

# Technological Integration in Primary Education: A Challenge for Teachers Specialized in Specific Disciplines

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This article is part of a larger study carried out in the city of Valledupar, in the department of Cesar, by teachers and students of the Popular University of Cesar, called "Pedagogical practices in primary school: A specific case study" which aimed to propose a series of descriptors around pedagogical practices in the training of teachers in specific areas that help to understand and seek transformation of practices that have become the daily routine of the processes of training teachers of areas in primary educational institutions in the city of Valledupar, in a context of the general problems of education in Colombia. A qualitative research was carried out with foundations of historical-cultural epistemology. Participant observation and interviews were taken as tools for collecting information. The sample is made up of primary, secondary and secondary school students, teachers and educational directors in training. In addition, additional sources of information were used, such as Institutional Educational Projects (IEPs), Area Projects, study plans and programs, teacher texts, internal and external communications, which were taken as documentary sources. This in order to prioritize the multiple representations of education for the different people who experience it.

**Keywords:** Primary education, teacher training, didactic obstacles, pedagogical practices.

## 1. Introduction

This document shows the approach that teacher training programs in specific areas of the primary level have recently adopted, thus becoming innovative, relevant and necessary programs. These programs aim to offer undergraduate students tools that contribute to the improvement of pedagogical practices, which tend to diagnose the problems of Colombian education around the areas, with a view to improving the quality indexes of basic education and reinforcing teacher training at the specialty level. Some knowledge that allows them to be critical, researcher, and innovative within their pedagogical work. That is why the Training of Teachers of specific areas in primary schools in the country is a very important educational

path for the improvement of education in all areas. The inclusion of these is one of the great challenges of education in the country, as long as students at the elementary school level have basic tools to adequately develop the different pedagogical environments.

"Teacher training in Colombia is characterized by being specific in terms of the area for which this teacher is prepared, which is different from the training of a generalist primary education teacher. At the secondary level in Colombia, there was already a split into two distinct groups: humanists and mathematical-physicists." Although the areas of knowledge are separated, specialized schools are not created in them, but only specialties. The university is in charge of training in the specialty that the future teacher wants, but always "the training is done in the same place and under equal conditions.

### 1.1. Context of primary education in Colombia

The academic attention of teacher training programs in specific areas in primary education is in their disciplinary contents and in the development of methodological strategies that allow students in these programs to acquire disciplinary and pedagogical knowledge to teach the curricular areas (language, mathematics, science, technology, social sciences, political constitution, art education, and physical education) of the curriculum according to the reality and context of the country. In the nineties, with Law 115 of 1994 on Social Contracting, the decentralization of the system was proposed and the bases for the participation of the private sector were reinforced, it was proposed to make educational establishments self-managed companies, therefore, there was a great participation in plans, programs, projects and activities. In addition, the minimum quality standards were established, leading to anarchy in education and therefore to low quality.

With the General Education Law 115 of 1994, the processes of institutional, organizational, and curricular reorganization, among many others, began. Throughout 2009 and the beginning of 2010, the National Development Plan 2010-2014 "Educational Project: Building Democracy" was formulated in the context of the MEN and the rectors of public educational institutions. This Plan, which is nourished by the inputs of the AIS by Regions, as well as the theoretical-conceptual proposals made during the last decade, prioritizes as a first priority "to raise the quality of education, through two strategies: To ensure the integral development of children and young people, through diversified pedagogical processes and practices for the formation of citizens". One of the emphases was to enter the world of competitions at school.

## 2. Theoretical framework

The study of the didactics of the areas is vital for the development of the theory of education and pedagogy for two fundamental reasons: (i) because both philosophical reflection and psychological studies participate in its research, and (ii) because it is the basis for the professional training of the teacher. For both reasons, it can be deduced that the problems posed by the constituents of school knowledge have an unavoidable weight for the theory of education and pedagogy, since it will not be possible to resolve the question of its cultural value if a critique of its cognitive and formative characteristics is not first undertaken. And, on the other hand, because from this cognitive and formative nature of the contents derive all the possible didactic consequences that the teacher must bear in mind when facing the task of

teaching a student any of the numerous subjects that make up school knowledge. The development and shaping of the didactics of the specific areas has developed gradually and has brought important benefits to the pedagogical training of teachers at the primary and secondary education level, not only to standardize the areas of research of each discipline within didactics, but also so that from there the areas of research begin to be generated and, with this, new ways of solving teaching problems, which grounds and promotes the organization of research hotbeds with education students from different fields of knowledge in Colombian HEIs.

