

# Indicators for evaluation of public policies of Environmental Education in schools: an analysis in the light of the policy cycle and the theory of enactment<sup>1</sup>

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## *Indicadores para avaliação das políticas públicas de Educação Ambiental nas escolas: uma análise à luz do ciclo de políticas e da teoria da atuação*

Solange Reiguel Vieira\*  
Josmaria Lopes de Moraes\*\*  
Marília Andrade Torales Campos\*

### ABSTRACT

This article presents analysis of the process of applying an Indicator Matrix for evaluation of public policies on Environmental Education in schools. In order to do so, the study is based on the policy cycle (BALL; BOWE, 1992) and on the theory of policy enactment (BALL; MAGUIRE; BRAUN, 2016). It is argued that the conceptual approach of the policy cycle and the theory of enactment has given meaning to the evaluation instrument built by and for the actors of the context in which practice takes place. It has also helped in understanding the interrelations between the contextual dimensions of the theory of enactment and the dimensions that make up the Environmental Education Indicator Matrix built by several subjects of the policy. The interpretation and analysis of the data generated by applying the Indicator Matrix in school contexts with the participation of teachers indicate that the dimensions that structure the Matrix gain meaning when

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1 Translated by David Ian Harrad. Email: [davidharrad@hotmail.com](mailto:davidharrad@hotmail.com)

\* Universidade Federal do Paraná, Curitiba, Paraná, Brasil. E-mail: [solangerv@ufpr.br](mailto:solangerv@ufpr.br) - <https://orcid.org/0000-0001-6889-0511> E-mail: [mariliat.ufpr@gmail.com](mailto:mariliat.ufpr@gmail.com) - <https://orcid.org/0000-0002-4026-6239>

\*\* Universidade Tecnológica Federal do Paraná, Curitiba, Paraná, Brasil. Email: [jlormais@utfpr.edu.br](mailto:jlormais@utfpr.edu.br) - <https://orcid.org/0000-0002-2123-4725>

integrated with each other and related to appropriately situated contexts. Thus, the instrument demonstrates its relevance, especially for the evaluation stage in the policy cycle.

*Keywords:* Evaluation. Public policies. Environmental Education. Indicators.

## RESUMO

O artigo apresenta a análise do processo de aplicação de uma Matriz de Indicadores para a avaliação de políticas públicas de Educação Ambiental nas escolas. Para isso, o estudo se fundamenta no ciclo de políticas (BALL; BOWE, 1992) e na teoria da atuação (BALL; MAGUIRE; BRAUN, 2016). Argumenta-se que a abordagem conceitual do ciclo de políticas e a teoria da atuação deram significado ao instrumento de avaliação construído pelos e para os atores do contexto da prática. Assim também auxiliaram na compreensão das interrelações entre as dimensões contextuais da teoria da atuação e a Matriz de Indicadores de Educação Ambiental construída por diversos sujeitos da política. A interpretação e a análise dos dados gerados a partir da aplicação da Matriz de Indicadores em contextos escolares, com a participação das professoras, apontam que as dimensões que a estruturam tomam sentido quando integradas entre si e relacionadas a contextos apropriadamente situados. Assim, o instrumento demonstra sua relevância, em especial para a etapa de avaliação no ciclo de políticas.

*Palavras-chave:* Avaliação. Políticas públicas. Educação Ambiental. Indicadores.

## Introduction

Environmental Education is part of the agenda of social debates, and, consequently, has been on Brazilian political agendas since the twentieth century, integrated into broader scenarios, both nationally and internationally. Like any public policy, environmental education policies are subject to ideological and political interests, which unfold in the production of texts, such as legislation, programs, and institutional/governmental projects, to be put into practice in various contexts (SORRENTINO *et al.*, 2005; BIASOLI; SORRENTINO, 2018; VIEIRA; MORAIS; TORALES-CAMPOS, 2020).

First of all, in order to establish the theoretical perspectives on which this article is based, the concepts of environmental education present in the Treaty on Environmental Education for Sustainable Societies and Global Responsibility (BRASIL, 1992) and in the Política Nacional de Educação Ambiental –PNEA

[National Policy on Environmental Education] (BRASIL, 1999) have been adopted. In other words, environmental education is understood as a process of continuing learning based on individual and collective values for social transformation and political action, aimed at environmental conservation, quality of life, and socio-environmental sustainability.

The concept of public policy used in this study is that of “a set of decisions and actions of government (of national, subnational and supranational States) and other social actors” that contribute to the development of societies (HEIDEMANN, 2009, p. 28). We start from the understanding of multicenter public policy, which involves different centers of decision, the proposals of which when being built go beyond governmental boundaries and encompass public, private, supranational, non-governmental institutions and organized civil society to address public problems (SECCHI, 2014; BIASOLI; SORRENTINO, 2018).

Based on the understanding of the environmental education policy cycle, four perspectives of policy are applied: Policy, which comprises the content of the policy (programs, projects and norms); Polity, which refers to the political system, institutions, laws, powers (legislative, executive, judiciary) and formal bodies of environmental education; Politics, which refers to the social actors and forces at play; and, finally, the Everyday Politics regarding instituting social forces, pedagogy and planning with social participation in the political process (FREY, 2000; BIASOLI; SORRENTINO, 2018).

