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Studia paedagogica. 2021, vol. 26, iss. 2, pp. [139]-163

ISSN 1803-7437 (print); ISSN 2336-4521 (online)

Stable URL (DOI): <https://doi.org/10.5817/SP2021-2-7>

Stable URL (handle): <https://hdl.handle.net/11222.digilib/143975>

Access Date: 23. 02. 2024

Version: 20220831

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INFLUENCES OF EDUCATIONAL POLICY ON THE PRE-SERVICE EDUCATION OF TEACHERS IN SCIENCE AND ENVIRONMENTAL EDUCATION: A LATIN AMERICAN CONTEXT

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Abstract

This study aims to recognize which political guidelines operate at the educational level and influence the pre-service education of teachers in science and environmental education. The research question concerns which political discourses influence the curriculum of the pre-service education of teachers in science and environmental education in Colombia. To address this question, we conducted exploratory research regarding educational policies from 1886 to 2017; these consisted of eight laws, nineteen decrees, and eight resolutions. Additionally, we made use of the document of the Colombian System of Educator Education and Policy Guidelines. Finally, in the Universidad del Valle, we studied five resolutions that guided the pre-service education of teachers in science education from 2002 to 2017. In our introduction, we discuss a range of theoretical influences, such as of the World Bank and Western European thought, in education policy discourses that are subsequently supported by the results of our research. Our findings help to understand how scientific and environmental education knowledge could, in response to the educational policy, co-exist or compete with each other for placement.

Keywords

policy discourses, power relationships, environmental education, science education, pre-service teacher education

Introduction

We begin by identifying the role and the level of recognition that scientific knowledge has compared with other domains of study and knowledge, such as pedagogy, that influence the processes of the pre-service education of teachers. This identification starts with the division of responsibilities between the education and science faculties, moves on to the relationship between the state and science (Feyerabend, 1970), as in the financing of research projects, and further progresses to the creation and publication of public policies that guide educational processes. Policies can generate social and cultural coercion that lead education to be a part of and a response to “public sector discourses of excellence, effectiveness and quality and the logic of the culture of new managerialism” (Ball, 2006, p.12) where education is favored and is motivated to be better and produce quality and to generate efficiency and effectiveness, ultimately generating a competitive profession and not collective work (Ball, 2006; Höfling de Mattos, 2001). However, despite the fact that the guidelines established by public policy on education have an impact on daily practice, we note that the actual execution of these practices depends on the questioning and critical thinking of individual teachers as well as universities in such a way that education can influence social transformation.

In certain cases, we found similarities between European and Latin American research regarding how the scientific component is granted a higher status in undergraduate careers, and given greater power over the pedagogical, didactic, and environmental education (EE) components, thus generating, in some cases, a subordination that is unconscious and uncritical of hegemonic positions and that would directly influence the processes of the pre-service education of teachers. This could result in the generation of a worldview characterized by the instrumentalization, verification, and devaluation of knowledge other than scientific knowledge. It is, in fact, a consequence of the globalization of ideologies; according to Jicking and Wals (2008) “the powerful wave of neo-liberalism rolling over the planet, with pleas for ‘market solutions’ to educational problems and universal quality-assurance schemes, are homogenizing the educational landscape” (p. 2).

In addition, the European perspective recognizes how the World Bank is influencing international research agendas and educational policies. The curricula of many educational programs are being changed in response to demands to better prepare individuals to join local labor markets, such as in Europe, where they have implemented higher education reforms in

accordance with the Bologna Process.¹ Part of the decision-making regarding the development of new study programs and reforms is made by the internal academic structures of higher education institutions; however, governments are also involved in decision-making (Eurydice, 2018).

It is not surprising that this kind of reform finds its way to Latin America. Countries such as Colombia create and implement educational policies inspired by European, North American, and global initiatives. Programs in science education (SE) and EE can hardly escape this reality. Taking this into consideration, we focused on the “Bachelor in Basic Education with an Emphasis in Natural Sciences and Environmental Education” (BBEENSEE) program offered by the Universidad del Valle. The program’s curriculum was reformed in such a way that the EE component was reduced in order to accommodate other components of the course; this was despite its being a program that is supposed to have an emphasis in EE, thus reinforcing the necessity of educational policy in Colombia. According to Ball (2015), political discourses can be constructed, reordered, displaced, reconstructed, fulfilled, and standardized. Hence it can be analyzed in terms of its cycle. The policy cycle is made up of three interrelated contexts. The first is the context of influence, in which policies and discourses are initiated and constructed; the second is the context of text production, expressed in the language of public interest and materialized in legal political texts; the third is the context of practice, a scenario in which politics are subject to interpretation and re-creation, producing effects and consequences, changes and transformations (Ball & Bowe, 1992).