It is relevant to be clear how mesodidactics and the didactics of the areas generate significant impacts on teacher training, as explained by Malo and Acedo-Margat in their research show that both make up a binomial that contributes indispensably to the process of teacher training, mainly in terms of the planning and management of teaching. In particular, Mesodidactics studies in detail the segment of the teacher's specific science and its relationship with the conceptual field that can be assimilated in general at the student's level. From the general didactics, the orientations it offers may not be sufficiently concrete, varied or appropriate for the teaching of that specific science or have a minimal impact on teaching. Obviously, this figure has a notable formative importance that sweeps the boundaries of the construct, since it indirectly supposes the generation of a new way of applying the unique knowledge of the teacher. Thanks to it, teachers are fully inserted in the process of generating knowledge.

### 2.1. Concept of pedagogical practices

At the same time, to dominate and, on the other hand, as modes of shared participation in social life. Pedagogical practices are social ways of doing, in this case, of teaching, in which the teacher uses a set of resources, techniques and strategies that have been validated as appropriate in a given context.

According to Álvarez et al (2023), there are three levels of specificity at which the pedagogical practices used by teachers can be described and analyzed. The first of these refers to a level of specificity internal to pedagogical practice, such as the specific techniques and methods used when planning and programming teaching and the specific activities and tasks assigned to students. The second level of specificity to which the author refers relates to the interactive processes that are carried out in the classroom between teachers and students and between students, within the framework of strategies, elements that are previously planned and consequently intentional. This section includes routines, that is, the daily regularities that occur in the daily functioning of the classroom. Finally, the third level of specificity refers to the fact that pedagogical practices are not isolated, but, on the contrary, are supported by a series of conceptions, beliefs, intentions and justifications of the teacher.

In general, the practices that are prioritized in the above fields are determined by the disciplines and subjects that make up the curricular platform of the training project.

### 2.2. Importance of pedagogical practices in teacher training

One of the activities of the daily life of human beings is the training of teachers. Over time, they have looked for different ways to learn about a specific task. For Torres (2024), this way of learning has evolved from having only the information provided by the teachers of a normal school, to the possibility of generating different strategies, among which are Pedagogical

Practices, as they are a way of learning by doing in a real environment and typical of the profession. The importance of pedagogical practices in teacher education not only for initial teacher training (FIP), but also for lifelong training, is essential in the literature. One of the objectives of this type of internship is to promote a framework for comprehensive professional development.

In relation to teacher training at the primary education level, there are several theoretical approaches to this area of vocational training. For years, research on primary teacher training has given relevance to practical training for its benefits in professional development. Thus, it is stated that practical training provides knowledge related to decision-making and the development of concepts that require experiences for their acquisition. This practical knowledge is made up of actions and reflections on those actions, which are known as theories of practice. Similarly, the possibilities of inserting teacher training in authentic scenarios offer the opportunity to acquire specific knowledge of the school and, in this way, speed up the incorporation of teachers in the business environment. Hence, the impact exerted on the different educational institutions is greater if the training is, without a doubt, adequate and rooted in their reality.

### **3. Research methodology**

Documentary research. A bibliographic search was carried out of those pedagogies that have contributed to the design of new approaches in the training of teachers in specific areas at the primary school level, as well as the official documents of educational reform aimed at recognizing and strengthening didactics by areas. With these references, a pedagogical training model is designed and proposed for teachers of specific areas at the primary level. According to Neuendorf, it could be said that a content analysis was carried out, given the specificity of the object of study that has to do with the description and analysis of documents in order to inquire about the pedagogical discourses explicitly proposed and that are deployed in the analysis of the same.

Research model. It is recognized that the construction of ideas must be in tune with the possible theoretical references and applied to the object of study. Thus, we proceed to propose the training proposal for teachers of specific areas in their relationship with primary school to make explicit the theoretical, conceptual, procedural, practical and attitudinal path that a training process that has clear pedagogical orientations that dynamically integrate all these aspects of construction of being a grade teacher and area leader must have. Next, reference is made to the components of the research model in order to initiate the descriptive and inferential analysis that sheds light on the possible solution of the problem, the fulfillment of the proposed objectives and the statement of the pertinent recommendations.

#### **3.1. Research design**

This research work is developed with a proposal for women's scientific research on pedagogical practices in the training of teachers in the area of a qualitative type of exploratory nature that will allow us to reconstruct the narratives of different protagonists around this educational action or social practice. It is important to keep in mind the researcher's approach since it helps us to structure research ideas based on conceptual categories and subcategories

that emerge from the investigation of the data and the different generalizations that can be reached about concrete practice. Therefore, this research report will be structured in two large parts: the first is called review of sources, pedagogical concepts, pedagogical models, profile of the area teacher in primary school, teacher training in the area, didactic training in pedagogy as elements that allow some light regarding the interrelationship that is expected between two columns of specific training of the area educator and their progress in terms of the writing of degree theses. In addition, it is based, for many of the works, on readings of the reality of the school as an institution that require continuous thinking about it. We can cite, among others, Furlan (1995), the work of Feldman (1993) who analyzes the position of changing the analysis of the teaching and learning situation to that of training situated in this process of classroom practices.

