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# Challenges for teacher training in the key of inclusion

## *Retos y desafíos para la formación docente en clave de inclusión*

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## Abstract

This work is part of a research about teacher training needed to meet the diversity of students from an inclusive perspective. Teacher training programs must innovate in order to improve for the benefit of all, in addition to contemplating the inclusive approach so that it will lead to an improvement in the quality of teaching in the classroom. The main objective is to know the level of training of teachers in extended school day centers in vulnerable areas of Santo Domingo, in order to make proposals to guide training towards the creation of an innovative and inclusive culture. The data were collected through a questionnaire of closed questions, an in-depth interview and an observation script, applied to 29 participants; the questionnaire is the central instrument, and the interview and observation script are the complementary ones. The data were analyzed following a mixed methodology, combining a quantitative and qualitative approach. The research had a descriptive approach based on random probability sampling. The main findings indicate that most teachers value innovation to improve the quality of the educational process in favor of inclusion; however, they have difficulty in their training, knowledge, skills and abilities to integrate it in the classroom. The discussion and conclusions allow us to make suggestions to guide teacher training in the key of inclusion based on a culture of innovation and educational improvement.

Keywords: education, inclusion, training, teacher, innovation, improvement.

## Resumen

Este trabajo forma parte de una investigación sobre la formación del profesorado necesaria para responder a la diversidad de estudiantes desde una perspectiva inclusiva. Los programas de formación docente tienen que innovar para mejorar en beneficio de todos, además de contemplar el enfoque inclusivo para que revierta en la mejora de la calidad de la enseñanza en el aula. El objetivo principal es conocer el nivel de formación del profesorado de centros de jornada escolar extendida en zonas vulnerables de Santo Domingo, para realizar propuestas que orienten la formación hacia la creación de una cultura innovadora e inclusiva. Los datos fueron recolectados mediante un cuestionario de preguntas cerradas, entrevista a profundidad y guion de observación, aplicados a 29 participantes; el cuestionario es el instrumento central, y los complementarios son la entrevista y guion de observación. Los datos se analizaron siguiendo una metodología mixta, combinando el enfoque cuantitativo y cualitativo. La investigación tuvo un enfoque descriptivo a partir de un muestreo probabilístico aleatorio. Los principales hallazgos señalan que la mayoría del profesorado valora la innovación para mejorar la calidad del proceso educativo en favor de la inclusión, sin embargo, presentan dificultad en su formación, conocimientos, destrezas y habilidades para integrarla en el aula. La discusión y conclusiones permiten realizar sugerencias para orientar la formación docente en clave de inclusión a partir de una cultura de innovación y mejora educativa.

Palabras clave: educación, inclusión, formación, docente, innovación, mejora.

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## 1. Introduction

This work is part of the R+D+i Project, PID2019-108230RB-I00, funded by MCIN/AEI/10.13039/501100011033. Education in the context of the 2030 Agenda and the Sustainable Development Goals (SDGs) is in the process of adaptation that involves thinking about effective mechanisms to develop skills in citizens and respond to the challenges posed by the advancement of science and technology with quality and equity. The development of these skills depends on innovation in education towards a learning model that links human resources with global demands and "promote creative-productive thinking, decision-making, problem solving, learning skills, collaboration and self-management" (Cahyani, 2019, p. 384). Innovation is the eit her generation or creation and production of useful knowledge to transform society in favor of an active and participatory learning culture that also stimulates reflective and critical thinking and meaningful learning (PNI2030, 2022, p. 15). Other authors (Rodríguez, 2022) refer to inclusive scientific and technological practices that require changes in teacher training, including the academic career and that pose a challenge for teacher training and a significant challenge to invest in innovative training programs (Owen and Pansera, 2019). Martínez (2021), refers to the personal and shared reflexive learning and the problematization it can generate in the professional practice of the teacher and in decision making. In this sense, Pascual and Navío (2018) define innovation in education as "any change generated inside or outside an institution, oriented towards improvement, (...)" (p. 76). It is therefore an educational procedure different from established practices whose purpose is to improve educational efficiency through "pedagogical innovation, scientific and methodological and technological innovation" (Troncoso *et al.*, 2022, p. 4).

In this sense, innovation accelerates the development of skills and promotes the change in teachers and students in the way of thinking. One of its characteristics is "the opportunity to learn from others and with others based on the methodological foundations of collaborative learning" (Del Río, 2021, p. 175), although some institutions do not consider innovation as a "strategic asset" (Pérez, 2022, p. 4) because they could stayas is, up to you as improvement in the quality of the functioning of educational institutions. This author recommends that institutions incorporate innovation processes in strategic plans to generate internal and permanent spaces for training and accompaniment to innovation. Innovation is the key to transform educational systems, the promotion of autonomy, useful learning, critical and creative thinking; in this sense, Trimmer *et al.* (2020) state that "for innovation to make sense it will require a professional exercise that has openness, updating and a proposal for continuous improvement. (...)" (p. 9). On the other hand, Cabero and Martínez (2019), address teacher training in technological and instrumental competencies as a basis for initial and continuous teacher training, in the framework of inclusive education.

