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Analysis Of The Classroom Practices Of A Novice Teacher Of Natural Sciences At The Popular University Of Cesar

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In this research work, the classroom practices of a practicing teacher of the Universidad Popular del Cesar of the bachelor's degree in Natural Sciences and Environmental Education are analyzed and described. The research is qualitative, focused on a case study of a novice teacher of an Educational Institution in the city of Valledupar, and is developed during the period of time of his professional internships, from the analysis of observation records, interviews and the work carried out by the students, their fellow student and their advisors. The data was constructed from the approaches of three fundamental categories: pedagogical actions, the role of the student and scientific knowledge. (Andrés Muñoz Vásquez & Diego Cardona Restrepo, 2017)

The analysis was mediated by the recognition of limitations in teacher training, their interventions were partial, optimal and they set out to show viable alternatives that would allow their students to include their scientific knowledge from different approaches and forms of evaluation, for the adequate development of skills that favor them in the resolution of different daily problems based on their previous knowledge and that collaborate with the Rescue of knowledge from different alternative traditions that students have manifested in the face of the aforementioned problematic situations. In the teacher's intervention, adaptations are made possible, among which we find, the increase of spaces for inquiry, to allow their students to launch hypotheses, and that from the sample and the previous arguments they initiate a viable alternative for the resolution of impasses.

Keywords: Novice teacher, classroom practices, teaching of natural sciences, pedagogy, didactics.

1. Introduction

Pedagogical mediation has evolved over time, as new theories and postulates about learning have emerged. The first advances took place in the middle of the last century, when currents of constructivism began to take shape, whose bases refer to the postulates of Piaget and Vygotsky, among other eminently-epistemic philosophers (Santiago Bernal Pérez et al., 2017)

From this work, we have been able to approach the various forms of mediation that the teacher can operate in the classroom through an intervention based on conceptual frameworks. With all this, the teacher decides about the fate of the students in the classes that they integrate into their proposals. He states that we as educators are influenced by ideological, distinctive aspects, to obtain appropriate behavior according to the prescribed rules and current paradigms. The weight of the subjects, and within them of the contents, is based on educational beliefs and imaginaries.

2. Theoretical Framework

Education in Natural Sciences seeks to develop favorable attitudes that favor learning, orienting learning towards students, based on their previous experiences and helping to structure and sequence the knowledge they must learn. Natural Sciences are a body of knowledge based on scientific research that integrates knowledge from Physics, Biology, Geology and Chemistry. In this way, the interdisciplinarity of this area of knowledge is also manifested (Refusta Andrés, 2018)

The curriculum of Education in Natural Sciences contributes to achieving the integral formation of the student, because through a holistic and pertinent teaching it allows the appreciation of our environment, the promotion of attitudes of observation, inquiry, experimentation and quantification of any situation in the environment that can be analyzed. With the completion of the class, significant learning can be achieved by the student, who can obtain a multidisciplinary training by relating the previous knowledge and that acquired after actively participating in the class. In this way, the student appropriates knowledge or develops the conception, which in education is defined as a person's concept of a specific phenomenon, which has an extreme influence on meaningful learning and the development of skills, habits and attitudes towards reality.

Taking into account the above, this project seeks to clarify the quality of the educational process in Natural Sciences in order to know the effective development of education in the Institution while obtaining evidence of the factors that influence it. The planning is developed by a new teacher in Natural Sciences who is aware of the importance of these topics and seeks to strengthen her educational process, thus delimiting the work.

2.1. Definition of Natural Sciences

Natural sciences are an area of knowledge whose importance is tangible both in the teaching-learning process and in its application in everyday life, as well as its social context. The importance of science in today's environment can be evidenced from considerations established in educational documents. But what are the natural sciences? The question is not simple, we will discuss this issue in depth.

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In general, a defined concept usually contains a meaning for other disciplines, such as the natural sciences, which are distinguished by having a specific area in their separate scientific research. It is assumed that a set of objects of study are recognized and categorized as natural subjects. Also called sciences of the physical world, the latter term gives us the idea focused on the pursuit of knowledge of it as a system, taking into consideration the natural interrelations of objects and evident phenomena, respecting the connection between experimental work and the planned aspect of this connection.