### 3.2. Sample and data collection techniques

The area of study will be teachers of the basic middle and basic secondary schools who perform guidance functions, either at the secondary level with a workload or, failing that, at the level of basic medium with functions of coordination of human talent but who perform this function of guidance. In the first measure, the population is taken, whose "n" will be around 40 teachers, assigned to a school in the urban area of Cúcuta for each counselor. This "n" expresses the maximum number of subjects to be interviewed, at the same time that it is the number in which the group that regulates guidance in each educational institution is managed.

The techniques to be used will be textual and face-to-face with each of the teachers, with prior authorization from the Secretary of Education and the Salesian Congregation respectively. The interview is a means of obtaining data on the following functions: firstly, it obtains data on the functional relationship between guidance and teaching, complementary sources of information (anamnesis, examinations, tests, etc.) and the elements of justification for the corrective measure (physiological, psychological, pedagogical, etc.). Secondly, through the interview, relevant information is obtained: sources of information to the technician, tests and other methods. Thirdly, the interview provides conceptual guidance on the interaction between guidance and teaching; this conceptual and interpretative movement about the object. Finally, the interview is an important piece of information about each of the guidance functions that, although they have their origin in the students' pieces, are a joint task with the teachers respectively.

## 4. Results and analysis

Pedagogical practices in the training of teachers in specific areas in primary school showed important aspects to be highlighted. University education, aimed at triggering professional training, must provide real spaces that allow the formation of skills, attitudes and habits that allow the future teacher to transform reality in his field of action. The results show a great inconsistency between the theory and practice of teacher training in some aspects, which translates into serious shortcomings in the real teaching and learning processes in the training of teachers in specific areas. This indicates that there is a need to establish dynamic relationships between theory and practice.

How sustained is the role of practices with these logics? What kind of practices are promoted

conceptually and theoretically in our universities? These pedagogical practices currently show methods that manipulate knowledge, generating a subject "of a pamphlet or notebook", superficial in the handling and construction of knowledge. The most common way to establish teaching practices in higher education is school-based practices, which have a fundamentally quantitative approach and are mainly interested in the accreditation of data, its conceptualization and theorization, based on the description and analysis of the different components, elements and variables that occur in practice. At the same time, the leading practices that mark pedagogical training in higher education have led to a boom in the research approach as a mediator of reflection in learning in training contexts.

#### 4.1. Evaluation of the pedagogical practices of teachers in specific areas

Considering that evaluation becomes a means and a process that feeds back and guides teachers to improve their pedagogical practice, allowing them to know their performance for themselves, it is necessary to pay attention to the pedagogical practices of teachers in specific areas in the training of teachers in primary schools, in order to demonstrate their contribution to the development of specific competencies in the teaching and learning process. Thus, it is evident that, although there is a process of evaluation of the teacher, in which the coordinator meets with him to listen to the experiences lived during the month and gives the necessary orientations, not much attention is paid to the characteristics and development of his pedagogical practice by the teacher training institutions.

Finally, teacher evaluation lacks a specific criterion, since it focuses on the overall performance of the teacher and not on his or her specific performance of pedagogical knowledge in his or her disciplinary field, ignoring its specificities and the reality of the classroom, since the primary teacher is the only one in charge of all areas of knowledge from the first to the fifth grade. for this reason, it is essential that the teacher is effective when teaching his students. Returning to the results of the joint diagnosis, it was found that primary school teachers face difficulties in the teaching and learning process in aspects such as the development of deep levels of reasoning in students, for this reason it is sought to identify and describe how teachers import their pedagogical practices for the achievement of specific knowledge in their students related to pedagogical knowledge in the areas of knowledge.

## 5. Discussion

This article provides us with indicators of pedagogical practices that, on a large scale, are not optimally carried out in specific scientific areas. However, in the role of disturbing the academic community with the results of this research, it is aimed at the implementation of initial training proposals for science teachers, with emphasis on the construction of an environment conducive to the development and work of the science teacher.

The training of teachers in specific areas in primary and secondary education is oriented, in all the universities where education is provided in Colombia, to the training of pedagogical professionals. They had a very practical content, which allowed both the methodological component of scientific knowledge and thematic deepening to be addressed. However, since the transition from the training of Higher Teacher Training to Bachelor's Degrees in basic education in 1995, the trend to train pedagogical professionals specialized in their area has



decreased considerably, giving rise to a single-teacher training model, especially in urban areas of the country.