As part of this special issue on “Interactions and Meanings in Social Networks,” our intention is to contribute to research and policy through our analysis and to provide the opportunity to understand which political guidelines operate at the educational level and influence the pre-service education of teachers in science and EE. This will subsequently allow the recognition of how discursive practices of political and institutional subjects influence the construction of discourses during pre-service education. However, in this article, we will not be developing this last objective. This article discusses and includes part of a previous study made by Mejía-Cáceres (2019) and Mejía-Cáceres et al., (2021).

In addition, we rely on the understanding of discourse (spoken or written) advanced by Fairclough (2008) as a moment of social practice; meaning that it is a mode of action, located historically and socially as well as socially constituted and socially constitutive of social identities, social relations, and

¹ According to Kushnir (2016, p. 665), “the Bologna Process has had an impact on higher education systems in other parts of the world.”

knowledge and belief systems, so that it is also a practice of the significance of the world. Therefore, in critical discourse analysis, this understanding proposes the explanatory criticism of societies and institutions and their discursive practices that coexist, contrast, and compete with each other (Fairclough, 2008).

Taking into account these concepts, to identify the political orientations, discourses, and hegemonic scenarios² that influence the process of the pre-service education of teachers, one question leads us through this article: Which political discourses influence the curriculum of pre-service teacher education in science and EE in Colombia?

Pre-service education of teachers in Colombia: understanding the context

Education in Colombia is guided by the general education Law 115 of 1994 (República de Colombia, 1994), which establishes educational purposes as well as structures the educational system, including formal education such as that provided by approved educational establishments.

This same law establishes that the pre-service education of teachers will be exercised by universities, other institutions of higher education that have a faculty of education or another unit dedicated to education, and normal schools for the pre-service education of teachers. The pre-service education of teachers in the field of SE in Colombia, which falls under the responsibility of the universities, occurs through degrees considered professional by the Ministry of National Education of Colombia. In 2015, according to the National Information System for Higher Education (SNIES), there were five types of bachelor's degrees; however, during the development of this research, the new Resolution 02041 of 2016 arose in which the only degree that has EE in its name is the Degree in Natural Sciences and Environmental Education, which generated a whole curricular restructuring (addressed in our analysis), although degrees in natural sciences, physics, chemistry, and biology are also among the compulsory and fundamental area of natural sciences and EE.

² Meaning scenarios such as the conception of knowledge, science status, pedagogic and didactic strategies, and other scenarios that can be more powerful and that can control other sciences, conceptions, and educative strategies.

An academic debate on the implementation of public policies in curricula has been motivated by curricular reforms and changes (Bordin, 2015; Lopes, 2004). Vilanova (2015) confirmed that the typical communication strategy of reforms is one of rupture. However, many investigations are carried out in order to understand the relevance (Lähdemäki, 2019; Wales et al., 2016) and the application (Berdugo & Montaña, 2017; Serbănescu, 2013; Symeonidis, 2017) of these policies, disregarding the discursive aspects that guide the policies themselves (Mejía-Cáceres et al., 2021), linking them to certain societal interests and projects. Perry et al. (2010) explained that

In some areas, policy has been soundly based on evidence of success, and confirmed by later evaluation. In a number of other areas, however, we have been shown examples of policies that are either flimsily evidenced, or actually counter-indicated. Worse, serious studies that cast doubt on the effectiveness of an aspect of policy are swiftly dismissed or attacked (p. 7).

In this research, we work with the guidelines that influence the BBEENSEE from the Universidad del Valle. It is important to clarify that although the different bachelor's programs have the same name in various universities, each degree has its own curriculum.

The BBEENSEE was organized by five elements: the basic subjects, professional subjects, complementary electives, professional electives, and compulsory law subjects. The basic and professional subjects are grouped into four components: socio-environmental knowledge, scientific knowledge, pedagogical knowledge, and didactic knowledge. In this sense, the basic subject for the socio-environmental component is general ecology, and the professional subjects within this component are history and EE, landscape culture, environmental problems I, environmental problems II, education and sustainable development, and school environmental projects. To pass the program, students must complete a monograph that must be articulated with any of the curricular components and therefore with the lines of research.

Mejía-Cáceres (2019) found that in the Colombian context, EE is viewed in relation to SE, which is shown in the approaches of the bachelor's degrees of natural sciences, biology, and chemistry. This characteristic is more of a response to interest in science didactics, in which the environment is a topic that allows students to generate interest in science from a social and ethical perspective of scientific activity (Sauvé, 2005).

We consider EE to be more than the natural sciences, and incorporates other areas of knowledge, such as economy, politics, and ethic, as well as the practical knowledge and traditional knowledge of the communities. In this sense, EE would broaden the notion of SE.

Consequently, we recognize new elements of study and discussion within EE, such as the question of power, which appears in the different dimensions of the social structure as part of the capitalist system but also in appropriation strategies of knowledge. This last aspect can be studied within the teacher's pre-service education processes, through the identification of knowledge systems, cognitive strategies, forms of justification, validation, and verification with reality, motivations, and interests, since these will influence social transformation and the appropriation of nature (Leff, 2006).