In this sense, the Dominican Republic advocates for this proposal of continuous improvement and recently issued Decree 278-22, which approves the National Innovation Policy (PNI2030), based on four pillars, where No. 2 refers to human capital, and states "the strengthening of the competencies of human talent facilitates the insertion in the knowledge society (...)" (PNI2030, 2022, p. 16). To promote these skills in citizens it is necessary to strengthen digital competencies, promote a change of mentality and the creation of a culture of innovation from school, because although it is true that the traditional model prevails on the teaching activity in schools, it is no less true that the training is not aimed at developing innovative competencies, and "as result the reproductive acts in professional training at the risk of offering people more reproduction than innovation" (García *et al.*, 2022, p.1). Other authors understand that innovation in technology for educational improvement involves rethinking the way of thinking, evaluating and analyzing the methods and mechanisms used to generate change, such as Gómez *et al.* (2020), stating that "the arrival of information and communication technologies (ICT) in the educational system has led to numerous new and interesting resources in the classroom" (p. 36). However, the teacher is not able to take advantage of it, being this the problem addressed by this research: "the teacher training necessary to carry out inclusive, innovative and creative educational processes". Although the approach is complex due to its nature and didactic, pedagogical, methodological, and technological implications, it is necessary to overcome

the competency gap perceived in the teacher and that negatively influences the integral development of the student.

### 1.1. Educational Innovation as the Axis of Teacher Training: Dominican Republic Case

The development of educational innovation and teacher training in the Dominican Republic is based on the Constitution of the Republic, General Education Law 66-97, National Innovation Policy, PNI2030, and the Comprehensive Teacher Training, Quality and Equity Policy of the Ministry of Higher Education, Science and Technology (MESCYT), the latter being the regulatory body for teacher training and guarantor of the quality of Dominican higher education. It is understood that "a determining factor of the teaching-learning process is the teacher, given the complexity of the challenges involved in preschool, continuous and professional development, there must be a comprehensive view for teachers of initial, primary and secondary" (MESCYT, 2021, pp. 8-10). The Rules for Regulating the Development of Teacher Training Programs in the Dominican Republic (Regulation 09-15) have been subjected to profound debates and modifications aimed at adapting the teacher training system to current requirements; this reform serves as a basis for educational institutions to reconsider the need to prioritize and assume the pedagogical approaches that best respond to the development of competencies and skills.

The problem lies in the fact that Is there evidence multiple barriers in teaching practices and as Arancibia *et al.* (2020) state, "not sure if its manifest or manifests themselves in beliefs, resistances and negative attitudes towards pedagogical innovations, there is a persistence in obsolete teaching and evaluation methodologies, a lack of perception of the importance of innovating" (p. 90). This situation may have originated because sometimes teacher training is approached superficially and lacks a previous study of teaching needs on which to base initial and continuous teacher training, being considered as a secondary element in the processes of teacher improvement (Aguavil *et al.*, 2019). Teaching practices have a direct impact on the development of skills and abilities of students, as well as on the acquisition of knowledge through own experiences (Sarmiento *et al.* (2021). Likewise, López *et al.* (2022), not sure if it should be argues (third person) that "several studies agree on the need for teachers to innovate their teaching methods, combining resources and employing spaces that motivate students (...)" (p. 46), since traditionally educational innovation has been more focused on learning processes and not on teacher training to learn to teach (Palacios *et al.*, 2021). Acosta (2018) says that "while many creative and innovative processes are implemented in the classroom, not all have continuity over time, since they often depend on the effort of a particular teacher" (p. 4). In this sense, Savina (2019) also raises the existence of a moderating influence of the professional factor in the innovative activities of teachers.

Therefore, the need to promote methodological innovation in Dominican teachers remains a topic of reflection. This is the framework of this research, to promote the reflective construction to overcome the obstacles that prevent its progress in the educational process. The research will highlight some evidence of the teacher's voice, which contribute to innovation from initial and continuous teacher training to transform advanced traditional practices into a new inclusive and innovative educational system.

### 1.2 Approach to the problem

The centers of initial, primary and secondary extended school day (ESD) of vulnerable areas in Santo Domingo characterize by absence of environments that favor innovation and creativity, limited knowledge of teachers on how to innovate, poor development of digital competencies, inaccessibility to the resources that enable innovation, professional and training gap of teachers to support innovation as a mechanism to promote critical and creative thinking, weakness in the use and mastery of innovative strategies and the inadequacy of educational centers for creating a culture of innovation. The current situation and the background exposed allow to approach the research from the following questions: 1) What is the training level of teachers working in the ESD of vulnerable areas in Santo Domingo and how to approach their training to be inclusive and innovative? 2) How should teachers be trained to address innovation as a culture in the classroom of the initial, primary and secondary levels? 3) Are there evidence of the use and integration of current

technologies and the improvements they produce in learning outcomes in students?

## 1.3 Objectives

The above questions constitute the problem of this research, whose general objective is "to know the training level of teachers in educational innovation of the initial, primary and secondary level working in ESD centers of vulnerable zones in Santo Domingo, to propose suggestions that orient the training towards the creation of an innovation culture in the teaching and learning process". The other objectives in which the general objective is specified are: 1) To determine the training level in educational innovation possessed by teachers working in the ESD initial, primary and secondary educational centers of vulnerable areas of Santo Domingo. 2) To propose suggestions to guide teacher training towards the creation of a culture of innovation in teaching and learning. The variables or categories: educational innovation and teacher training have allowed to hypothesize: the higher the level of teacher training, and the higher the level of progress in educational innovation.

## 2. Methods

Basic elements are addressed for conducting the research to define the logical relationship followed in the problem approach, methodology, design, sampling, data collection and procedures for analysis and interpretation of data (results). The methodology is descriptive (Carballo and Guelmes, 2016), correlational, non-experimental, cross-sectional approach with a mixed approach (Carhuancho *et al.*, 2019; Ramírez and Lugo, 2020) that combines quantitative research, as it uses a structured research instrument; a closed-question questionnaire; and qualitative research, as uses in-depth interviews and the observation script. The techniques used for analyzing the data in the case of the questionnaire were descriptive statistics through absolute and relative frequency. The data are presented by frequency tables; as for the interview a transcription of the data was performed, and the observation script was done through a checklist. Regarding the analysis and interpretation of the data, the information was grouped by centers, dimensions and subdimensions, was interpreted and conclusions were obtained.

