STRATEGY

Responsabilitatea în inovarea școlară printr-o strategie de management
bazată pe cercetare

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RESPONSIBILITY IN SCHOOL INNOVATION THROUGH A RESEARCH-BASED MANAGEMENT STRATEGY

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Abstract

European and national policies aimed at the development and modernization of education systems promote innovation across all their components. In response to these requirements, managers of educational institutions in Romania have made, and continue to make, efforts to align their missions with the demands of contemporary society, where digitalization and internationalization represent major challenges.

This study aims to diagnose the process of innovation in education by addressing several key research questions: How is innovation understood within the management of educational institutions? How has the innovation process been implemented, what factors support it, and what challenges does it face? What solutions could enhance the effectiveness of innovative measures in schools?

The study, conducted through a questionnaire containing both closed-ended questions (with predefined or Likert-scale response options) and open-ended questions, gathered the opinions of 46 teachers holding management positions in schools (principals, deputy principals, and board members) from the South-East region of Romania, which was selected for practical and logistical reasons.

The qualitative and quantitative analysis of the collected data yielded several important findings regarding the effectiveness of the innovation process in education. Innovation represents an important dimension of institutional management, and teachers are generally receptive to innovative practices, with most of them participating in continuous professional development in this area. However, not all schools have a coherent strategy for innovation in the educational

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process based on a clear and objective analysis of the school's context, available resources, and opportunities for change.

Keywords: educational research, responsible innovation, school management, strategy of innovation.

Rezumat

Politicile europene și naționale privind dezvoltarea și modernizarea sistemelor de învățământ promovează inovarea în toate componentele acestora. Ca răspuns la aceste cerințe, managerii instituțiilor de învățământ din România au depus și continuă să depună eforturi pentru alinierea misiunii instituționale la exigențele societății contemporane, în care digitalizarea și internaționalizarea reprezintă provocări majore.

În cadrul acestui studiu ne propunem să analizăm procesul de inovare în educație, pornind de la următoarele întrebări de cercetare: Cum este înțeleasă inovația la nivelul managementului instituțiilor de învățământ? Cum s-a desfășurat procesul de inovare, care sunt factorii care îl susțin și dificultățile cu care se confruntă? Ce soluții ar putea contribui la eficientizarea măsurilor inovatoare implementate în școală?

Cercetarea, realizată prin intermediul unui chestionar care include atât întrebări închise, cu răspunsuri predefinite sau de tip Likert, cât și întrebări deschise, prezintă opiniile a 46 de cadre didactice cu atribuții de management școlar (directori, directori adjuncți și membri ai consiliilor de administrație) din regiunea de Sud-Est a României, selectată din considerente practice și logistice.

Analiza calitativă și cantitativă a datelor colectate a evidențiat rezultate importante privind eficiența procesului de inovare în educație. Acesta constituie o dimensiune importantă a managementului instituțional, iar cadrele didactice manifestă receptivitate față de schimbare, majoritatea beneficiind de formare continuă în acest domeniu. Totuși, nu toate școlile au o strategie coerentă de inovare a procesului educațional, fundamentată pe o analiză clară și obiectivă a realității școlare, a resurselor disponibile și a oportunităților de schimbare.

Cuvinte-cheie: cercetare educațională, inovare responsabilă, management școlar, strategie de inovare.

1. Introduction

Innovation in the education process is not an option. It is becoming a necessity in the context of accelerated changes at all levels of society, because in a competitive market with a globalized economy, innovation is the soul of competitiveness (Mihai & Țițan, 2014). For schools, as institutions responsible for formal education, innovation represents a priority. Policies at European and national level set clear directions in this regard. Thus, the European Parliament Resolution on the modernization of education in the EU states that “the changing educational reality and related challenges underline the potential offered by new information and communication technologies (ICT) and innovation as tools that offer new opportunities in the field of education, responding more effectively to the individual needs of learners (including special learning needs), increasing flexibility in learning and teaching processes, personalization and responsibility, as well as promoting interactive forms of cooperation and communication” (European Parliament, 2018, p. 12).