In this sense, assuming the existence of the articulation between SE and EE, we must understand SE as a space for reflection so that teachers in pre-service education think about the objectivity of science and about different issues that are part of the scientific knowledge production process, including personal, political, social, and economic issues, as well as the influence of social networks.

Science education and environmental education: Are they different fields of research?

Considering that our context of study is a bachelor's degree in science and environmental education, it is necessary to open the debate on SE and EE as research fields. We clarify that the object of our investigation is not one field or the other; here, we present the discussion between the fields in order to understand the context in which the degree is immersed, which could influence the manner of translating and interpreting the policy.

In this case, SE is a recognized field based on SE research. Willard (1971, as cited in Fensham, 2004) explained that:

Science education research is the systematic attempt to define and investigate problems involved in the learning and instruction in science. It is desirable that the research be cumulative so that investigation builds on the research of others. Hopefully, research will also influence practice. These digests are designed to serve as a guide to reports of science education research and to make the result of research more readily available (p. 12).

SE as an academic discipline was a consequence of the projects for curriculum development that were launched in the United States and Britain at the end of the 1950s, the SE developed in those countries influences other countries and has an impact on the character and quality of school science teaching and learning (Fensham, 2004). With time, the field changed to include social theory, moving towards cultural theory, cognitive science, psychology, and others.

In Colombia, a group of researchers studied the epistemological status of SE research offered in the country between 2000 and 2011, establishing as research lines:

The relationship between scientific knowledge and common knowledge; the teaching, learning and evaluation (metacognition and conceptual change, solving problems, and history of sciences); the relation between theory and practice in experimental sciences through the school lab; the technologies of information and communication; curricular development; cultural context, environmental education, and science education in unconventional environments; knowledge, belief and education of the teachers (Zambrano et al., 2013, p. 78).

In this context, it was necessary to study research about the pre-service education of teachers in connection with EE from a critical perspective. We noted fewer research resources in Europe than in Latin America. In Europe, we found authors such as Bonnett (2013), Reid (2003), and Wals et al. (2014) who debate the relationship between EE and SE; and Bonnett (2007), Jickling and Wals (2008), Novo (2009), and Scott (2013) who critically discuss EE policy. In Latin America, specifically in Brazil, we found a larger volume of critical research on EE (Andrade et al., 2012; Carvalho et al., 2009; Giuffré et al., 2007; Gonzáles-Gaudio & Arias Ortega, 2014; Loureiro, 2006; Marcos, 2012; Mejía-Cáceres et al., 2018; Sorrentino et al., 2005; Tristão, 2013).

Mejía-Cáceres (2019) identified two types of relationships; the first is of inclusion, which is defined by the fact that one field surrounds another, that is, it includes the other. A common finding is that EE is considered immersed in SE, and not vice versa. The objective of this relationship is dissemination, popularization, and scientific literacy, in addition to generating interest in science. The means of putting this inclusion into practice are through the use of socio-environmental issues in SE processes, as well as in specific disciplines. So, SE is considered an EE practice field. The second relationship is of association, in which the basis of the relationship is independence, being able to generate an emerging field. In this sense, EE interacts with SE as two different fields of study, but the ultimate goal is the exercise of citizenship. The means of practicing this association are by approaching the scientific contents in their socio-environmental context, as well as the use of integrating axes such as knowledge, ethics, and politics. On the other hand, it is considered that although EE and SE are different fields, in which one can influence the other, for some authors (Chambers, 2008; Guimarães & Vasconcellos, 2006) EE is based on the scientific paradigm.

These disagreements between SE and EE as a field have generated a fundamental gap. According to de Vries and Pieters (2007, as cited in Vanderlinde & Van Braak, 2010), this fundamental gap reflects differences in opinion about the nature of knowledge and theory, vocabulary, and reward systems, resulting in a practical gap that impacts political issues, the collaboration of organizational boundaries, the allocation of time and resources, and authority issues.

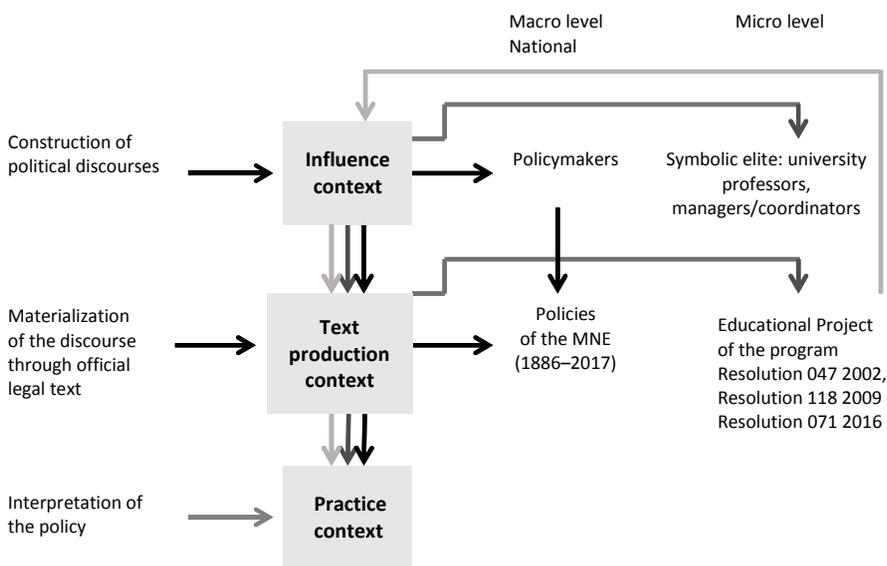
Another point that needs to be highlighted is the difference between the fields of research and practice. Policy is close to the field of practice. The discussion of the influence of policy on pre-service education also falls within the field of practice. However, this field as social practice communicates with other dimensions of society.