Understanding the nature of environmental education, we propose to promote a discussion here on public policies, specifically on the theme of evaluation. Above all, twenty-one years after the creation of the PNEA, which established environmental education as an essential component of Brazilian education, it is necessary to permanently monitor and critically evaluate this educational and social process. In keeping with the official legal and political texts resulting from the PNEA, which guide the compulsory nature of environmental education at all levels and modalities of public educational institutions, indicators are methodological resources that allow us to portray social reality, which can make a considerable contribution to the process of evaluating environmental education policies (JANNUZZI, 2017; RAYMUNDO *et al.*, 2019).

Based on the above, this study aims to present the process of developing and validating an Indicator Matrix with emphasis on the analysis of the results of the application of this tool for evaluation of Políticas Públicas de Educação Ambiental (PPEA) [Public Policies on Environmental Education] in school contexts. This study, which has a pluralist epistemological perspective, is based on the combination of theorists from the fields of research on Educational Policies and Environmental Education, bringing the policy cycle as a method to research, theorize, think and understand policies (MAINARDES; MARCONDES, 2009), as well as the theory of policy enactment (BALL; MAGUIRE; BRAUN, 2016).

## **Theoretical and methodological framework of this study**

The dialogue between the theoretical fields of Education Policies contained in PPEA forms an ambivalent scenario which, while demanding the insurgence of new epistemological perspectives, demands the “conscious and reflective use of concepts and ideas from different theories, which are articulated to compose a theoretical framework for research” (MAINARDES, 2018a, p. 13), also bearing in mind the need to incorporate diverse perspectives that abound in a context of great theoretical and practical complexity.

The policy cycle approach enables the “critical analysis of the trajectory of educational programs and policies from their initial formulation to their implementation in the context of practice and their effects” (MAINARDES, 2006, p. 48). In this sense, the phases of the political process, commonly used in studies on public policy, do not follow a linear pattern: agenda – formulation – implementation – evaluation. It is a consensus in the literature that for public policy founded on a continuous process, policy evaluation is something essential for analyzing its concreteness in various social contexts (FREY, 2000; MAINARDES, 2006; HEIDEMANN, 2009; LOTTA, 2010; SECCHI, 2014).

Thus, based on the understanding that these phases are fundamental throughout the policy process, Mainardes (2006) highlights that Stephen J. Ball, Bowe and colleagues, when developing the policy cycle approach from 1992 to 2012, broke away from the initial formulation, as the phases had a certain degree of rigidity. By considering that the policy process involves arenas, disputes, places and social actors, they proposed a more refined version of the policy cycle, in a continuous form (without a temporal, sequential, and/or linear dimension), comprised of five interrelated contexts: 1) the context of influence – social subjects and purposes; 2) the context of text production – formulation of the policy document; 3) the context of practice – enactment/implementation; 4) the context of results – effects; 5) the context of policy strategy – social and political activities. These contexts can be thought of in a variety of ways, they can be interconnected or “nested within each other.” It is also necessary to think about the speed of policies in the dimensions of time and space in which they occur (MAINARDES; MARCONDES, 2009, p. 306).

Based on the context of practice, Ball, Maguire, and Braun (2016) developed the theory of policy enactment through empirical exploration in English schools. This term in English is understood as the way in which policies, in a given context, are put into play or action. It is an expansion of the context of practice that contributes greatly to the analysis of Brazilian policies in various settings (MAINARDES, 2018b). The authors use the concept of policy

enactment instead of implementation. They conceive the context of practice as complex and dynamic, in which policies are not simply implemented, but subject to processes of interpretation, reinterpretation, and translation, carried out by the various actors who put the policy into action in the daily life of society, and, consequently, also in the daily life of the school. That is, “there is a social context and a materiality for the policy”, which also occurs in the school context (BALL; MAGUIRE; BRAUN, 2016, p. 201).

The concept of enactment therefore has as its premise the relationship between policy and practice. From this viewpoint, the subjects that experience daily educational life are much more than mere executors/implementers of policies, because they are agents of transformation and intervention in reality. They are potential actors for putting policies into action/practice, based on their experience, knowledge, interpretations, translations, and ideals of education through a hybrid process of contextualized, holistic, and realistic enactment. Also highlighted is the relevance of the context in which policies are put into action, from the contextual dimensions indicated: a) situated contexts; b) professional cultures; c) material contexts; d) external contexts (BALL; MAGUIRE; BRAUN, 2016).

In this sense, schools are considered spaces of production, enactment and materialization of policies, considering that they are permeated by a series of contextual conditions that cannot be separated from their immanence. Therefore, the relationship between schools and the communities they serve suggests important aspects to be considered in the evaluation of a policy. As such, the process of building the Indicator Matrix to which this study refers included the participation of various actors from the contexts of practice and was based on texts derived from the PNEA, namely, the Diretrizes Curriculares Nacionais para a Educação Ambiental [National Curriculum Guidelines for Environmental Education], the Programa Nacional de Escolas Sustentáveis [National Sustainable Schools Program], and the Política Estadual de Educação Ambiental do Paraná [Paraná State Policy for Environmental Education].