Research and innovation, both conditions and effects of quality education, are relevant and beneficial aspects for a society in which knowledge represents “a fundamental economic resource and a source of citizens’ well-being” (p. 12). Thus, the European Commission and the Member States are called upon to support teachers to incorporate innovation and technology into teaching by strengthening their digital skills, by providing more in-service training and by developing online communities and open-access educational resources and courses. In this context, Romania must face the challenges of the modern world – a global, competitive and technological world, in which innovation and technological evolution take place at an increasingly rapid pace, a world in which the ability to adapt quickly – for individuals and society alike – makes all the difference (Administrația Prezidențială, 2021, p. 4). For this reason, quality education is needed, the benefits of which at a societal level have materialized in “economic development, global competitiveness, innovation, social cohesion, increased civic involvement” (Administrația Prezidențială, 2021, p. 5). Modernizing the school for the 21st century takes more than curricular reform; it takes systemic transformations across every dimension of the school. The focus will be placed on a key factor: the quality of teachers’ professional development, which constitutes a prerequisite for all other educational changes (Javrha & Kalina, 2010).

The broad country project contains “twelve desiderata for an educated Romania, on the horizon of 2030”, including “a professionalized and innovation-based educational management” (Administrația Prezidențială, 2021, p. 14), which will ensure the efficient functioning of a modern education system. This professional educational management can “implement, monitor and provide feedback to public policies in education, in all educational units” (p. 14). The research highlights the fundamental role that managers of educational institutions have in realizing the innovation process in education, because school reform and modernization require the emergence of a collective will (at the institutional and social level) that desires and supports these processes. They have to have transparent and concrete goals, which are vitally linked to the local environment and other partners (Javrha & Kalina, 2010).

As part of the national strategy outlined in the Educated Romania (*România educată*) project, the professionalization of educational management and the establishment of governance are grounded in the principles of “integrity, quality and equity”. This involves “the creation of initial and continuous training programs for education managers, their selection through competition and the separation of the economic-administrative management of schools from the educational one” (Administrația Prezidențială, 2021, p. 16).

2. Conceptual background

Starting from the basic term “innovation”, which generally refers to the introduction of change, educational innovation refers to the process of transforming educational institutions (schools, universities, etc.), which must evolve and adapt in order to fulfil their main mission: preparing pupils and students for a complex, interconnected world characterized by rapid technical, cultural, economic, and demographic changes (European Commission, 2023). Innovation in education is closely linked to the development of digital technology. While many would argue that much good comes from this process, there is increasing recognition of the risks and downsides of innovation (Greenfield, 2017, Lanier, 2010, as cited in Bates et al., 2019). Thus, innovation in education is often perceived as being synonymous with the introduction of digital technology “pursuing newness at all costs, as

production for its own sake without reflecting on the wider consequences” (Bates et al., 2019, p. 2). This fact led to “responsible innovation”, defined as “taking care of the future through collective stewardship of science and innovation in the present” (Owen et al., 2013). According to the same authors, “science and innovation have not only produced understanding, knowledge, and value (economic, social, or otherwise), but also questions, dilemmas, and unintended impacts”. Responsible innovation highlights four key components, namely anticipation, reflexivity, inclusion, and responsiveness (Stilgoe et al., 2013) and can be genuinely transformative and constructive, “an alternative lens that can be used to increase the positive impact of technological solutions and reduce the risk of unintended consequences challenging the success of the innovation in the future” (Bates et al., 2019, p. 3).

According to the Organisation for Economic Co-operation and Development (2025), responsible innovation refers to an ethical and trustworthy process of technological development grounded in democratic values, aimed at addressing societal needs, and committed to generating benefits for society. Integrating this paradigm into the development of emerging technologies helps align research, transfer and commercialization processes with social interests and priorities. Jirotko et al. (2017) argue that responsible research and innovation aim to ensure that the processes and outcomes of research are aligned with societal values, and for Stahl et al. (2023), responsible innovation can be understood as a process of increasing mutual responsiveness between societal actors and innovators that is meant to lead to increased acceptability, sustainability and societal desirability of innovation processes and outputs.