Research methodology

This study was conducted using qualitative methodology considering that it is composed of different components (research question, methods, context frame, goals, and validity) that structured our decisions (Borda & Güelman, 2017). We also used the critical analysis discourse as a theoretical and methodological perspective. Furthermore, this perspective was linked with the policy cycle proposed by Ball. The first stage aims to identify the educational policy guidelines used in the bachelor's degree. In order to do this, we reviewed official texts from 1886 to 2017 including laws, decrees, and resolutions on the pre-service education of teachers. Finally, we reviewed the policies enacted by the University del Valle.

Figure 1 shows that the power groups within the Colombian social structure depending on the pre-service teacher education have different roles in different contexts. At the macro level are the policymakers who are influential in the construction of texts, such as resolutions, laws, and decrees approved by the Ministry of National Education (MNE). After being approved and promulgated in the context of production, this policy is subject to interpretation by another social group: the symbolic elite represented by university professors, who sometimes change their role to assume the direction or administration in the collegiate bodies of the universities, in this way having influence in the compliance with the regulations of the MNE. In addition to participating in the context of practice of the texts of the MNE, these become a context of influence by producing the texts that will guide the degree at the micro level, for example, in the educational projection of the program. In turn, these texts are influenced by the context of practice, which we analyzed elsewhere by interviewing teachers and analyzing monographs. However, this article focuses on the analysis of the policy.

Figure 1
Cycle of politics of the degree



Source: Mejía-Cáceres (2019), adapted from Ball (1992, 1994)

Although we organize the methodological procedure in two sub-stages, we want to clarify that the practice context is present in the two stages (it does not correspond to a linear process); therefore, they have direct relationships.

These sub-stages refer to the context of influence, that is, to the stage where political discourses are constructed. For data collection, a bibliographic review was made of the laws, decrees, and resolutions of Colombia on the pre-service education of teachers. For the analysis of the context of influence, the concept of context by Van Dijk (2012) was assumed, establishing that, at the general level, the political social domain will be addressed; at the higher level, collective control (laws, politics, administration) will be addressed; and at the lower level, the control of actions. The categories used are:

- Global action: begins by establishing the communicative event, which will be related to collective control, that is, laws, decrees, and resolutions created by the Ministry; accompanied by the date, place and function/intention of the communicative event.
- Global participants: the actors, their roles, professions, and the circumstances of their participation and political ideology.

Once the above categories have been identified, it is possible to have a better understanding and interpretation of why and for what purpose the texts are produced. Subsequently, the focus was shifted to the text production context, which is materialized through official legal texts on the pre-service education of teachers and EE.

Sub-stage political orientations on pre-service teacher education and EE

In order to identify the political guidelines, we conducted exploratory research about educational policy in the pre-service education of teachers and EE in Colombia. According to Sampieri et al. (2006), descriptive studies are useful for analyzing types of phenomena, how a phenomenon is manifested, and the components of a phenomenon.

To collect data on pre-service teacher education, a description was made of the texts of the laws, decrees, and resolutions related to pre-service teacher education established by the MNE of Colombia between 1886 and 2017; these consisted of eight laws, nineteen decrees, and eight resolutions about pre-service teacher education. Additionally, we made use of the document of the Colombian System of Educator Education and Policy Guidelines. Finally, in the Universidad del Valle, we studied five resolutions that guided the pre-service education process for teachers of SE from 2002 to 2017.