## 2.1 Participant Sample

The sample belongs to the province of Gran Santo Domingo, municipality of West Santo Domingo. For collecting the data, a probabilistic sample was used through a simple random selection, with a total of 29 teachers from three public and ESD educational centers (hereafter 1, 2, 3), attending the initial, primary and secondary levels. The questionnaire included the total of the selected sample presented in Table 1; the interview reduced the sample to ten participants characterized in Table 2 and the observation script was reduced to six participants presented in Table 3.

**Table 1.** *Sample constituted by the teachers consulted in the questionnaire*

| Case | Teacher code | Type of center | Specialization of the teacher |
|---|---|---|---|
| 1 | 001,002,003, 004, 005, 006, 007, 008, 009, 010, 011 | Initial and Primary Education | Education - Humanities |
| | | | Initial Education |
| | | | Elementary Education |
| | | | Education - Maths |
| | | | Physical Education |
| | | | Education - Natural Sciences |
| | | | Education - Social Sciences |
| | | | Religion |

| Case | Teacher code | Type of center | Specialization of the teacher |
|---|---|---|---|
| 2 | 012, 013, 014, 015, 016, 017, 018, 019, 020 | | Education - Humanities |
| | | | Education - Maths |
| | | | Initial Education |
| | | | Education - Social Science |
| | | | Basic Education |
| | | | Education - Maths |
| | | | Education - Humanities |
| 3 | 0,21, 022, 023, 024, 025, 026, 027, 028, 029 | Secondary Education | Education - Social Sciences |
| | | | Physical Education |
| | | | Dentistry |

*Samples of participants in the interview*

**Table 2.** *Codes and criteria for selecting participants in the interview*

| Code | Years of experience | Working area | Degree | Role |
|---|---|---|---|---|
| 003 | 12 | Coordination | Degree in Humanities | Teacher coordinator |
| 005 | 18 | All the areas | Degree in Initial Education | Teacher |
| 007 | 1.5 | All the areas | Degree in Basic Education | Teacher |
| 012 | 16 | Coordination | Degree in Education in Maths | Teacher coordinator |
| 015 | 10 | All the areas | Degree in Initial Education | Teacher |
| 019 | 10 | All the areas | Specialization in Maths | Teacher |
| 021 | 05 | Natural Sciences | Dentistry | Teacher coordinator |
| 027 | 05 | Physical education | Degree in Physical Education | Teacher |
| 029 | 05 | Social Sciences | Degree in Social Sciences | Teacher |

*Sample of participants in the observation*

**Table 3.** *Codes and criteria for selecting participants for the observation*

| Code | Years of experience | Working area | Degree | Role |
|---|---|---|---|---|
| 008 | 28 | Coordination | Degree in Humanities | Teacher |
| 010 | 21 | All the areas | Degree in Initial Education | Teacher |
| 014 | 05 | All the areas | Degree in Initial Education | Teacher |
| 017 | 04 | All the areas | Degree in Basic Education | Teacher |
| 023 | 05 | Spanish | Master | Teacher |
| 025 | 18 | Math | Master | Teacher |

## 2.2 Instruments

Three instruments were used to know the training level in educational innovation of teachers in ESD centers in vulnerable areas of Santo Domingo: questionnaire, in-depth interview, and observation script. 63 items were used in the questionnaire, 17 for the interview, and 17 in the observation script. These were validated by judgment of 18 experts, with characteristics similar to the sample selected, their contributions were included in the final version. The instruments are organized into three dimensions: Intellectual Stimulation (ESIN), Knowledge and Skills Development (DCH) and the Legal, Philosophical and Social Perspective (PJFS), broken down into thirteen sub-dimensions presented in Table 4. The questionnaire was self-administered, and the interview and the observation script were personal.

A Likert scale of 5 points was used for measuring the questionnaire, where value 1 indicates "never" and 5 "always". The analysis and interpretation of data from the questionnaire was performed using EXCEL, by centers, dimension, subdimension and items. Results are presented using frequency tables and graphs (inferential statistical analysis). The interview used the transcription technique of participants' responses and the observation guide checklist with the registration of relevant aspects for the research. The three instruments contain two sections: general data, and dimensions and subdimensions.

**Table 4.** *Categories, dimensions, and subdimensions*

| Categories | Dimensions | Sub-dimensions |
|---|---|---|
| Teacher training | Intellectual stimulation | The competencies to perform inclusive educational processes |
| | | Teacher training to manage individual differences |
| | | The creativity for developing good practices |
| | | Innovation in the teaching-learning process |
| | | Teacher leadership in the school |
| | | The teacher´s professional ethics and its application in the teaching practice |
| | | The teacher´s motivation to deal with the community |
| | | The teacher´s empathy with the group |
| | | The teacher´s inspiration in the teaching practice |
| | | The teacher´s empathy with the group |
| | | The knowledge of human rights focus on inclusion |
| Inclusive education | Law, Philosophical and Social Perspective | Knowledge of the teacher on inclusive law |
| | | Equal treatment for all students |
| | | Good environment at work |

## 2.3 Procedure for analysis

The two categories were maintained in the organization of the data for its analysis: teacher training and inclusive education that were disaggregated in the dimension of intellectual stimulation and four subdimensions. The analysis was carried out at three levels: the level of educational centers, the dimensions and the subdimensions, specified in table 5. The results are presented according to the third level.