The primary and, in some cases, secondary teachers must make decisions regarding the citizenship education of the school population in their charge in the face of various elements of the educational environment. Basically, initial teacher training programs in the areas of natural sciences and generic competencies are focused on reflection on specific facts or obvious situations (Didactics). This indicates that future teachers need a theoretical and practical framework to deal with the diversity of student learners.

Teacher training is very widespread, both in terms of discipline and pedagogy. Hence, one of the challenges for the education of new pedagogies is that of General Training, but also training as a researcher, as a transforming agent, as a political subject and citizen.

### 5.1. Challenges and opportunities in teacher training

The main challenge of the training of professionals in Colombia, and specifically in education, is to strengthen training in the pedagogical field, because, in initial pedagogical training, greater formative strength is observed in the training of preschool, primary school, and special education teachers than in basic secondary education, based on the studies carried out by Cifuentes (2021) which had as an objective to analyze the learning process of mathematical knowledge in teachers of public elementary schools in the Municipality of Valledupar. In addition, it is noted that substantive aspects of pedagogical training such as the understanding of childhood, the characteristics of students attending to diversity, pedagogical strategies for the school space, laboratories, pedagogical projects, among others; are not assumed in a forceful way from the pedagogical and didactic point of view despite the intentionality manifested in the curriculum of the different education training programs. Likewise, teacher training programs recognize the particularity of the training space in schools located in rural, bilingual, and intercultural contexts, but there is still no evidence of pertinent training in this regard.

In the Colombian context, the challenge is to innovate in initial training through models of integrative pedagogical practices, and the permanent training of teachers. These practices must facilitate the knowledge, understanding and critical reconstruction of their context and, of course, enable them to approach the reality of teachers and learners. According to the MEN, "the diverse variety and texture of pedagogical practices from formal and informal, institutional and non-institutional, international, interdisciplinary, intercultural contexts would be the space for the development of promising and innovative practices." Petscuch (2015), on the other hand, proposes the development of practices in ethno-community and functional scenarios; in institutional scenarios, and in institutional training environments that feed the training of a competent, creative, reflective and enterprising professional.

## 6. Conclusions

Focusing on the reflection on pedagogical practices in the training of teachers of specific areas in primary school in Colombia has undoubtedly been an enriching exercise, becoming the engine for the curricular and disciplinary triangulation of the master's degree, as well as the channel for the research process, especially when unraveling the complex, dynamic and

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diverse of them. This purpose led to the recognition of its evolution in the history of education as a framework for the birth and development of the area, and also as a starting point for the different academic training projects committed to the training role within pedagogical practices.

In this context, it is necessary to strengthen the pedagogical model of diversity, with disciplinary and didactic competencies that respond to heterogeneity and contribute to the formation of values and the development of knowledge. Although the model is coherent with politics and pedagogy, the distances that exist with primary school and the margin of freedom that these spaces have are striking. Similarly, an adjustment of the tools designed for the assessment of the teacher's professional management with the institutional pedagogical model should be used, since there is a very high percentage of students in an insufficient stage when compared to the qualitative results of the report, which shows the little appropriation that the teachers of the institutions make of the pedagogical model. This, together with the lack of appropriation of the model by the graduate, who has not achieved the spaces to be in the institutions.

#### 6.1. Recommendations for the improvement of pedagogical practices in primary schools

According to the results of this research, the need to improve pedagogical practices in primary school in different ways was evidenced, as mentioned above. One of them is related to the construction and dissemination of knowledge around the practices of mathematics education and science education in specialized curricular elements for primary school teachers. These types of practices are relevant and important to understand what are the pedagogical components around disciplinary knowledge and which practices enrich the teaching-learning processes in the two disciplines mentioned, in addition to their interlocution with the school and the scarce existence of spaces such as material laboratories that favor the proposal and discussion of knowledge in process. The attempt is then for the school to promote useful general knowledge in the form of abstract discourses and models. Likewise, patterns of transmission of knowledge from teachers to students are identified.

Another aspect in which it is necessary to advance is the generation of academically and socially relevant postgraduate programs for the training of teachers of both disciplines at the primary school level. It is necessary for teachers in training to have spaces to review and reflect on disciplinary and pedagogical aspects, not only theoretically but also practically. These programs must seek to provide future teachers with this knowledge. In addition, these programs must be strategically articulated with the country's educational policies and must provide spaces and policies for teachers in training to carry out internships prior to their degree.

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