Table 1

Laws on the pre-service education of teachers in Colombia

Law	Declares that	Government representative
Law 10 1880	Foreign secretary change	No available information
Law 0007 of 1886 (August 25th)	Number, nomenclature, and precedence of the Executive Office Ministries	J. M. Campo Serrano Aristides Calderón
Law 0056 of 1927 (November 10)	Provisions on public instruction	Emilio Robledo Marqu�ez C. Julio D. Portocarrero Fernando Restrepo Brice�o Miguel Abad�a M�endez J. Vicente Huetas
Law 62 of 1916 (December 12)	Promotion of some pedagogical corporations	Jorge Roa R. Quijano G�omez Julio D. Portocarrero Fernando Restrepo Brice�o Jos� Vicente Concha Emilio Ferrero
Law 25 of 1917 (November 6)	National Pedagogical Institutes	Jorge Holgu�n Luis Cuervo M�rquez Julio D. Portocarrero Fernando Restrepo Brice�o Jos� Vicente Concha Emilio Ferrero
Law 71 of 1922 (November 14)	Convention on the exchange of teachers and students on the equivalence of academic qualifications between the Republic of Colombia and the Eastern Republic of Uruguay	Ismael J. Insignares Gerardo Arias Mej�a Julio D. Portocarrero Fernando Restrepo Brice�o Pedro Nel Ospina Jorge Velez
Law 24 1976 (September 13)	Exercise of the profession of graduates in education science, in their different specialties	Alfonso L�pez Michelsen, Hernando Dur�n Dussan
Law 115 of 1994 (February 8)	General Education Law	Cesar Gaviria Trujillo H�ctor Jos� Cadena Clavijo Maruja Pach�n

Source: Mej a-C ceres (2019)

Table 2

Decrees on teacher pre-service education of teachers in Colombia

Decree	Declares that	Government representative
Decree 1238 of 1892 (January 1st)	The National University	Carlos Holguín José Trujillo
Decree 1047 of 1912 (November 29)	Conditions for issuing the title of Professor	Carlos E. Restrepo Cuervo Márquez
Decree 670 of 1912 (June 25)	Provisions on Normal Schools	Carlos E. Restrepo Cuervo Márquez
Decree 1605 of 1930 (September 27)	Amendments to Some Provisions on Normal Schools	Enrique Olaya Herrera Abel Carbonell
Decree 10 of 1932 (January 7)	Provisions on Departmental Normal Schools and the Faculty of Education is created	Enrique Olaya Herrera Julio Carrizosa V.
Decree 0533 of 1938 (March 21)	The curriculum for normal studies is established and other provisions are given	Alfonso López José Joaquín Castro M.
Decree 77 of 1943 (January 18)	Provisions on Normal Schools	Alfonso López Arcesio Londoño Palacio
Decree 936 of 1945 (April 13)	Modification of number 77 of 1943 and other provisions are given	Alfonso López Antonio Rocha
Decree 1426 of 1961 (June 28)	Equivalence of the certificates of the National Institute of education and improvement of the Primary Education Teaching for the purposes of the respective level	Alberto Lleras Alfonso Ocampo Londoño
Decree 2188 of 1962 (August 2nd)	Transformation of the name to the Women's Pedagogical University of Bogotá and other provisions are given	Alberto Lleras Jorge Mejía Palacio Jaime Posada
Decree 1955 of 1963 (September 2)	Reorganization of normal education	Guillermo León Valencia Pedro Gómez Valderrama

Decree 1883 of 1963	Repeals article 6 of Decree number 2188 of 1962, regulates the operation of the National Institute of education and Improvement of the Primary Teaching Magisterium, and other provisions are given	Guillermo León Valencia Pedro Gómez Valderrama
Decree 1964 of 1969 (November 20)	Authorization of higher education institutions to organize short and medium-term courses in educational sciences	Carlos Lleras Restrepo Octavio Arizmendi Posada
Decree 1348 of 1990 (June 27)	Creation of the Special Teacher education System and other provisions are given	Virgilio Barco Manuel Francisco Becerra Bersey Luis Fernando Alarcón Mantilla
Decree 1860 1994 (August 3)	Law 115 of 1994 is partially regulated in general pedagogical and organizational aspects	Cesar Gaviria Trujillo Maruja Pachón
Decree 1743, 1994 (August 3)	The environmental education project is instituted for all levels of formal education, giving criteria for the promotion of non-formal and informal environmental education	Cesar Gaviria Trujillo Maruja Pachón Manuel Rodríguez Rafael Pardo
Decree 180 of 1997	Modification of decree 1869 of 1994	Ernesto Samper Pizano Jaime Niño Diez
Decree 5012 of 2009	Transformation of the Structure of the Ministry of National Education	Oscar Iván Zuluaga Isabel Segovia Ospina Elizabeth Rodríguez
Decree 1075 of 2015	The Single Regulatory Decree of the Education Sector	Juan Manuel Santos Calderón Gina Parody

Source: Mejía-Cáceres (2019)