Thus, responsible research and innovation aims at “making new technologies work for society [...] without causing more problems than they solve” and is based on the following principles: research and innovation for social values, considering all impacts, stakeholders’ participation, governance and transparency (European Commission, 2016, p. 14).

3. Methodology

The study was conducted on a sample of 46 participants, consisting of teachers with various managerial responsibilities in pre-university educational institutions, including principals (59%), deputy principals (30%), and board members (11%). All categories of educational institutions are represented, including primary and lower secondary schools (35%), combined kindergarten, primary and lower secondary schools (15%), high schools (28%), colleges (high school level) (7%), vocational schools (2%), and institutions providing all levels of instruction (13%). From the point of view of the residential environment of the educational units, the group is divided into 50% rural and 50% urban, and according to the number of students in the educational unit, the largest representation in the research group consists of units with a number between 500 and 1000 students (48%), the rest being distributed as in the figure below.

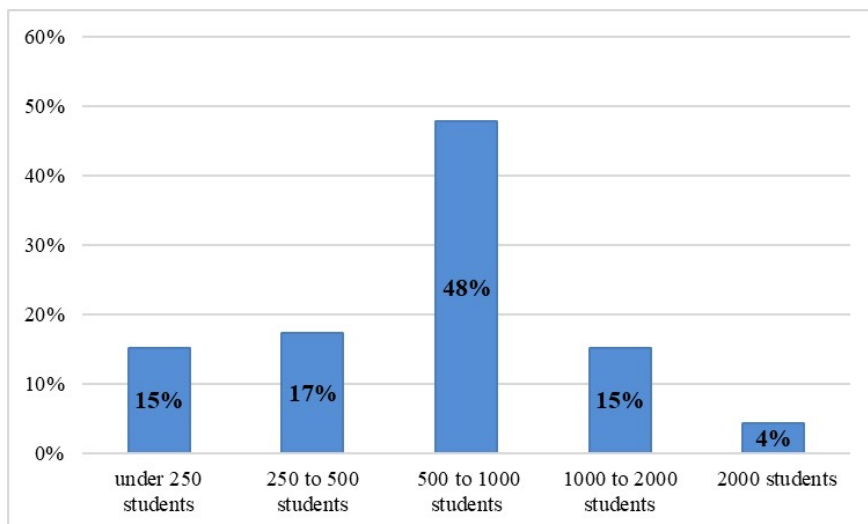


Figure no 1. Distribution of the batch of participants according to the number of students in the educational unit they represent

Participation in the study was voluntary, and the research was conducted using the opinion poll method. Data collection was conducted in two stages: the first consisted of administering a paper-based questionnaire composed of items of different types (with response options, Likert-scale items, but most of them open-ended, in order not to influence the respondents' answers in any way). The items were developed based on the four pillars specific to Responsible Innovation (anticipation, reflexivity, inclusion, and responsiveness). After completing the questionnaire, three focus groups were organized (the sample being divided into three groups), in which respondents were able to further develop and elaborate on some of the questionnaire items (e.g., the relevance of an innovation strategy at school level, and the enabling factors and obstacles in the innovation process). Therefore, the data obtained through the two research methods are complementary. The structure of the sample according to managerial experience describes a Gaussian frequency distribution curve (see Figure no. 2).