The development of the monitoring and evaluation indicators for PPEA took place as follows: The Indicator Matrix was built during research undertaken between 2014 and 2016. That research had two phases: the first phase involved the collective building of the Indicator Matrix (in a collaborating school), while the second phase involved the application and validation of the Matrix (eight schools). Representatives of school communities from the Paraná public school system in the city of Curitiba (teachers, employees, students, pedagogues and principals) participated in both phases.

Based on the results of that research, indicator validation processes were carried out between 2017 and 2020 by representatives of three school communities (coded as S1, S2 and S3) belonging to the Curitiba Municipal Education Network (students, teachers, administrators and pedagogues who articulate Full-time Education<sup>2</sup>) and teachers who undertake environmental education practices<sup>3</sup>, who contributed with their experiences in the practical context. It is noteworthy that environmental education practices are developed by teachers with postgraduate specialization in the area, by means of pedagogical workshops after school hours, focused on investigation, experimentation and student protagonism, in dialogue with the components of the curriculum (CURITIBA, 2020). The set of indicators was also shared with national and international specialists (Portugal, Spain, Mexico and Uruguay) with extensive experience and involvement in environmental education. The methodological approach for this stage consisted of using the Delphi technique, since it is of recognized importance for building qualitative indicators (MINAYO, 2009). After the specialists' feedback, the evaluations were systematized analytically both quantitatively (tabulating the frequency of answers responses for each indicator), and also qualitatively (analysis of the comments, suggestions, and criticisms received).

The research instrument was rebuilt and enhanced at each stage of the validation process by the various participants, who contributed with constructive observations and criticisms, based on their experiences and understanding of the field of environmental education. Based on the Delphi validation contributions, which enabled the expansion of the dimensions and indicators, as well as the establishment of descriptors and metrics, the Indicator Matrix was reformulated and is now comprised of four dimensions<sup>4</sup> (management, curriculum, physical space and community), eleven indicators and fifty descriptors in the form of questions.

After the validation process, the indicators were applied online with the three collaborating schools, via Google forms, in view of the closure of schools due to the COVID-19 pandemic and the impossibility of carrying out face-to-face activities.

2 Education professionals working in the area of Pedagogy, whose role is to articulate teaching work between school classes and accompany full-time education practices.

3 These practices are not a curricular discipline, but are an Environmental Education activity organized in the out-of-school period.

4 The previous version was comprised of three dimensions: management, curriculum and physical space.

The schools participating in the research fall under municipal administration and are located in the urban area of the same city as the local educational authorities. Practices are monitored by the Curitiba City Education Department, through intermediation by regional teaching coordinators and full-time education coordinators at the schools. Full-time education students have an annual workload of 1,800 hours, of which 800 hours are organized according to the curricular components of the Base Nacional Comum Curricular – BNCC [Common National Curricular Base], 800 hours are for the development of educational practices, including environmental education, and 200 hours for lunch time and free-time activities, distributed over 200 school days, each one lasting nine hours. Educational practices take place weekly in the out-of-school period and are aligned with the content planned for each year of schooling, aiming to enable specific themes to be dealt with in greater depth. School units operate as full-time education centers, whereby S3 is totally full-time and S1 and S2 are increasingly expanding enrollments in full-time education. The City Education Department has reported that currently 52% of its schools are offering full-time education in Curitiba and that it has surpassed target six of the National Education Plan.

The research included the participation of a representative from each school, specifically teachers of comprehensive environmental education practices, who gave us feedback about environmental education practices at school and their impressions of the evaluation instrument. It is also noteworthy that policy actors took part throughout the process, including the analysis, since the feedback to the subjects occurred at the end of each stage of the research.

Based on the results of this application of the Indicator Matrix, we sought to evaluate the impacts of the materialization of PPEA in the school context, specifically in the dimensions of management, curriculum, physical space and community, integrated with the contextual dimensions of the theory of policy enactment. A textual analysis of the National Policy on Environmental Education was also conducted considering the effectiveness of environmental education in schools. According to Mainardes (2007), analysis of how a policy is implemented involves the strategies used in the process; the extent to which school stakeholders were involved in the decision-making process, drafting the policy text and implementing it, as well as the extent to which the policy is committed to changing or maintaining the structures of power and control, in addition to consolidating the values of democracy, equality, social justice, inclusion, among others. Therefore, the analysis presented relates only to the evaluation indicator application phase.

## **Evaluation of school contexts based on the indicator dimensions and contextual dimensions of the theory of policy enactment**

The Indicator Matrix is an instrument for monitoring and evaluating Public Policies on Environmental Education in the context of practice. Based on qualitative analysis, it is possible to understand which actions or situations are stronger in schools, as well as weaknesses that need intervention work in order for them to be minimized. In this sense, the indicators represent interpreted social reality, which will inform school community decision making, in order to fit environmental education into each context.

In order to move forward with the process of interpreting the results obtained through applying the Indicator Matrix, we turned to the theory of enactment (BALL; MAGUIRE; BRAUN, 2016), since it expands the possibilities of indicator analysis, as a complementary effort, focusing on the context of policy cycle practice. We consider that schools are seen as the center of policy enactment, permeated by dynamics and institutional, contextual, historical, sociocultural factors and other social issues with which education professionals deal daily. Thus, interpretation of the contextual dimensions was done by reading the answers to the indicator descriptors administered with the teachers of the schools in the empirical field, and also by reading the Political-Pedagogical Projects of the school contexts (S1, S2 and S3), performing integrated analysis to understand the enforcement of environmental education policies and their interrelationships.