Table 3
Resolutions on pre-service education of teachers in Colombia

Resolutions	Declares that	Government representative
Resolution 1036 of 2004	Specific quality characteristics for graduation and specialization programs in education	Cecilia María Vélez
Resolution 5443 of 2010	Specific characteristics of quality for professional formation programs in education within the framework of quality conditions	Cecilia María Vélez
Resolution 6966 of 2010	Specific characteristics of quality for professional formation courses in education	Cecilia María Vélez
Resolution 2041 of 2016	Specific characteristics of the quality of the bachelor's programs for obtaining, renewing, or modifying the qualified registry	Gina Parody
Resolution 18583 of 2017	The specific quality characteristics of the bachelor's programs are adjusted to obtain, renew, or modify the qualified registry, and Resolution 2041 of 2016 is repealed	Yaneth Giha Tovar
Resolution 25113 of 2017	The request for renewal and modification of the qualified registry of the Bachelor of Basic Education with an Emphasis in Natural Sciences and Environmental Education of the Universidad del Valle, offered under the face-to-face methodology in Cali (Valle del Cauca) is resolved	Natalia Ruiz Rodgers
Resolution 10715 of 2017	The request for High Quality Accreditation of the Bachelor of Basic Education with an Emphasis on Natural Sciences and Environmental Education of the Universidad del Valle, offered under the presence methodology in Cali- Valle del Cauca, is resolved	Yaneth Giha Tovar
Resolution 10261 of 2018	Resolution number 10715 of May 25, 2017 is modified	Yaneth Giha Tovar

Source: Mejía-Cáceres (2019)

A description was provided of the documents produced within the Universidad del Valle that guide the pre-service education of science teachers between 2002 and 2017. Consequently, in the corpus of study of the texts produced at the micro level, we find:

Table 4

Resolutions on the BBEENSEE program of the Universidad del Valle.

Resolution	Declares that	Government representative
Resolution 047 of 2002	The BBEENSEE is defined	The Academic Council
Resolution 118 of 2009	The curricular structure of the BBEENSEE program is modified and updated	Approved by Academic Council Resolution 47 of 2002
Resolution 071 of 2016	The name of the Universidad del Valle program is modified, issued by the Academic Council, by which it is modified as Bachelor in Natural Science and Environmental Education (BNSEE)	The Academic Council
Resolution 095 of 2017	Resolution 118 of 2009, which defines the curriculum, is modified and the name of the BBEENSEE program is changed to BNSEE	The Academic Council
Resolution 053 of 2017	Resolution 118 of 2009 of the Academic Council that defined the curricular structure of the Academic Program BBEENSEE and Physics is modified and the curricular structure of the Academic Program BNSEE is approved	The Academic Council

Findings

Public policy related to the pre-service education of teachers in sciences and environmental education in Colombia

In order to understand the impact of public policy, we consider the premise that policies after 1988 were considered influential in everyday practice and those prior to this date were believed to have little impact (Power, 1992 as cited in Ball, 2006). From 1800 to 1900, there was only one decree regarding the pre-service education of teachers; in this period of time there was no clear public policy. Only in 1892 is there recognition of the program “Professor in Natural Sciences” by decree 1238 article 20, which was offered by the National University within the Professional University Faculty (República de Colombia, 1892). It is important to note that it does not express its characteristics or the guidelines to be followed by the institutions. The lack of interest in educational processes is understandable since at the time the main objective of President Carlos Holguín of the conservative party was to regain political power by generating a conservative hegemony for 44 years.

EE was cited for the first time at the educational policy level through Decree 1743 of 1994 (Ministry of National Education, 1994) and the school environmental project (PRAE) was institutionalized, establishing a framework for environmental, local, regional, and national diagnoses for all levels of formal education, both private and public, and building relationships between the ministries of education and the environment.

It subsequently established its guiding principles, by which EE must respond to the principles of interculturality, formation of values, regionalization, interdisciplinarity, participation, education for democracy, management, and problem solving, in addition to being present in all components of the curriculum. To achieve the objectives described above, the ministry and the secretaries of education must design and implement continuing teacher education programs, in addition to undergraduate education, and incorporate the national EE policy (Ministry of National Education, 1994).

The responsibility of the educational community was also instituted, in which the teachers of a certain area are responsible not only for the construction and implementation of the PRAE:

Students, parents, teachers and the educational community in general have a shared responsibility in the design and development of the School Environmental Project. This responsibility will be exercised through the different organs of the School Government. In addition, educational establishments will coordinate their actions and seek advice and support from higher education institutions and other public and private organizations located in the locality or region (Ministry of National Education, 1994).

In the second chapter, they established the instruments for the development of the PRAE, the advice and institutional support, the permanent evaluation, the compulsory social service, the compulsory military service in EE, and the pre-service education of teachers. In the third chapter, they made references to inter-institutional and inter-sector relations through participation in the National Environmental System, dissemination and promotion strategies, inter-institutional technical committees on EE, territorial participation, relations with the boards of education, progress in environmental material from recognized institutes, advice and coordination in the EE area, ending with the environmental information system, execution of the National Policy of Environmental Education of Colombia (NPEEC), and project financing.