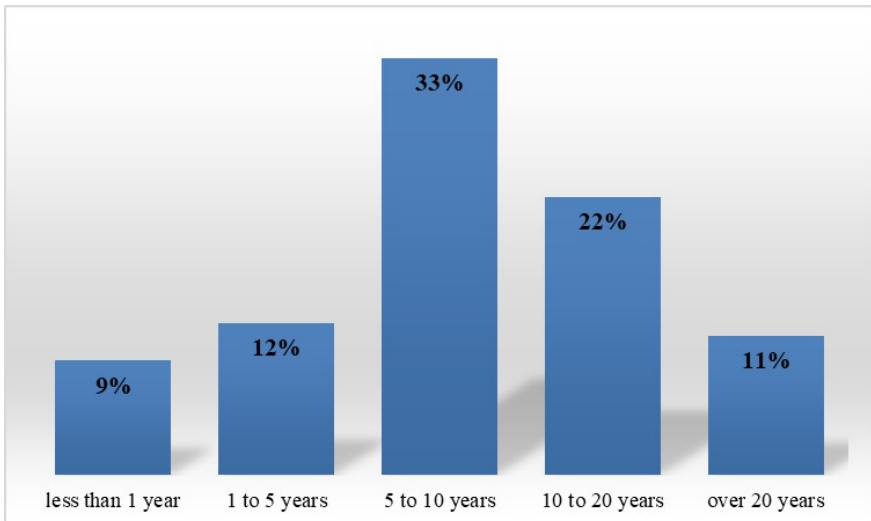


Figure no 2. Distribution of the group of subjects by experience in institutional management

According to other variables that we considered relevant for our study, the structure of the subject group is presented in Table no. 1.

Table no 1. Structure of the subject group

	Variable	Frequency
Specialty	Mathematics and Natural sciences	26%
	Language and communication	17%
	Social studies	17%
	Primary and preschool teacher	17%
	Vocational (theology, physical education)	11%
	Others	11%
Gender	Female	80%
	Male	20%
Level of training	Teaching degree I	82%
	Teaching degree II	11%
	PhD	7%
Age	Under 25	2%
	25 to 35	11%
	36 to 50	46%
	Above 50	41%

4. Results and discussion

The way in which school managers relate to the concept of innovation defines the direction in which this process is implemented at the level of educational units. The responses provided by the study participants outline four conceptual categories, summarized in Table no. 2.

Table no 2. Distribution of responses to the item “What is, in your view, innovation in education?”

Category	Frequency
adaptation to individual and societal needs	35%
optimization, efficiency	26%
digitalization	24%
openness to novelty	17%
no answer	4%

We note that multiple responses were possible for this question. The largest

proportion (35%) falls within the category of respondents for whom innovation in education refers to adapting the school to the needs of students and society, as shaped by current changes. In other words, innovation in education is understood as ensuring “a new school for a new society,” a perspective we consider pertinent. However, this requires a thorough understanding of the characteristics of a society increasingly dominated by digital technology, on the one hand, and of the structural and functional dimensions of the education system, on the other hand.

In the next position, 26% of respondents define innovation in education in terms of optimizing and increasing the efficiency of the educational process, with an emphasis on the use of existing school resources. A similar proportion (24%) corresponds to respondents who associate innovation in education with digitalization processes and the implementation of technologies. Finally, 17% of the managers included in the study define innovation as “openness to the new,” without further specification of its meaning.

The next item asked respondents to assess, on a scale ranging from *not at all* (0) to *a very high extent* (5), the level of innovation across the main dimensions of the educational process in the schools they represent. Based on the data summarized in the diagram below (Figure no. 3), we observe that, at

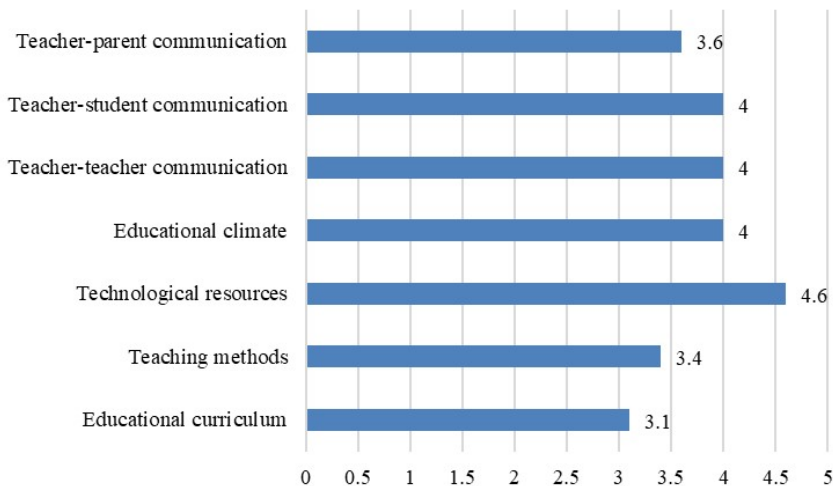


Figure no 3. The corresponding levels of innovation in the educational units represented in the study

the extremes, the integration of technological resources records the highest mean value (4.6), while curriculum innovation registers a lower mean value (3.1). At a relatively close level is the innovation of teaching methods, with a mean score of 3.4.