### **Management and situated contexts dimension**

The management dimension portrays the policy management process in schools, which involves the participation of the various actors of the school community in their different actions to build more democratic and sustainable schools. The indicators revealed that school communities have strong actions in the management of environmental education policies, described as follows.

*Indicator 1 – Democratic management:* this indicator evaluated the work of the schools and the principles of democratic management. The schools' strong points were: promotion of participatory moments (meetings, fairs, competitions, lectures or similar initiatives) for the school community; encouragement of



democratic management in the school by the principal; development of a culture of dialogue in the school; and socialization of the pedagogical proposal with the school community.

- *Indicator 2 – Planning, management and communication instruments:* this indicator evaluated the management and communication actions developed by the school. The crucial points of the schools were their annually updated Political-Pedagogical Projects, the use of participatory planning instruments (SDG) and communication/educommunication tools to disseminate the school's actions and interaction with the students' families and the community.
- *Indicator 3 – Collegiate bodies:* this indicator evaluated the work of collegiate bodies in environmental-educational actions. It highlighted student protagonism in environmental education actions at the three school units, both with regard to participation during classes and also in actions that involve community participation in the school.
- *Indicator 4 – Financial and human efficiency:* this indicator evaluated financial and human efficiency at the schools. The strong point shown by this indicator is the availability of teachers trained to undertake environmental education at school, especially those who work with integral practices in environmental education, in additional time and spaces, beyond the activities developed in regular classroom teaching.

Regarding the limitations of the management dimension, the following actions or situations appeared that enable reality to be brought closer to the school's field of possibilities: participation of the school community in environmental education trainings; participative updating of the schools' Political-Pedagogical Projects; seeking partnerships in order to provide sustainable educational spaces; effective work of the collegiate bodies; financial and human efficiency for developing environmental education.

This dimension is related to situated context factors<sup>5</sup>, which refer to aspects related to the school's history within its location and enrollment data. Geographic location can be seen as a generator of opportunities for the school, both in relation to priorities and educational needs (vacancies, programs available), and also standing out with regard to good practices and history built by schools and their communities (BALL; MAGUIRE; BRAUN, 2016).

<sup>5</sup> Situated contexts refer to aspects related to school location, school history and enrollment (BALL; MAGUIRE; BRAUN, 2016).

It is noteworthy that the specific context in which schools are situated also has historical, geographical and socioeconomic information as a backdrop, which is constantly developing and bringing challenges for schools and public policies. The school units have 28 years of history as Municipal Schools / Full-time Education Centers. They currently offer full-time elementary education (primary school and middle school), distributed over two periods of the day; in this way a student stays at school for up to nine hours a day. S1 has 18 full-time classes (575 students), S2 has 10 (290 enrolled students), while S3 differentiates itself by providing full-time education for all its classes (12 classes and 325 students). According to Mainardes (2007), the policy cycle has been implemented in the Brazilian public system to create a qualitative form of school organization that goes beyond the graded school model, in order to transform this excluding and selective educational system that resulted in high rates of failure, dropout and reproduction of inequalities.

According to Bourdieu (2004), it is fundamental to observe the relations existing between schools as institutions and students' social structure of origin, with realistic representations. It must be emphasized that socioeconomic conditions are also related to the availability of public schools and the demands placed on them. Furthermore, the important relationship of the school with the community and its relevance as an educating space for the reduction of violence and social vulnerability in school communities is highlighted. From the perspective of the politics of everyday life, participation is essential for public policies to make sense, without running the risk of turning into simulacra of social transformation (BIASOLI; SORRENTINO, 2018).

This contextual dimension points to the situational issue of the school and the history built by the subjects that experience in their daily lives potentialities and problems related to social issues, which are part of the real curriculum they live. In this sense, the Curitiba Municipal Education Network Elementary School Curriculum takes the city as a context that educates, based on the reality of the students in their local dimension. The city is formed by "people, spaces and histories that are marked by trajectories that are told and retold, by generations that constitute singular and plural identities, marked by social, political, cultural, economic and material relationships" that give meaning to daily actions and territorial belonging (CURITIBA, 2020, p. 9).

Moreover, histories, memories and times enter the political-pedagogical dispute so that curricula are expanded and allow the inclusion of cross-cutting themes (ARROYO, 2013). In this sense, school environmental education has the potential to develop an integrated understanding of the environment in its multiple and complex relationships, involving the community, such as:

conducting field classes or technical visits to work on socio-environmental issues; carrying out environmental education research projects with the community related to potentials/values to strengthen sense of identity and belonging. Finally, interrelations can be seen between the internal context (the school itself) and the external context (community, city hall, and state), as well as the management, curriculum, and community dimensions.