The NPEEC does not have an item dedicated to EE teacher education; however, it does refer to it:

The organization of education programs for university professors in those issues considered fundamental in the environmental field is essential; preferably programs of an unschooling nature in order to achieve a true

contextualization as far as the particular environmental problem is concerned. These programs can be led by universities that are committed to developing them within quality parameters (strengths both in the Environmental concept and in the Educational concept and particularly in Environmental Education, strengths in the field of Research, strengths in projection work and significant theoretical production) to achieve the required impacts. This education must cover the needs of all disciplines and areas of knowledge which have to do with environmental issues and management (Ministry of Environment & Ministry of National Education, 2002).

In this sense, there is a contradiction between the NPEEC and practice, since the pre-service education of teachers is being given mainly through degrees, especially associated with natural sciences although the NPEEC does not establish a favored area of knowledge for education in EE but refers to education in general.

In consequence, one controversial and often ignored situation in the educational process is the government's establishment of hegemonic relationships through public regulations and the centralization of decisions such as the way forward for the universities responsible for teacher training. To strengthen the connections between government and education, some researchers have argued the ideological and structural contradiction of educational policies (Grace, 1995, as cited in Ball, 2006). In identifying educational policies as contradictory, policies on the pre-service education of teachers do not take into account policies on EE. In examining this argument, we find how the Ministry of Education in Colombia included and associated EE with a natural perspective. In other words, EE was suspended and omitted from bachelor's degrees in other fields such as mathematics, history, and chemistry, although the NPEEC affirms that EE needs to be present in all fields. We find a concrete example of this contradiction in Resolution 02041 of 2016, which sets the names of Colombia's bachelor's degrees programs. Another contradiction is seen in the obligation to include EE in educational institutions without any policy on pre-service education in this domain. The state demands that it be implemented but does not make provisions for pre-service education in EE.

We recognize the impact of public policy in the educative process. It is necessary to understand the historic context of public policy that affects current decisions about education, and specifically the "autonomy" of the universities. Although the state establishes that there is university autonomy,

The political constitution will guarantee university autonomy, developed in articles 29 and 29 of Law 30 of 1992, recognizing the right of higher education institutions to:

Give and modify the statute, designate academic and administrative authorities, create, organize and develop academic programs, define and organize formation,

academic, educational, scientific and cultural work, give the corresponding titles, select teachers, admit students and adopt regimes, establish, arbitrate and apply the resources for the fulfillment of the social mission and the institutional function (República de Colombia, 1992).

We highlight autonomy because it is clear that the educative process is established by the Ministry of Education. It formulates guidelines that teacher training needs to have regarding curriculum, pedagogy, didactic content, and basic competency or standards, in Decree 2082 of 1996 (República de Colombia, 1996a), Resolution 2041 of 2016 (Ministry of National Education, 2016), and Resolution 5443 of 2010 (Ministry of National Education, 2010); it assigns the responsibility of teacher training to universities and normal schools in Decree 670 of 1912 (República de Colombia, 1912) and Decree 0709 of 1996 (República de Colombia, 1996b). However, despite the guidelines, universities have relative autonomy to design their curriculums. Another consequence of globalization is that education is made and measured with basic competency and standards. The result has been the reduction of education to a homogenous, mechanical, instrumentalized practice that prioritizes market-driven competition. Besides, for the most part, policymakers ignored research findings and academic suggestions in the field of education, as well as those in the field of the environment. As Ball (2006) affirmed, “they are not captured by assumptions and inscriptions of policymakers” (p. 25).

Political guidelines conveyed a certain standardization of education regarding the position of Colombian education in response to international and specifically North American influence. An example of this was found in an instructional design from 1922 (Law 71) (República de Colombia, 1922), which proposed cultural exchange as part of the pre-service education of teachers. We considered it an important dimension; however, we found it was in response to United States requirements, not a consequence of local initiatives or necessities. It is, perhaps, not a coincidence that some governments have low political autonomy over their country, but it reinforces the idea that some Latin American countries responded in favor of international interests, leaving aside local and cultural needs. According to Mainardes (2006), this is a consequence of the dialectical interaction between global and local policies.

Colombian law is associated with international requirements. UNESCO (2005) puts an emphasis on quality education in their report which reiterated the World Declaration on Education for All. The report identifies quality as a prerequisite for achieving the fundamental goal of equity and helps to increase children’s cognitive development. Therefore, it is considered to be “at the heart of education” (UNESCO, 2005). We argue that quality is associated with the efficacy of implementation or the influence of educational reforms that are forms of the recolonization of European

hegemony, materialized now through the Bologna Process. In Colombia, the concept of quality is articulated through the accreditation processes, which are not only raised through legislation (resolutions, decrees, and laws), but also through the Colombian System of Education for Educators and Policy Guidelines (SCFELP).

The SCFELP also guides the educational process for teachers, such as the profile of the educator in initial education that points to education for participation:

Another of the characteristics of the profile of the educator of this subsystem is based on the formation of political subjects who empower, self-determine and organize in groups that promote quality education for Colombia, with a deep formation and cultivation of moral conditions, in ethics and bioethics, as well as democracy and citizenship (República de Colombia & Ministry of National Education, 2013, p. 75).