2.2. Importance of Science Education

Science education is of undeniable importance in teaching, since it allows young people to form certain concepts and a certain vision of the sciences that will necessarily influence their course in these future subjects. Because it is more directly and rationally related to scientific advances, it allows that, with a minimum of notions obtained through the study of a physicist or naturalist, the acquisition of observation habits, research methods, skills to solve practical problems begins, and it can also lay the foundations for education that allow them to more easily acquire and assimilate the scientific advances that are brought to society in such a numerous and varied way through the use of scientific advances. different media: books, conferences, talks, television programs, magazine articles, photographs, graphics, cartoons, drawings, etc. Science education also provides them with data and information that lead them to form appropriate judgments and attitudes towards the natural phenomena that surround us, always seeking their understanding with an optimal search for reality-concept adjustment. (Bertelle et al., 2006)

Science education requires the acquisition of these concepts; radical learning, in the end, of the broadest meaning that can be given to this term; that is, the sense of interpretation not only of the present, but also of the world, of the past and the future, with a minimum educational legacy that translates into fundamental concepts, which the young person must possess and venture with sufficient autonomy, even if he is subjected to correct control by the teacher, to relate, contrast and contrast anything he hears or reads.

2.3. Teaching Methodologies

Teaching is based on different techniques and methodologies depending on the area of knowledge and the educational philosophy adopted by each student. These are integrated into the teaching-learning process and provoke or facilitate meaningful learning. (Miguel Ferrer Bueno et al., 2016)

The method is the way of proceeding that the means follows to reach an end, eclipsing the idea of what is known as "knowing how", giving importance to procedures over contents.

There are several types of methodological organization, which are as follows: teacher's presentation, practical work, theoretical work, free work, integrated projects and explorations. Variations in the content of the presentations will vary, but the basic organization does not change, and the same is true for all other types of organization.

One way to organize knowledge and therefore to teach is through projects. In the following partial we will analyze two forms of work that are Project Work and Project-Based Learning. In both cases, the Torre de Los Vientos of the National Museum of Fine Arts will be taken.

Students should make an effort to stop a little to think carefully about the different stages that involve development. After thoroughly dealing with each stage, the student usually does not notice the passage of time, and feels that time devoured his work and does not point it out, it happens that the result can have different shapes, the cake is equal to what he can give.

3. Description of the Educational Environment

The educational context in which the study is developed is the Prudencia Daza Educational Institution in the city of Valledupar. This public institution was established to serve the members of the female community; However, a few years later, and to provide quality education to a wider population, the institution expanded its access to male students. The academy also has modern environments and an average academic level; It is an educational institution recognized by parents in the city. The aforementioned institution offers basic, secondary and secondary education, which favors the education of students from the neighborhoods on the right bank of the Guatapuri River. The educational institution offers 6 degrees, and operates under the academic modality, with a population of students of low socioeconomic status, according to the institution's admission guidelines. Approximately 750 students make up the secondary school in the afternoon.

3.2. Profile of the New Teacher

This dissertation will focus on the profile of the novice teacher, a concept that refers to those educators who, despite having completed their academic training, are in the early stages of their professional career. These are teachers who have not yet reached a period of three years of teaching practice, going through four significant phases in the development of their pedagogical work: entry, familiarization, adaptation and consolidation. Based on these reflections and emphasizing their performance in front of students, the novice teacher can be conceived as an individual who has completed his or her higher education, but who, with limited experience, is confronted by the reality of the classroom and, sometimes, by the challenges inherent to the profession itself. It is a continuous learning process, where each interaction with students becomes an opportunity to grow and strengthen their educational practice, courageously facing the uncertainties that arise in this path of formation. (Ángeles de las Heras Pérez et al., 2014)

Along the same lines, when addressing the profile of the novice teacher, it is imperative to consider the personal characteristics that promote adequate school performance. In this context, certain qualities emerge that an ideal beginning teacher should possess, which we can reflect in the following adjectives: innovative, sincere, frank, enthusiastic, fair, capable, autonomous, friendly, respectful of colleagues, strong, competent, attractive, creative, playful, loyal, collegial, humorous and tolerant, being an example of professionalism and commitment, as well as a mediator of conflicts. In this way, the importance of soft skills in beginning educators is highlighted, who must become individuals with the ability to learn, adapt, manage

emotions and guide learning processes. Since the novice will also be a model of experience, it is of utmost importance to maintain a balance in their performance in front of students, according to the demands of the educational environment in which they operate.

4. Research Methodology

The approach used for the collection of both quantitative and qualitative information is focused on a non-experimental and descriptive design, it has been selected because it admits the collection of data from different angles, allowing to evidence the characteristics of the study that are intended to be studied and to point out significant parameters that typify them. The type of registration is a simple case, in this case, the profile of a practicing teacher is presented, who is in charge of the Natural Sciences subject for a seventh-year course at the Prudencia Daza Educational Institution.