## **Curriculum and professional contexts dimension**

In the curriculum dimension, the focus of the policy is placed on the school curriculum, with the intention of measuring the ways in which knowledge related to environmental education is included in elementary education curricula, and the pedagogical actions that enable the development and potentialization of environmental education for the comprehensive education of students. The following are the strengths perceived based on the indicators of this dimension:

- *Indicator 5 – Curricular organization*: this indicator evaluated the forms of environmental education curricular organization. The three schools stood out with regard to the inclusion of environmental education in their Political-Pedagogical Projects and environmental education being included in the teachers' plans;
- *Indicator 6 – Pedagogical activities and practices*: this indicator evaluated environmental education pedagogical activities and practices. The results showed that the pedagogical practices developed in schools allow the inclusion of knowledge (traditional, from diverse cultures), diverse themes (gender, ethno-racial issues), and students with disabilities; and the use/production of technological and audiovisual resources that facilitate the understanding of local and global socio-environmental reality in pedagogical practices;
- *Indicator 7 – Projects and programs*: this indicator evaluated the environmental education actions developed through projects and programs. Common to all three schools was the development of governmental projects or programs (for the environment and environmental education), as well as their own projects focused on socio-environmental sustainability.

Schools S1 and S2 had nothing but strong points in this dimension. S3 showed limitations in relation to curriculum planning done together with teachers, projects proposed by the students themselves with local themes, and programs involving the community, which require theoretical approaches and collective practices. We understand that the curriculum is one of the most complex dimensions of the school system, precisely because it is the structuring core of the school, which is standardized, politicized, innovated, and re-signified (ARROYO, 2013).

We noticed that the practices reported by teachers in the research contexts have an interrelationship with the curriculum, physical space, management and community dimensions. They are therefore in accordance with the principles and objectives of the National Policy on Environmental Education, showing that the schools make an effort to comply with Law 9.795/1999 (BRASIL, 1999), to guarantee the right to environmental education within the school curricula of public elementary education, developed as a continuous practice integrated with programs that form part of the educational process, rather than being a specific subject on the curriculum, as provided for in Articles 3, 9 and 10 of that Law.

This dimension relates to the professional context of teachers and administrative and pedagogical staff, and is characterized by its focus on cultures, habits and values, as well as the involvement of all professionals in the school context. Each school has distinct professional cultures, particular perspectives and attitudes that evolve over time. In this sense, policy enforcement is seen as part of a process of interpretation permeated by institutional factors and dynamics involving individuals and groups of actors. These dynamics differ in the way each school community understands and shapes policies in the different environments in which it is embedded. Therefore, professional contexts are considered “multifaceted and confused” (BALL; MAGUIRE; BRAUN, 2016, p. 48).

In the core of the issues that make up the debate of this dimension, we add the concept of *habitus*, which represents internalization of historical and social factors experienced throughout the personal and professional history of social agents, in which their practices are built in concrete situations, through certain rules of the social structure and subjective interpretations. *Habitus* is formed in experiences and practices in the context in which the actors find themselves, which are directly linked to similar family and school formations, which favor the interests, affinities and worldviews, built based on their social experiences and realities (BOURDIEU, 2011) and it is from these premises that we can understand the data that emerge from the dialogue between the empirical and the theoretical.

The schools' professional staff is comprised of inspectors, administrative and technical personnel, cleaning/catering service staff, regular teachers, pedagogical staff, pedagogues who articulate full-time practices, principal and vice-principal. These diverse professionals have backgrounds, experiences, histories and experiences in the schools where they work and in other schools that they have passed through during their careers, and they carry with them their professional cultures and subjectivities, as well as their political stances. Certainly, each professional has a different reading of the policies; therefore, in the school collective, including teachers and the community, they form "webs of social relations and power that produce and circumscribe school policies and practices" (BALL; MAGUIRE; BRAUN, 2016, p. 67). These same authors assume that the actors in the context of practice are the subjects and objects of policies, that is, they interpret and build meanings of policies, and create conditions to put policies into practice, in the real conditions they face. Each actor therefore has their role in policy enforcement. Principals are generally responsible for interpreting policy texts, elaborating institutional meanings and narratives. Teachers are the enactors of policies in their classrooms. And, therefore, in a participatory way, the school community is part of a collective process of everyday policy enactment.

These meanings constitute themselves through interpretation and translation of policies. It can be said that interpretation occurs when policies are decoded and re-signified for the school, in an institutional political process, materialized in the Political-Pedagogical Project. Translation, on the other hand, occurs in moments of planning and pedagogical meetings or participatory evaluation so that the policy is put into practice according to the real priorities of the institution.

Based on the results of the evaluation of the answers to the management and curriculum dimension indicator descriptors, it can be said that the schools have teachers who have been trained in environmental education practices. However, this and other factors involve administrative issues related to external demands, such as allocation of financial resources, hiring and training of staff focused on environmental management and pedagogical support for environmental education actions.

As put forward by Bourdieu (2011), *habitus* is related to everyday practices. Thus, when analyzing the *habitus* that determines the actions of managers and teachers of the evaluated contexts, we realize the important role played by these actors in interpreting and devising meanings, as well as the collective effort for environmental education policies to be effective in school institutions.

A limitation of the S3 social agents was identified with regard to promoting joint curricular planning that would allow the involvement of students and the surrounding community (community leaders). This form of policy making in the context of practice requires subjective motivations that favor participation, as demanded by the current moment in time, because there is a “central and daily challenge of environmental education for the whole community” (BIASOLI; SORRENTINO, 2018, p. 13).