**Table 5.** *Categories and organization levels for data analysis by schools, dimensions and subdimensions, with their corresponding codes*

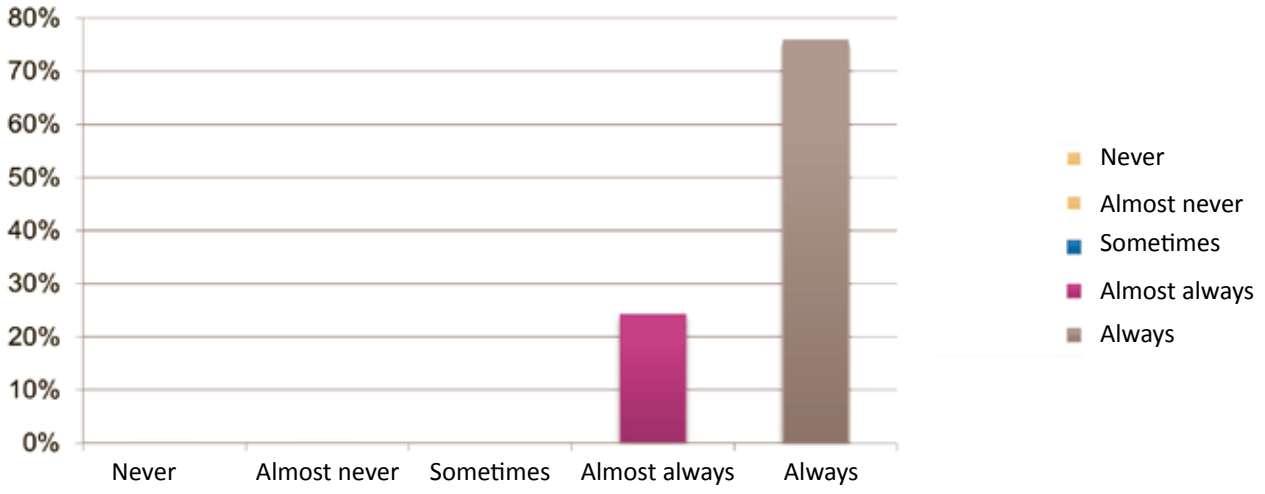
| Categories | Educational center | Dimensions | Sub-dimensions | Code/ Subdimension |
|---|---|---|---|---|
| Teacher Training (FD) | | Educational Innovation | The competencies to perform inclusive educational processes | CDPEI |
| Intellectual Stimulation (ESIN) | Case 1 | | The teacher training to handle individual differences | FDDI |
| | Case 2 | | The creativity for developing good practices | CDBP |
| | Case 3 | | The innovation in the teacher-learning process | IPEA |

## 3. Results

The analysis and interpretation of data began with the collection, recording and organization of information from fieldwork. In this case, only the results are presented according to the Intellectual Stimulation dimension (ESIN) and its subdimensions: the competencies to develop inclusive educational processes (CDPEI), teacher training in the management of individual differences (FDDI), creativity in the development of good practices (CDBP) and innovation in the teaching/learning process (IPEA) in schools (case 1, 2, 3).

Figure 1 shows that 76% of the teachers surveyed in the ESD centers of the initial, primary and secondary level, (case 1, 2, 3) answered that they "always" develop competencies in their students, while the other 24% answered "almost always"; however, in the interview and observation, most did not evidence the use of strategies for the development of competencies; they express: "we do not have strategies to respond to the students (...) (003 ,014), the MINERD must train us to meet the objectives of education (005, 017, 021), we must invest more in our training (008, 015)'. The answers reflect the need to develop the competencies that allow the application of the current curriculum, where innovation is a transversal axis.

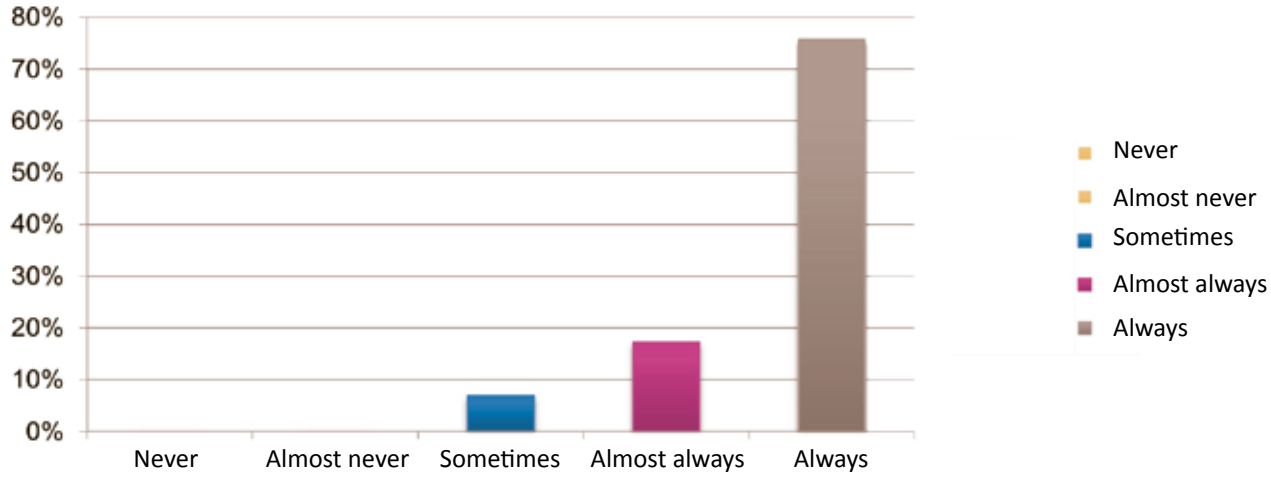
**Figure 1.** *Item 1.3 Are the following competencies developed in your classroom: ethics, citizen, communicative, logical, creative, and critical thinking, problem solving, scientific and technological, environmental and health, personal and spiritual development, on an equal footing for all students?*




*Note.* Data obtained from the instrument applied to the sample.