The educational reality in which the research will be carried out is Valledupar, which is a capital city where scientific research is not frequent. In this sense, the teacher subject of study forms a unit, in which it is of utmost importance to resignify the teaching of natural sciences, since it is considered that it is currently of great importance. Likewise, it is considered of utmost importance that types of inquiries such as projects, ask and investigate about the reality to which it belonged. It will be necessary to make observations to collect a greater amount of information on the case. The observation of practice, so to speak, through the use of didactic methods will lead to the teaching of certain topics so that they will additionally teach the investigative approach of science.

Direct observation is inserted in the number of the protocol, since knowing how the teacher in the classroom considers new situations and them, using activities again is a reason to know things in relation to their usual behaviors. In the same way, it was required that the case be initiated by minimum. The reason why observation was used as a method of obtaining information is that teaching is a practice. Through it, it is expected to have a more contextualized approach to the reality investigated.

4.1. Research Design

In the present research, the methodological framework is qualitative, since it is based on data collection through the use of non-standardized evaluation instruments and does not answer questions that require a statistical analysis. The study or case research type design focuses on a specific experience, verifiable through records through a novice teacher in the area of Natural Sciences. In the classroom context, the teacher worked intensively with the textbook for five hours a week. For its part, the unit to be evaluated was the seventh grade of basic education.

The teacher's lesson plan, consisting of 8 classes and implementation outside the classroom, was used as analysis records to corroborate the activities carried out. In this sense, a ternary methodology would be used in the research classes. For the evaluation of each class, the following records would be considered: Resources used, training and productions. An observational record was used, using a format that contains five dimensions, namely: related to people or objects and context, establishing relationships with each of them, time and activity, inclusion and participation, and reading mediation. In each record to be observed, a total of 20 units would be given, a belt of 20 observation axes for each class observed.

4.2. Data Collection Instruments

This participatory study presents science education as a process of continuous, emerging, delicate and complex construction, which requires adequate tools to scrutinize it in depth in order to generate proposals for adaptation to the reality of the classrooms. Therefore, the methodological design has the following techniques and instruments for data collection, which tend towards a synergistic triad between the observation and critical analysis of the classroom practices of the teacher who has been interviewed, from two collection angles; class diaries and observation logs.

Standard Observation: The accompaniment of a colleague provides the ideal framework to visualize class sessions and simply talk about what has been observed. To this end, a cycle of 6 continuous class sessions of 60 min. duration each of a 14-week internship period was attended, chronologically, in the subject of Philosophy of Science in the morning and afternoon system, which added up to 10 sessions in total. The standard observation technique contains the classroom observation instrument, which is a guideline with dimensions of the environment, interactions and creative capacities. The observation was part of the last level of intervention of a tiered methodology, which integrates observational records of each level before anticipating changes; the programmed schedules as the level of schedules, the effective schedules as the founding phase of diagnostic collection.

Classroom logs, for this purpose it is intended to collect most of the range of qualitative and quantitative records potentially necessary for the scaling of expected results, the information from observed classes is organized, in this sense, the observations are specific to columns of records according to a chronological space and time, if they occur with each other. This information can emerge a priori, a posteriori, through standardized observations such as videographs, it can be emergent or even retrospective.

4.3. Data Analysis

For the analysis of the information obtained, a comprehensive case study was carried out, applying the documentary analysis method for the analysis of the plans, as well as the direct observation analysis method for the analysis of the classes. The observation of the classroom was carried out through the use of a video recording, ensuring privacy and respect for the students in the room. In this way, rights are safeguarded and ethical regulations related to research work in the classroom are complied with.

For the analysis of information, a qualitative approach and a methodology of categorical analysis were used, presenting a methodological approach that implies the development of a cycle of information analysis based on triangulation and reading. In the first cycle, individual reading of documents and observation of classes were carried out. Notes were taken on descriptive, evaluative and interpretative aspects. Subsequently, categorization proposals were generated for the different units of analysis, considering the perspectives of each of the members. Then, systematizations were made of the points that appeared most relevant and that had different visualizations of the phenomenon under study. Finally, the categories that were present in the texts, situations and scenes of greatest relevance to the study were defined.

5. Results

This section presents the results based on three fundamental aspects, which facilitate the understanding of the profile of a novice teacher in training: Description of their classroom practices, perceptions that their students have regarding their performance and in relation to the effectiveness of the teaching strategies used, which accounts for their achievements, in order to have a look at the current state and the possible opportunities for improvement and innovation in a second stage through a sequential design of the research. From the observations made, it was possible to identify 75 teaching acts, differentiating the planning through the use of a planning system and a theoretical record of the objectives to be achieved, both being documents of a macro nature. Two types of acts are shown, the first is the use of tools for didactics and the second is the interaction and relationship with students. The sessions take place on Mondays, Tuesdays and Thursdays, with the sessions with the greatest theoretical coverage predominating in the Monday classes, preferably on missionary subjects and topics. In turn, in the Tuesday classes the application of concepts prevailed, being mixed sessions between the types of collaborative learning, project-based learning and guided propaedeutics and on Thursdays an hour of evaluation with different strategies. Traits of autonomy were identified in the interaction they establish with the group, as well as a range of times, topics and form of development of the session, as a result of being their first practice.