For a better understanding of the professional practices of those who experience public policies in their daily lives, it would be necessary to monitor and observe *in loco* for a longer period of time in the schools, in search of more in-depth answers for the policies experienced in the spaces investigated. Furthermore, it can be seen that this contextual dimension correlates in an integrated way with the management, curriculum, and physical space dimensions.

## **Physical space and material contexts dimension**

Material contexts include the physical aspects of the school, such as infrastructure, buildings, teaching and learning environments, their relations with quality and extent (or not), which can have a considerable impact when putting policies into action in different contextual realities (BALL; MAGUIRE; BRAUN, 2016). In the physical space dimension, the contextualization of environmental education policies was evaluated through indicators that measure the use of the territory and the surroundings for the development of environmental education, infrastructure, educational environments and environmental management actions.

- *Indicator 8 – School territory and surroundings*: this indicator evaluated use of school territory and surrounding areas for developing environmental education. Common points in the school units for this indicator are: the use of physical space (vegetable garden, other green areas, playground, local ecosystems, squares, gardens, and public parks) in the school territory as learning environments for environmental education; and actions of the school community to promote the care and preservation of its environment and surroundings.

- *Indicator 9 – Infrastructure and educational environment*: this indicator evaluated the use of infrastructure and educational environment for citizen education. In all three schools, the use of the sports court for doing cooperative activities (sports, games and playing) and the use of the library for reading, studying and researching environmental education stand out.
- *Indicator 10 – Eco-efficiency*: this indicator evaluated environmental management actions in the school space. Standing out for this indicator were measures proposed for critical analysis of consumerism and to promote reduction, separation and proper disposal of its waste (recyclable and organic); encouragement of healthy eating with observation and experiments; adoption of measures to reduce the use of water at school and the preservation of water resources; and use of measures to avoid wasting office supplies (paper, ink, etc.).

The main limitations of this dimension refer to the school environment, promoting accessibility, encouragement of alternative (sustainable) forms of transport and adoption of energy consumption and/or production practices, to be developed by the school community.

From this perspective, the physical space dimension presents itself as an environment of contextualization of environmental education policies. Thus, in the school building, besides the classrooms, we detected learning spaces and environments for enhancing environmental education, such as: a library, a computer/innovation lab with broadband Internet access accessible to students and pedagogical guidance for research and production on environmental issues. Covered sports court to promote the culture of cooperation and collective spirit, as well as covered/open-air patios and playgrounds; vegetable gardens, gardens and green areas that enable learning and healthy eating habits; the challenges of accessibility (school premises, adequate roads and bathrooms) in order to be an integrating environment, encouraging the use of bicycles and other sustainable means of transportation, office supply efficiency, adoption of strategies to reduce water and energy consumption, as well as critical reflection on preservation of water resources.

Other possibilities include: the use of other environments surrounding the school that allow students to have a better understanding of the space where the school is located; activities to analyze socio-environmental conflicts existing in its territory of influence; practices that allow identification of local transformations caused by climate change such as monitoring water quality, early warnings of drought or floods, debates and proposals for intervention with the community or public policies; community action to prevent emergencies or local socio-environmental risks. As presented in the situated contexts, the city is taken

as an educating context at the local level. In this approach, school interaction with community participation forms a central element of environmental education to strengthen the bonds of identity and belonging to the territory, so that cultural and socio-environmental transformations can take place.

S1 has a Farol do Saber<sup>6</sup> [Knowledge Lighthouse] within its grounds, which opened in 1995. This place serves as a library for students and the community, providing books for reading and research, and computers with internet access. Cultural events are also held, such as storytelling or other activities that develop in students the pleasure of reading. We can see that the physical space and material contexts dimensions correlate with the community and with the structural conditions for the accomplishment of pedagogical curricular practices.

## Community and external contexts dimension

The community dimension measures the school-community relationship and evaluates practices that allow community participation.

- *Indicator II – School and community relationship*: this indicator evaluated the practices that allow school and community integration. The common point for this indicator between the three schools was the creation of conditions for strengthening ties with the community.

Some factors to be considered by schools in this dimension are: participation of local groups, associations, and watershed committees in the school territory; promotion of sustainability actions with community participation; identification of local socio-environmental emergencies or risks; and establishment of local partnerships for the development of community projects. It seemed challenging for schools to go beyond their walls and explore the territories. However, this challenge faced by schools as educational policies expand also broadens their alternatives and concrete opportunities for full interaction between schools and communities, based on certain social dynamics that allow projects in common to be carried out that enable the development of the community in which the schools are located (GÓMES; FREITAS; CALEJAS, 2007).

<sup>6</sup> The Knowledge Lighthouses are a network of small libraries located in or next to public facilities in the city of Curitiba, state of Paraná. They are open from Monday to Friday, from 8 a.m. to 9 p.m.