When asked about the factors supporting the innovation process in schools, 74% of respondents referred to European-funded projects (most frequently PNRR, PNRAS, and Erasmus+), used for the equipment and modernization of schools (with the support of local authorities) and/or for the professional development of teaching staff (through training courses or participation in mobility projects). In 52% of the responses, reference was made to the support received for digitalization as an element of innovation in education. Corroborating the data recorded for the three items, we may conclude that innovation in the schools participating in the study is understood primarily as the introduction of digital technology and modernization, supported by community funding. In our view, this aspect is necessary for the innovation process, but not sufficient. Technology should not be regarded as an end in itself, but rather as a tool for ensuring a high-quality teaching process. UNESCO Strategy on Technological Innovation in Education (2022–2025) promotes individual-centred technological innovation in education, with a view to ensuring equitable, inclusive and quality education, as well as universal access to lifelong learning. “Technology should be designed to serve people in accordance with internationally agreed human rights frameworks and principles” (UNESCO, 2021, p. 1). Technological innovations in education must contribute to “more just, equitable, peaceful, and sustainable knowledge societies” (p. 1). One of the areas of action is enhancing the quality of teaching and learning (UNESCO, 2021).

One of the most thought-provoking questions in the questionnaire, as also highlighted in the focus group discussions, concerned the existence of an innovation strategy developed at the school level. For this question, respondents could choose one of the following options: No; No one required it of me; I did not think about it; Yes, on my own initiative; Yes, it was required of me; Other answer. The responses were subsequently grouped into three categories: Yes, No, and Other answer, as shown in the diagram below (Figure no. 4).

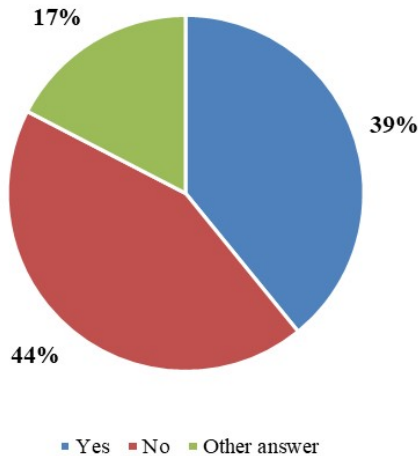


Figure no 4. Frequency distribution for the item: *Is there an innovation strategy at the educational unit level?*

One can notice that the affirmative answers (39%) are somewhat balanced by the negative answers (44%), in favour of the negative ones. A significant part of the respondents (17%) selected the option “other answer” without providing further details, suggesting that there is no clearly outlined and assumed innovation strategy at the level of the educational unit. The 44% of the negative answers are divided into two subcategories: 24% who chose the answer option “No”, respectively 18% who opted for the option “I didn’t think about it” and 2% (one respondent) who chose the option “No one required it of me”. In the “Yes” category, 39% of respondents are divided into 37% who stated that they have such a strategy on their own initiative, and 2% (one respondent) who indicated that “It was required of me.” From the responses provided to the subsequent question, in which respondents were asked to detail or justify their choice, only two respondents (4%) among those who stated that they have an innovation strategy on their own initiative indicated that this strategy is a clearly defined component of the management strategy documents (Institutional Development Plan). In the other cases, “there is no written document” in this regard, but innovation is implicitly embedded in the actions carried out at the school level. This indicates that school managers are concerned with school innovation and support educational policies for innovation in education, even in the absence of a

specific innovation strategy. This approach is based on a realistic analysis of resources and needs at the school level (the SWOT analysis being a highly useful tool in strategic management, as it confronts the internal and external conditions of the institution).