5.1. Description of Classroom Practices

In teaching practice, we assume a mediating facet between the demands of the curriculum and the students, as we use a particular didactics. Teaching is not a neutral activity, at a distance from the philosophies on the active role of the learner, the linking of the contents of an area referenced in the curriculum, trying to promote or homogenize the work that is done to report consensus and identifications. For this reason, in the first chapter, the description of the provincial education system and the appointment of the teacher in particular was made, focusing on the particularities that concern the natural sciences; and subsequently, we analyze what is the methodology used for the teaching of these.

The categorization of classes supported by our observations as a researcher. In the diagnosis, it will try to offer from the information collected the three periods that started from the first day of classes, in the informative talk and the first class, in addition to going through the different vital moments of the practice; such as period exams, the practice of direct observations, the recorded teaching practice not observed as a routine of the week, etc. The purpose of pointing out these moments is to provide the possibility of linking the aforementioned interventions and/or in some cases to discuss the different proposals to separate the link to discuss the interrelation of both practices.

5.2. Students' Perceptions

The instrument categorized as SEM to capture the perceptions of the students shows that they knew the parameter of the activity and eventual delivery of a written work. The synchronized or rectilinear form indicates individual or collective production, since, by learning or forming groups, it could mean. In addition, group deliveries are produced as group products where it says that they are competing. The units of analysis corresponded mostly to the state of activity.

Behind this there is still a certain sense of competition where doubts prevail about the state of the course about a subject. Regarding the concentration and characterization of the distribution units to capture perceptions, both in the categories and variables and in the subcategories also around the corresponding geographical region in part physical. The latter refers to the units of perception and guidance, which are not yet analyzed, which reflects the mutual and orderly sense, which even in the state of production ideas remains extra or not used.

Learning processes give a growth of the human being that is difficult to assimilate according to the implicit celerity, whether in dissemination. This confirms the above as with respect to the effectiveness of the units and the possibility of motivation by both meetings appears at least in the perception of students. This is based on a strong point of the same analysis disposition. Thus, in addition, the inflexible teaching styles of novice teachers seem to be associated with and giving in to delay in a terribly wide margin, but it still works. The units in the best production condition in the guard. When it's encompassing quality within the medium as a base.

5.3. Evaluation of Effectiveness

In the present work, it was proposed to evaluate the effectiveness of classroom practices with technological mediation, using a survey of students and semi-structured interviews with the teachers of the group. The arrival of this new educational context brought with it a new way of thinking about classroom activities; it forced teachers to go beyond academics and attend not only to learning needs, but also to emotional and social needs. Thus, the interviewed teachers agreed on flexibility and attention to students. For their part, the students described their learning experiences during the pandemic according to the traditional educational model. Physical distancing, according to the students, generated a greater sense of abandonment; however, they were able to improve the teacher's communication process in the classroom through virtual platforms, showing receptivity in the use of tools. This shows that the educational community, when implementing ICTs or virtual learning environments, strives to adapt to new challenges and respond to the needs of students. This combination of positions, on the one hand, the students about the spaces of accompaniment by the teacher and the allies they have and, on the other, the self-criticism of the teachers, allows us to glimpse that the practices carried out with virtual learning platforms and the use of ICTs can allow students to learn in the classroom proposed with more significant content.

However, although teachers perceive the feasibility of putting into practice new strategies based on the changes that have occurred in the national educational context, there are still statements that demonstrate a conception of biology in accordance with the postulates of the dominant teaching models of this discipline. For this reason, classroom practices are a mix between innovative strategies and traditional teaching practices. From the perspective of the teachers, in instances of communicative planning, they state that they have been researching and reflecting on the pedagogical strategies carried out in the classroom, through the reading of stories of innovative practices that they later seek to reproduce in their classrooms, indirectly generating an action to change teaching on the one hand, and also an evaluation of what has been achieved in relation to what is thought, desired, or the reality that the students live.

6. Discussion

The objective of this study was to analyze the teaching practices of a novice teacher of Natural Sciences in a private secondary school. From the qualitative analysis of four unstructured and semi-directed classes, the following category was obtained: (1) The study focused on didactic intervention. This appears with three subcategories: (1.1) Nature of the Expected Learning, (1.2) Itinerant Interventions and (1.3) Where classroom contents remain in the background, configuring a "horizon of meaning" where they prevail. From our interpretation, we will try to discuss some implications for initial science training for teachers. This will be dealt with throughout this section.