External contexts refer to aspects linked to “the pressures and expectations generated by broader local and national policy frameworks” (BALL, MAGUIRE; BRAUN, 2016, p. 57). This interpretation includes consideration of the publicizing of school performance results and goals as measured by the national evaluation system, according to the level of education quality at the local level, as well as diverse external supports. As this theme is not included in the indicator descriptors, it was not possible to assess with the teachers whether the Elementary Education Development Index or other external evaluations interfere in school practices, which are related to the curriculum dimension. However, in the analysis of the Political-Pedagogical Projects, it was possible to identify some influences in the context of practice. Schools S1 and S2 address the external evaluations carried out by the federal and municipal governments such as: *Provinha Brasil* (2<sup>nd</sup> grade), *Avaliação Nacional de Alfabetização – ANA* [National Literacy Evaluation] (3<sup>rd</sup> grade), *Sistema de Avaliação de Rendimento Escolar – SIMARE/Curitiba* [School Performance Evaluation System/Curitiba] (4<sup>th</sup> grade) and *Prova Brasil* (5<sup>th</sup> grade). The three schools mention in their Political-Pedagogical Projects institutional evaluation proposed according to the Quality Parameters and Indicators, as an instrument of collective evaluation that gives the school community the opportunity to reflect on different issues of how the school is organized, and the planning of educational actions to improve the quality of education.

It can be seen that the school units understand external evaluations as a means of assessing the performance of systems regarding the quality of education provided for planning, analysis of the work and autonomy of the school itself in the management of public policies. In this way, schools can adjust their practices to improve the quality of the teaching-learning process of their students according to their real needs.

We also consider as external contexts the aspects analyzed in the management dimension, such as seeking funding from non-governmental organizations or the United Nations for the development of environmental education proposals, already underway at S1 and S2, but which presents itself as a challenge to be considered by S3.

Throughout the analysis, we observed in the schools participating in the research their situated contexts, material contexts, professional contexts and, finally, the external contextual dimension, which form a web of interrelationships in the context of public policies. In closing this exercise of interpreting the theory of enactment of environmental education policies, we realize the complexity of this process. Moreover, the analyses carried out based on the places where the policies are addressed make it possible to know their histories, cultures, and the dynamics and experiences in schools. On the other hand, they enunciate the need

to understand how school communities deal with the various policies defined by different government proposals. Therefore, this would require immersion in the daily life we researched in order to gain an understanding of the reality observed, a reflexive and contextualized analysis for social transformation and overcoming inequalities.

## **Final considerations**

When developing this research, the conceptual approach of the policy cycle was essential for producing the Environmental Education Indicator Matrix, through the process of preparing, enhancing, validating and applying. Based on the analysis of this last stage, aimed at applying the evaluation indicators with the participation of elementary school teachers, it can be stated that the instrument developed is valid for monitoring and evaluation of Public Policies on Environmental Education that are being enacted in the school context.

The theory of enactment gave meaning to the instrument built by and for the actors in the context of practice, the contextual dimensions of which are complementary elements in the exploration of the four dimensions of the Environmental Education Indicator Matrix in the contexts evaluated. These aspects were incorporated, in clusters, in the analysis in order to understand the forms of enforcement of Public Policies on Environmental Education in schools and their inter-relationships. Finally, it is our understanding that the instrument developed can contribute to overcoming the challenge of evaluating public policies in Elementary Education, so that it can be used as a parameter to assess the progress and impact of educational-environmental actions in Brazilian schools, as well as the effective implementation of Public Policies on Environmental Education in the school environment.

## REFERENCES

- ARROYO, Miguel González. *Currículo, território em disputa*. 5. ed. Petrópolis, RJ: Vozes, 2013.
- BALL, Stephen John; BOWE, Richard. Subject departments and the “implementation” of National Curriculum policy: an overview of the issues. *Journal of Curriculum Studies*, London, n. 24, v. 2, p. 97-115, 1992.
- BALL, Stephen J. Entrevista com Stephen John Ball: um diálogo sobre justiça social, pesquisa e política educacional. [Entrevista cedida a] Jefferson Mainardes e Maria Inês Marcondes. *Educação & Sociedade*, Campinas, v. 30, n. 106, p. 303-318, jan./abr. 2009. Available at: <https://www.scielo.br/j/es/a/KCJrrfcWgxsnhp8ZVN4R4Jt/?format=pdf&lang=pt>. Access on: Nov. 20, 2020.
- BALL, Stephen John; MAGUIRE, Meg; BRAUN, Annette. *Como as escolas fazem as políticas*: atuação em escolas secundárias. Tradução de Janete Bridon. Ponta Grossa: Editora UEPG, 2016.
- BIASOLI, Semíramis; SORRENTINO, Marcos. Dimensões das Políticas Públicas de educação Ambiental: a necessária inclusão da política do cotidiano. *Ambiente & Sociedade*. São Paulo, v. 21, p. 1-18, 2018. Available at: <https://www.scielo.br/j/asoc/a/PHWpKWMk9HJtBQdGWbsLxNs/?lang=pt>. Access on: Feb 5, 2020.
- BOURDIEU, Pierre. *Os usos sociais das ciências*: por uma sociologia clínica do campo científico. São Paulo: UNESP, 2004.
- BOURDIEU, Pierre. *Razões práticas*: Sobre a teoria da ação. Tradução de Mariza Corrêa. 11. ed. Campinas: Papirus, 2011.
- BRASIL. *Tratado de Educação Ambiental para Sociedades Sustentáveis e Responsabilidade Global*. Rio de Janeiro: Rio 92, 1992.
- BRASIL. Presidência da República. *Lei nº 9.795, de 27 de abril de 1999*. Dispõe sobre a educação ambiental, institui a Política Nacional de Educação Ambiental e dá outras providências. Brasília, DF: Presidência da República, 27 abr. 1999. Available at: [planalto.gov.br/ccivil\\_03/leis/19795.htm](http://planalto.gov.br/ccivil_03/leis/19795.htm). Access on: Feb. 5, 2020.
- CURITIBA. Secretaria Municipal da Educação de Curitiba. *Currículo do ensino Fundamental 1º ao 9º ano*. Curitiba: Superintendência de Gestão Educacional, Departamento de Ensino Fundamental, 2020. v. 1. Available at: [http://multimidia.cidadeedoconhecimento.org.br/CidadeDoConhecimento/lateral\\_esquerda/menu/downloads/arquivos/10348/download10348.pdf](http://multimidia.cidadeedoconhecimento.org.br/CidadeDoConhecimento/lateral_esquerda/menu/downloads/arquivos/10348/download10348.pdf). Access on: Aug. 5, 2020.
- FREY, Klaus. Políticas públicas: um debate conceitual e reflexões referentes à prática da análise de políticas públicas no Brasil. *Planejamento e Políticas Públicas*, Brasília, n. 21. p. 211-260, jun. 2000. Available at: <http://www.ipea.gov.br/ppp/index.php/PPP/article/viewFile/89/158>. Access on: Feb. 5, 2020.