It is worrying that 76% of teachers surveyed responded "always" use strategies that promote the development of innovation and autonomy, mobilizing in an integrated way concepts, procedure, attitudes and values, 17% "almost always" and 7% "sometimes"; however, when triangulating the results, a high percentage is working with a methodology that places them in a traditional teaching model, stating: "to develop creative and innovative class you need training in methodology (08, 015, 029), (...) neither the university nor MINERD train us in managing strategy for developing competencies (003, 017 025)'. Figure 2 presents teacher reactions that show the didactic-pedagogical level and technological knowledge to develop educational processes with active and innovative strategies.

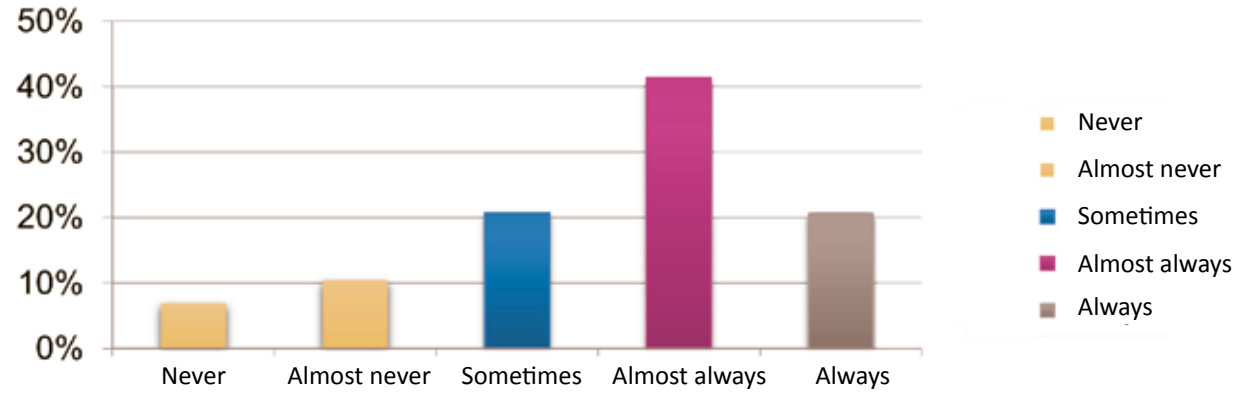
**Figure 2.** *Item 1.4 Do you use strategies that promote in your students the development of innovation and autonomy in diverse contexts, mobilizing concepts, procedure, attitudes and values in an integrated way?*




*Note.* Data obtained from the instrument applied to the sample.

The results of Figure 3 show that 7% of the surveyed teacher responded "almost never" the training received serves to respond to the educational needs of the student, 10% "never", 21% "sometimes", 41% "almost always", 21% "always"; it shows that the majority is prepared to develop quality educational processes; however, when triangulating the results, a high percentage of the teachers presents weakness in their training to respond to creative and innovative processes, they state: "The MINERD must empower us to attend the diversity of the classroom in an innovative and creative way (02, 05), the knowledge we were taught at the university is not enough, we need training to develop good teaching practices (010, 015, 019)'. The teacher's voice evidences the need for training to overcome the pedagogical, didactic, methodological, and technological gap in teacher training.

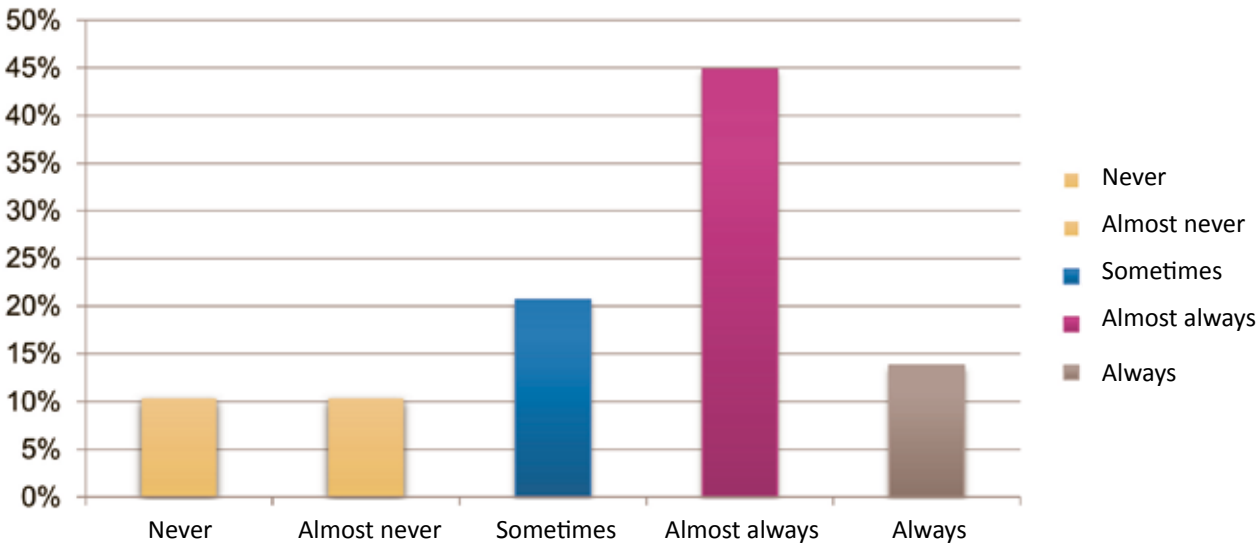
**Figure 3.** *Item 2.7 Does the training you received serve to meet the differentiated needs of your students, despite the responsibility and workload involved?*




*Note.* Data obtained from the instrument applied to the sample.