Another question targeted the managers' perception of the link between research and innovation in the educational field. A very large proportion of respondents (89%) indicated, in various forms, that there is a connection between the two concepts ("close relationship" – 26%, "innovation implies research" – 46%, and "interdependence" – 17%). In general, respondents emphasized the importance of research for the innovation process in education, stating that "without research we will not know what to innovate", "research provides data for the innovation strategy", "thorough research is necessary to successfully implement any change", etc. However, for the most part (59%), this research occurs only on the elaboration of the methodological-scientific paper for obtaining the Teaching Degree I¹, without it being a current practice within the school. For the remaining 37% of respondents, educational research consists, in most cases, of participation in professional development programmes/continuous training courses, workshops, round tables, symposia, conferences, educational projects, and experience exchanges. The table below summarizes the answers to the questions in the questionnaire regarding the connection between research and innovations in education.

Table no 3. *Frequency distribution for the variable "link between research and innovation in education"*

	Item	Frequency
<i>How do you see the connection between research and innovation in education?</i>	There is a connection (close, inter-conditioning, innovation requires research)	89%
	There is no connection	2%
	No answer	9%
<i>At what level is educational research conducted in your school?</i>	Only in the context of professional teaching development (through the preparation of Teaching Degree I papers)	59%
	It is a common practice in school	37%
	Another answer	4%

The Law no. 198/2023 on Romanian pre-university education, Chapter III. *Professional profile and roles of teaching staff*, art. 167(1) establishes the roles of the teaching staff, in the professional career, necessary for carrying out the educational activity under optimal conditions. Among these, paragraph f) specifies that it is a “promoter of innovation in education”. Therefore, teaching staff are called to support and promote the innovation process in education, being the most important factor in translating innovations in education into visible effects on the outcomes of the process, namely the competencies of its direct beneficiaries, i.e., students. In our opinion, this represents the final and most important segment of the innovation process: the teaching–learning process carried out within the teacher–student interaction, for which the teaching staff should have all the resources necessary to regulate and optimize it. Among these resources, an essential role is played by the educational research competence. This is materialized through a critical/reflective approach to the elements of innovation and an objective evaluation of the effects/results obtained, in relation to real and sustainable expectations and needs, at the individual and social level. For responsible innovation, educational research should be a fundamental dimension of the teaching competence and a current practice in school, a fact contradicted by the answers provided by the respondents.

Moreover, Law No. 198/2023 on Romanian pre-university education, Chapter XVI *Rights and obligations of pre-university education personnel*, stipulates in Article 222 *the right to professional initiative, which consists in [...] c) putting into practice innovative ideas for the modernization of the education process*. However, among the factors identified as difficulties/obstacles to innovation in schools, 48% of respondents referred to teachers, citing resistance to change among some of them, as well as the reluctance – particularly among older teachers – to use digital technology and/or to implement new teaching methods (e.g. “reluctance of some older teachers towards new teaching methods and/or technology”, “resistance to change”, “outdated mentalities and inertia of teachers to accept change”, “reluctance and unavailability of some teachers”). By comparison, only 37% of respondents mentioned teachers as a support factor in innovation in school, through participation in advanced training courses and practical implementation of innovative elements in the classroom (digital technology and teaching methods). In our opinion, there is a persistent lack of confidence

on the part of some teachers in educational innovation, which also comes from the lack of an innovation strategy at the institutional level, understood and assumed by the entire teaching staff.

The innovation strategy at the institutional level also includes risk management. When asked about the risks that may be associated with the innovation process, the answers fell into the following categories: negative effects on the health and well-being of students and teachers, mainly with reference to the excessive use of technology (21%); ethical problems among students, namely the accentuation of the differences between urban and rural environment, or the socio-economic status of families (11%); disruptions to the educational process (37%) in various ways, including “deepening chaos in the system”, “failure”, “not obtaining the desired results”, “innovation for the sake of change”; loss of valuable traditional practices (14%). It is worth mentioning that 12% of the respondents did not give any answer, and for 2% there is no risk associated with innovation. Several answers were possible to this question. We identify, among these responses, defining elements of responsible innovation (Bates et al., 2019), particularly from the perspective of anticipating the risks associated with the innovation process, which can be managed through an institutional-level strategy that takes into account specific contextual characteristics.