The concept of quality is prioritized, as is articulated through the accreditation processes, which are not only raised through the previous resolutions, but also from the SCFELP. For their part, normal schools must comply with a verification process of 14 quality conditions that authorize the operation of the corresponding complementary educational program. In both cases, normal and bachelor's degrees, the process is led by the Vice Ministry of Higher Education with the support of the National Intersectorial Commission for the Quality Assurance of Higher Education (CONACES) and the National Accreditation System of the National Council of Accreditation (CNA) (República de Colombia & Ministry of National Education, 2013).

Taking this into consideration, we argue that the established political procedures such as the establishment of the curriculum components, the profile of the educator, and the criteria of "quality of education," can confine the pre-service education of teachers to repetitive structures, lacking means to generate social and institutional transformations. This underlines the importance of having greater participation in political affairs, searching for new public policies for the improvement of educational practices over the improvement of the education market, and the generation of democratic scenarios within the political structures of education.

We found that there is relative autonomy at the university level, the educational system sacrifices educational quality for economic market-driven demands, Colombia's educational policies respond to global addresses, the assumptions of policymakers do not take into account the research results, there are no clear policies on SE, and there are no policies on EE in the pre-service education of teachers. On the other hand, there are constitutive contradictions between the NPEEC and practice (area of educative knowledge).

Sociopolitical context of bachelor's degrees

In a local context, such as within a university, some specific policies are also produced as a result of the interpretations, translations, and/or reproduction of the policies that are generated nationwide.

We began by identifying that the curriculum of the BBEENSEE program is defined through Resolution 047 of 2002 (Universidad del Valle, 2002a). Subsequently, through Resolution 0026 of 2002 (Universidad del Valle, 2002b), the BBEScEE program was created, which considers Law 30 of 1992 on the authorization of universities to confer university degrees in the different disciplinary fields, the curriculum reform of the university, and the results of the degree in primary education (first through fifth grade) creating a new program, and the approval of the curriculum by the academic council through Resolution 047 of 2002. The curricular structure was organized into basic, professional, complementary elective, professional elective, and compulsory law subjects until 2016. The basic and professional subjects were grouped into four components: environmental, scientific, pedagogical, and didactic.

When analyzing the objectives and the curricular structure, EE is identified as an objective of independent education of SE. However, when analyzing the curricular structure, EE is a discipline included in the Bachelor of Science program. The modifications of the degree begin with the modification of the name of the BBEENSEE program for the BNSEE through Resolution 071 of 2016 (Universidad del Valle, 2016a). They continue through Resolution 095 of September 2016 (Universidad del Valle, 2016b), which resolved to change the name of the BBEENSEE to BNSEE program, which applied to students entering the program from the date of approval by the MNE.

Subsequently, it was resolved to modify the curricular structure and update the academic program corresponding to the BNSEE program. Article 5 established the curricular structure of the program, which was in response to the resolutions proposed by the MNE and was organized into four components: general foundations, specific and disciplinary knowledge, pedagogy and educational sciences, and didactic component of the disciplines. These modifications did not affect the objective of having an educational program in EE. However, it can be analyzed how most of the subjects of the teaching component of the disciplines address SE. In this way, the hegemony of the dominant discourse of science on the curriculum is reproduced and perpetuates the inclusion relationship of EE-SC and not an association relationship.

Conclusions

This study has allowed us to identify the importance of the analysis of the socio-political context, and to recognize the conception of education in terms of the mechanization process, making it possible to expose the participation of the state, the government, and the public policymakers in a social network, not in terms of a linear relationship, but as a dynamic relationship in which the social actors participate in the different contexts that are part of the construction of the policy.

As part of this special issue, our article shows the interaction between educational policies and curriculum; likewise, we have been able to recognize how policies are based on ideological productions that will influence and condition, but not determine, certain social relationships and interactions.

This allows for discussion on the commodification of education through the search for “quality” and products, forgetting the process and the importance of education in society as well as the restricted “freedom” given as “university autonomy,” identifying through context reading that this autonomy is conditioned by state policies and the proposed nation project. This is seen in the incorporation of educational reform speeches proposed by the World Bank and other international entities in Colombian education policy, leading to the vulnerability of university autonomy from the political direction, with regard to the names of the programs, and to the characteristics, competences, and other elements to be considered by the programs accredited by the Ministry of National Education.

In conclusion, there are no clear policies regarding the content of the discipline, such as on the emphasis on natural sciences. There are only general approaches to the initial education of future teachers, although we do note that some policies attempt to define the content of that education in certain cases. We observe that while there is no specific policy on EE, there is a policy concerning its inclusion in educational institutions that is contradictory in the sense that it is a demand of the state but there is no education provided to teachers to prepare them.

Declaration of conflicting interest

The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Acknowledgment

This study was financed in part by the Coordenacão de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001, and by the Conselho Nacional de Desenvolvimento Científico y Tecnológico CNPq, process number 148873/2016-2.

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