Regarding training in the use of innovative strategies to positively assess diversity; according to figure 4, 45% answered "almost always" is enough, 21% "sometimes", 14% "always", 10% "never" and 10% "almost never"; however, the results of the interview and observation are worrying since a high percentage have difficulty in the use of active and innovative strategies and express: "we have weakness in the use of active strategies (007, 0014, 0021), training workshops do not deal with these strategies, since it is taught by people who do not have enough knowledge (008, 012, 021)". It shows the need for teacher training based on an innovative approach that enable educational actions to respond to the needs of students.

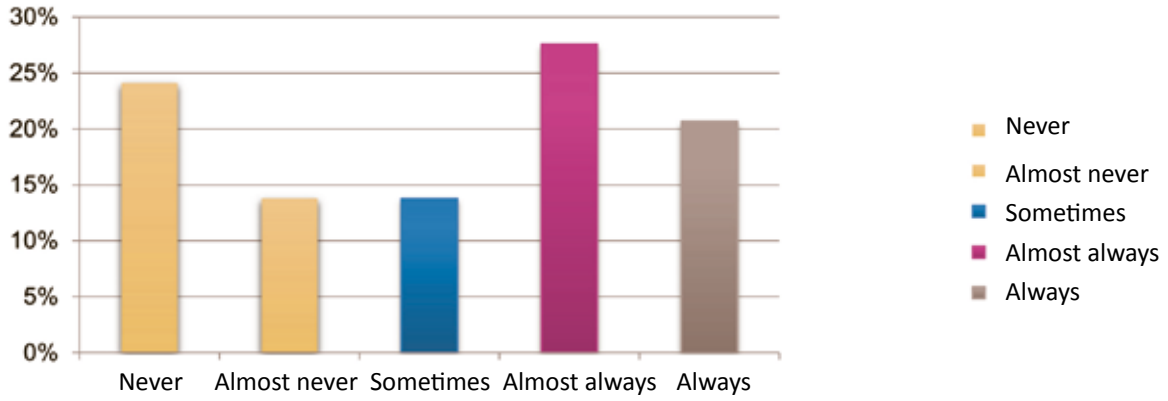
**Figure.** *Item 2.10 Do you have strategies that allow you to positively assess diversity in students attending the classroom?*




*Note.* Data obtained from the instrument applied to the sample.

The results presented in Figure 5, show that 28% of the teachers surveyed responded that "almost always" promote the participation of students in the process of new productions, 24% "almost never", 21% "always", 14% "never" and the other 14% "sometimes"; however, the results of the interview and observation show low participation of students in new production processes, stating: "the methodology that is easier and makes students participate is questions and answers (08, 012, 027), the participation depends a lot on the training we can have (…), lack of training in pedagogy (005, 017, 029)". The results confirm that teachers with a mastery of active methodologies and strategies are required.

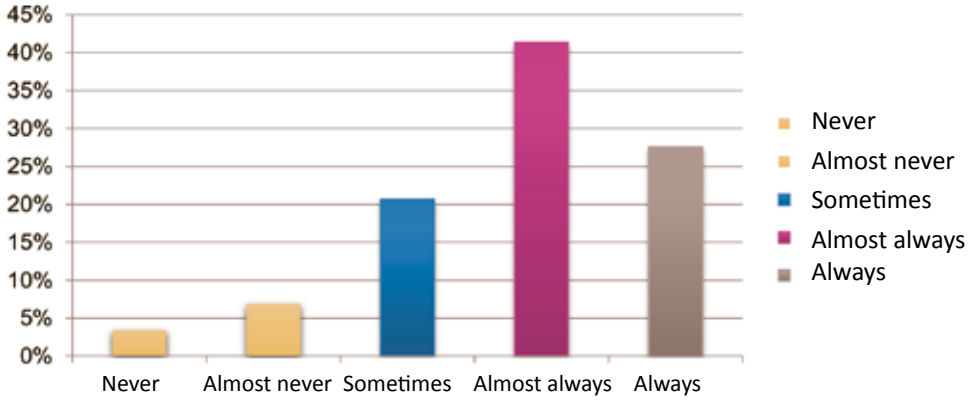
**Figure 5.** *Item 3.1 Do you promote in the classroom student participation in the process of new productions and prepare environments that emphasize the responsiveness of all students in creative ways?*




*Note.* Data obtained from the instrument applied to the sa*mple.*

Regarding the development of innovation in the educational process, the results presented in Figure 6 show that 41% answered "almost always", 28% "always", 21% "sometimes", 7% "never", 3% "almost never"; however, according to the interview and observation, the majority have difficulty in handling methods and strategies in a creative and innovative way, stating: "what limits the development of competencies in students is the lack of teacher training (012, 014), it is not easy to plan, there are many problems for didactic planning (005, 019, 029)". The responses highlight the need for an initial and continuous innovative training plan.