It is also worth noting that 98% of the respondents indicated that the innovation of teaching methods must be done selectively and not by replacing the traditional ones with new ones. The arguments most frequently invoked are the continued use of traditional methods that are still effective, alongside the complementary introduction of new methods (“we do not want to create another school, but a better school”, “what is good should not be changed just for the sake of change”).

Through participatory institutional management, the risks associated with innovation in education are identified and analysed, and measures are designed to anticipate and mitigate or eliminate potential effects. As a result, the degree of involvement and accountability of teachers in the educational innovation process is expected to increase.

5. Limitations of Research

Caution is required in generalizing the results, taking into account the size and regional nature of the group of subjects included in this research. Future studies conducted by expanding the geographical area and implicitly expanding the group of subjects could provide a much clearer picture and more conclusive results regarding the situation of innovation in education at the national level.

6. Conclusions

In this broad and complex process of school transformation, we consider the question “Where are we?” to be pertinent. Therefore, we have undertaken a diagnostic research process, aimed at identifying possible solutions that would streamline the innovation process, recognize the joint effort, and compensate for the resources invested (human, material, time, etc.). We aimed to highlight what is well done and to identify aspects that can be improved. Obviously, we do not claim to have conducted an exhaustive study; however, we consider that the data collected from the sample are largely relevant, pertinent to the research objectives, and constitute valuable benchmarks for a sound analysis of the management of the innovation process in education in the south-eastern area of Romania.

The results of the analysis are summarized in a few main conclusions:

- European policies on innovation in education are reflected in national-level decisions and supported by non-reimbursable funding projects aimed at the modernization of schools and their digital equipment;
- the training of teaching staff is generally a priority at school level, being encouraged by educational policies and supported both legislatively and financially through non-reimbursable funding projects;
- staff involved in educational management (principals, deputy principals, board members) are concerned with innovation at the level of educational units;
- innovation tends to occur predominantly in a top-down manner, often imposed in accordance with national strategies, with limited scope for adapting these changes to the concrete, context-specific needs of educational units, in the spirit of responsible innovation, and without a clearly defined strategy with personalized targets and objectives.

Even though they are not always integrated into a formalized strategy, there are some local innovation initiatives at the level of educational units. Therefore, to streamline this process, we consider it necessary to:

- encourage and support the strategic management of innovation at the level of educational institutions, based on research and analytical tools for identifying existing needs and resources (i.e., SWOT analysis), as well as for assessing the effectiveness of actions taken at institutional level, in order to balance investment and outcomes, in line with the principles of Responsible Research and Innovation, as “an approach for making research and innovation a collaborative, intergenerational and democratic process” (Rodríguez et al., 2018, p. 1255);
- encourage and support initial and continuous training of teachers for educational innovation, by developing a critical and reflective attitude, a “critically responsible teacher” (Javrha & Kalina, 2010), in the spirit of responsibility in innovation, based on the results of educational research on the efficiency of technology and innovative practices in classroom teaching, taking into account the fact that “one important aspect of responsible innovation is to provide training on its principles and practices to current and future researchers and innovators” (Stahl et al., 2023, p. 1);
- shift the focus from innovation as an end in itself to innovation as a means to increase the quality of education.

In conclusion, innovation in education is necessary, but for it to be effective, it must be grounded in clear answers – based on research findings – to a series of questions: *What do we innovate? Why do we innovate? When do we innovate? How do we innovate? With what results do we innovate?*

Note

¹ The continuous professional development of teaching staff in Romanian pre-university education, in accordance with Law No. 198 of July 4, 2023, on Pre-university Education, Chapter VIII, stipulates in Article 185(2) that career advancement is achieved by obtaining Teaching Degree II, Teaching Degree I, and the title of *emeritus professor*. Pct (8). The evaluation for obtaining the teaching degree I includes [...]. c) the development of a methodological-scientific work, which includes educational resources developed by the teaching staff, based on micro-research applied at the level of teaching activity under the guidance of a scientific coordinator [...].

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