The path traced by each of the mediating dimensions manifested, gives us indications about the didactics put into play in the classroom and according to intuitions, constructed meanings and experiences lived by the interested party. The researchers see here the first point to strengthen in the initial training of science teachers. As teachers who have had positive experiences maintain, they exercise an intense practice based on daily knowledge and basic knowledge of Didactics, and that disability with which they begin their professional life as teachers can allude to attitudes that are more inclined to slightly, or to the time of development in their future practice towards a different direction from the one experienced. For this reason, initial teacher training should present the opportunity for students to apprehend disjunctive connections that allow them to theoretically articulate experiences, experiences and feelings at the school level and at the extra-curricular level and active subject-in-act, realizer and demiurge.

6.1. Comparison with Previous Studies

The inquiry into innovative alternatives for teaching natural sciences is present in various studies, both nationally and in other countries. The discrepancy between teaching theories and practices, as well as the awareness of situations in which what happens inside the classroom does not conform to what is expected and is evident, is at the core of many of the proposals related to training. Next, the ways in which initial training affects work practices driven by the institutional training profile, motivations and emotions registered by students are mentioned. It is commented that the progression in training statuses is close to scientific activity in relation to proportionality, but this is not the case in relation to the philosophy of science, and for this purpose the validity of teachers starting their teaching in their modules with an encounter of their students with the working methods most frequently used by scientists is also questioned.

Based on the veracity of an initial training that is more concerned with the execution of techniques than with the thinking that governs scientific procedures, it is concluded that as students progress through the program, the instruction they receive about the nature of science becomes progressively more sophisticated. However, we note that this is discussed from the perspective of continuous assessment applied by teachers, facilitators or tutors who record significant processes in their students. Additionally, it is argued that there is a particular growth in the prediction and identification of characteristics or didactic examples included in the guide lessons provided by the students in the diagnostic evaluation carried out at two times during the course. The evidence suggests that there is a temporal integration of the associated prediction between teachers with the characteristics of the phenomenon to be enjoyed.

6.2. Implications for Teacher Training and the Development of Professional Practices of Future Graduates in Science at the UPC.

The information presented in this research may have important theoretical, political, practical, and epistemological implications for the teacher training of those who work in natural sciences classes. From the prism of three classroom practices of the teacher, who was part of the research, we were able to highlight a phenomenon that occurs in the teacher training of novice teachers of natural sciences. The great ignorance they have about practice means that the conceptions they have about the pedagogical task are not discussed in their initial formative journey of those who take their place in the teaching staff, whether rigorist, without developing critical thinking skills, or an alternative position, characterized by critical realism. The pedagogical practice of the future teacher is a field that has not yet been mapped as a whole by processes superior to those of mere imitation, which is almost always very conditioned by those who have carried out their practice by following additional teaching theories such as "mimicry".

From the pedagogical political point of view, initial training contemplates approximately one hemisphere of the curriculum dedicated to the didactic field. However, in our context we find an approximate average of a dozen subjects dedicated to this field. In our opinion, the teaching that derives from these subjects is often mediated by what is called "the premise of the social function of the university", from which universities subsidize from the epistemological point of view what defines their educational work. Thus, "the university cannot feel very pregnant with one theory or another", reproducing ministerial guidelines that tend to standardize, unprotected from a comparative view.

7. Conclusion

In this text, a research was presented about the classrooms of a novice teacher of Natural Sciences of secondary education of an educational institution in Valledupar, directing attention to the type of contextualized pedagogical action; To this end, a qualitative discourse analysis was carried out, based on a type of documentary analysis, of an ethnographic type. The intention was precisely to investigate what are the classroom practices that she teaches in her Natural Sciences course, how she is developing the curriculum from the classroom environment and how she articulates the practice with her beliefs in relation to science, in relation to the teaching and learning of both her discipline from her conception of teacher and the classroom environment.

The pedagogical practices of the teacher practitioner ratify the importance of the environment where the subjects develop; that the scenarios of interaction, both institutional and the intersubjective relations of/between them, have an impact on their actions and on their particular unlimited formations. The educational scenario analyzed recognizes an institutional expectation, that of the transformation of learning from a project-based and research-based Secondary Education articulating the teaching-learning process, forming critical and autonomous students. However, in his day-to-day practices he manages to show his weak thinking to that commitment, developing the system of the educational environment in relation to his voice and that of his students; on the treatment of contents.

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