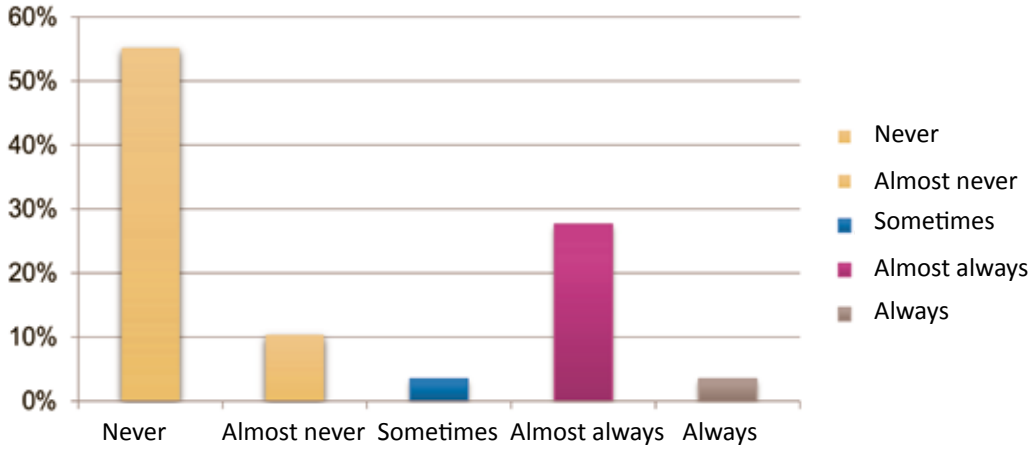
**Figure 6.** *Item 2.8 Do you have mastery of a variety of teaching and learning methods and strategies that you use in the classroom in order to improve students with different learning abilities in creative and innovative ways?*




*Note.* Data obtained from the instrument applied to the sample.

The results presented in figure 7 are worrying since 55% of the teachers surveyed say that the educational center has environmental conditions, adequate physical and technological infrastructure, as well as accessibility to audiovisual and technological resources for developing innovation, 28% said "almost always", 10% "never", 3% "sometimes" and 4% "always". In the interview and observation 100% confirmed that the centers are not suitable for educational innovation, stating: "there are not conditions in these educational centers to develop innovation (010, 017, 029), we lack resources, we have no internet, (010, 014, 021), in such conditions it is not possible to talk about innovation or creativity (003, 014, 021)". The results show a lack of conditions in infrastructure and technology to promote educational innovation.

**Figure 7.** *Item 4.1 Does the educational center have an adequate infrastructure for the development of science, technology and innovation and accessible to all students, even if they are different?*




*Note.* Data obtained from the instrument applied to the sample.

## 4. Discussion

The literature show that there are some challenges regarding the innovation capacity of schools to respond to the social context with quality and equity. Several authors point out that we still need to advance on teacher training from an innovative, creative and inclusive perspective (Booth and Ainscow, 2011), according to current social demands. Ríos and Ruiz (2020), state that "there is consensus among the different specialists who say that innovating in education (...) poses the challenge of overcoming personal, institutional or sociocultural obstacles associated with the transformative change process implied by innovation" (p.103). Ainscow (2020b) refers to global changes to promote inclusion and equity in schools. It is necessary "the creation of pedagogical dimensions that indicate the training competencies which must be presented by a teacher in the face of the new technological trend" (Hernández *et al.*, 2018, p. 672). Only an excerpt of the results is presented, therefore the discussion is based on objective 1 and answering the questions formulated.

*Objective 1. To determine the training level in educational innovation possessed by teachers working in the ESD educational centers of initial, primary and secondary education in vulnerable areas of Santo Domingo*

Regarding the level of teacher training at the initial, primary and secondary levels of ESD centers, and how to approach their training to be inclusive, innovative and creative; it is confirmed and assessed that 100% has a bachelor ´s degree as a; however, it can be seen that most present a gap in training that hinders the progress of innovation and reaffirms the need to raise the training level from an innovative perspective. It is suggested to the MESCYT, the Ministry of Education (MINERD) and the Higher Education Institutions (IES): 1) promote the policy reform of integral teacher training, quality and equity; 2) enable the implementation of plans and training programs aimed at the development of cog-

nitive, didactic, pedagogical, technological and innovation competencies, which allows to produce the structural change of the national educational system and promote a training system based on innovation in the classroom. Rossi and Barajas (2018), refer that "teachers demand training more consistent with their teaching needs, (...)", (p. 317) in the framework of a more inclusive training (López *et al.*, 2022).

The results highlight that a high percentage of the teachers consulted (case 1, 2, 3), are working with a methodology that places them in a traditional teaching model and their reactions show the low level of knowledge and limitations to face educational processes with active and innovative strategies. The teachers insist that the MESCYT, MINERD and the IES promote a paradigm change in teacher training that indicate the ways new generations learn and reinforce the essential competencies for constructing an innovative, creative, dignified, fair and equitable society, as stated by the MESCYT (2015):

> Teacher training programs must be structured and designed considering the characteristics of today's society, the demand for education to respond to society's needs and the skills required for a teacher who will have the responsibility of educating children and young people in the 21st century (p. 5).

It is confirmed that most teachers in ESD, even though they have a minimum level of Bachelor's degree, have not received specific training in educational innovation, nor is there evidence in the classroom of the use of active, participatory and inclusive strategies (Ainscow, 2020a). Hence, it is required that MINERD, the MESCYT and the (IES), address a reform and adaptation process of the training system to respond to the demands of society and the current curriculum, since "the very evolution of teaching practice (...) from the incorporation of Information and Communication Technologies (ICT), have generated new ways for teaching practices (...)" (p. 689).

Regarding the approach to innovation in the classroom of initial, primary and secondary of the ESD and evidence of the use of innovative strategies, it is confirmed that the majority show a favorable attitude towards innovation, suggesting that a way to achieve training in innovation and creativity could be achieved by implementing plans and programs of initial and continuous training where the need of the teacher is implied and include intervention or accompanying actions, aimed at strengthening competences, mastery and didactic, pedagogical, technological knowledge and the promotion of innovation and inclusion (Booth and Ainscow, 2011) because, "teachers know (...) that educational innovation produces changes and improvements" (Martínez *et al.*, 2022, p.71) that promote inclusion and equity in the classroom (Ainscow, 2020a, 2020b). Likewise, Torres (2021) argues that "actions carried out by the teacher (...) are related to the use of teaching and learning strategies, curriculum planning, application of didactics and methodology" (p. 3), which require training and transformation of the school in favor of inclusion (López *et al.*, 2022).

Teacher training from an innovative and inclusive perspective (Ainscow, 2020a), requires coherence between the training paradigm and the profile required by the curriculum. The consulted teachers insist that there is a gap in this aspect, where innovation is the great challenge that the MINERD, MESCYT and ESD must face, based on the fact that "if the teacher has a solid reflective critical training, he/she will be better prepared and willing to any change" (Aranga *et al.*, 2022, p. 4). In addition, it facilitates "that the role of the teacher changes from a traditional perspective to an innovative digital one" (Sánchez *et al.*, 2020, p. 1). In this regard, Morales and Rodríguez (2022) propose "updating, linking and aligning the educational programs offered by universities" (p. 26) and the professionalization of inclusive teachers (Torres, 2021).

Regarding the integration of technologies to produce improvements in student learning outcomes, the challenge for the Dominican educational system remains in terms of digital literacy of teachers, adequacy of physical and technological infrastructure and access for students and teachers. However, Marín *et al.* (2022) argue that "teachers, both in the practice and in the training, should try to train themselves and know the alternatives offered by these technologies (...)" (p. 2). In this sense, most teachers of the initial, primary and secondary level of the ESD, vulnerable areas of Santo Domingo (case 1, 2, 3), lack knowledge and mastery of them. Hence, it is suggested to the MINERD to mobilize resources for the adequacy of the physical and technological infrastructure, as well as to implement a systematic and continuous training process focus on the application of current technologies and the use of

active strategies that enable innovation in the center. According to Cabero *et al.* (2019), "it will be essential to carry out personalized teacher training plans that allow placement at advanced competency levels, such as those focused on innovation and teaching leadership with ICT" (p. 369).

It seems that the weaknesses evidenced in this research are related to the development of pedagogical, didactic, digital and innovation competencies, as well as the adequacy of the learning environment; however, "teachers have to guarantee (...) the best educational results" (Ainscow, 2020a, p. 8). We agree with Malpica (2018) when saying that "it is necessary to find a balance between the development of personal learning environments and institutional teacher training" (p. 22). Likewise, Guzmán *et al.* (2021), state that "the use of ICT, TAC and PET as fundamental elements of educational innovation (...) should be considered in the design and development of the initial, continuous and permanent training curriculum" (p. 153) to promote inclusive education (Booth and Ainscow, 2011), since it will make it easier for the school to "include more proactive and creative learning strategies and experiences" (Okoye *et al.*, 2020, p. 138), and promote the teachers professionalization in the inclusion (Torres, 2021). In addition, it will "ensure comprehensive teacher training, with emphasis on content mastery, on teaching methodologies appropriate to the curriculum, participatory pedagogical tools and skills for the use of ICT with the purpose of facilitating continuous innovation (...)" (MESCYT, 2022, p. 21).

## 5. Conclusions

The discussion and analysis allow concluding proposals for improvement to guide teacher training from an innovative and inclusive learning perspective in the initial, primary and secondary level of ESD. These are presented based on objective 2.

To confirm the need for teachers with technological, didactic, pedagogical and innovative skills, it is suggested that the MESCYT and the IES reformulate the teacher training policy focus on inclusion, so that it is comprehensive, with quality and equity, while prioritizing innovation as the axis of initial and permanent teacher training; they must also define the characteristics of the curricula of the educational careers in line with the professional profiles defined by the MINERD.

In line with the results, it is confirmed that although teachers have a bachelor ´s degree as a minimum, a transition of the educational system is required to reduce the barriers that exist for the development of educational innovation, especially raising teaching competencies to address the teaching-learning process from an innovative and creative perspective to strengthen inclusive education. It is necessary that the MESCYT and the IES create guidelines for reformulating teacher training policy adapting to these requirements.

Although innovation is a determining factor for promoting scientific, technological development and improving educational quality and inclusion, the level of teacher training determines its effectiveness in the classroom; however, most teachers show ignorance of educational innovation and technological, didactic, pedagogical tools to carry out innovative, creative and inclusive processes. In this sense, a call is made to MINERD, MESCYT, IES and the National Institute of Teacher national institute for teacher education and training (INAFOCAM), to formulate a proposal for incorporating these approaches in initial and permanent teacher training.

The development of a creative and inclusive innovation culture requires policies and procedures that establish appropriate environmental and technological conditions to promote student participation in new production processes, with environments that facilitate student participation and inclusion. In this regard, MINERD must mobilize resources, create, and adapt environmental spaces, physical and technological infrastructure to respond to educational and innovation needs.

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