GÓMEZ, José Antonio Caride; FREITAS, Orlando Manuel Pereira; CALLEJAS, Germán Vargas. *Educação e Desenvolvimento Comunitário Local: perspectivas pedagógicas e sociais da sustentabilidade*. Porto: Profedições, 2007.

HEIDEMANN, Francisco G. Do sonho do progresso às políticas de desenvolvimento. In: HEIDEMANN, Francisco G.; SALM, José Francisco (org.). *Políticas públicas e desenvolvimento: bases epistemológicas e modelos de análise*. Brasília: UNB, 2009. p. 22-39.

JANNUZZI, Paulo de Martino. *Monitoramento e Avaliação de Programas Sociais: uma introdução aos conceitos e técnicas*. Campinas: Alínea, 2017.

LOTTA, Gabriela Spanghero. *Implementação de políticas públicas: o impacto dos fatores relacionais e organizacionais sobre a atuação dos burocratas de nível de rua no Programa Saúde da Família*. 2010. 295f. Tese (Doutorado em Ciência Política) – Universidade de São Paulo, São Paulo, 2010.

MAINARDES, Jefferson. Abordagem do ciclo de políticas: uma contribuição para a análise de políticas educacionais. *Educação e Sociedade*, Campinas, v. 27, n. 94, p. 47-69, 2006. Available at: <https://www.scielo.br/pdf/es/v27n94/a03v27n94.pdf>. Access on: Mar 22, 2020.

MAINARDES, Jefferson. *Reinterpretando os ciclos de aprendizagem*. São Paulo: Cortez, 2007.

MAINARDES, Jefferson. A pesquisa no campo da política educacional: perspectivas teórico-epistemológicas e o lugar do pluralismo. *Revista Brasileira de Educação*, Rio de Janeiro, v. 23, p. 1-20, 2018a. Available at: [https://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S1413-24782018000100227](https://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-24782018000100227). Access on: Aug. 5, 2020.

MAINARDES, Jefferson. A abordagem do ciclo de políticas: explorando alguns desafios da sua utilização no campo da Política Educacional. *Jornal de Políticas Educacionais*, Curitiba, v. 12, n. 16, 2018b. Availalbe at: <https://revistas.ufpr.br/jpe/article/view/59217/36164>. Access on: Aug. 15, 2020.

MINAYO, Maria Cecília de Souza. Construção de Indicadores Qualitativos para Avaliação de Mudanças. *Revista Brasileira de Educação Médica*, Brasília v. 1, n. 33, Supl. 1, p. 83-91, 2009. Available at: <https://www.scielo.br/pdf/rbem/v33s1/a09v33s1.pdf>. Access on: Aug. 6, 2020.

RAYMUNDO, Maria Henriqueta Andrade *et al.* (org.). *Avaliação e monitoramento de políticas públicas de educação ambiental no Brasil: transição para sociedades sustentáveis* [recurso eletrônico]. Piracicaba: MH-Ambiente Natural, 2019. Available at: <https://www.funbea.org.br/wp-content/uploads/2020/01/livro-MonitoraEA-2.pdf>. Access on: Apr. 4, 2020.

SORRENTINO, Marcos *et al.* A Educação Ambiental como política pública. *Educação e Pesquisa*, São Paulo, v. 31, n. 2, p. 285-299, maio/ago. 2005. Available at: <https://www.scielo.br/pdf/ep/v31n2/a10v31n2.pdf>. Access on: Mar. 23, 2019.

SECCHI, Leonardo. *Políticas Públicas: Conceitos, Esquemas de análise; Casos Práticos*. São Paulo: Cengage Learning, 2014.

VIEIRA, Solange Reiguel; MORAIS, Josmaria Lopes de; TORALES-CAMPOS, Marília Andrade. A Educação Ambiental na agenda das políticas públicas brasileiras: uma análise a partir do conceito de ciclo de políticas. *Pedagogia Social, Tercera Época*. Salamanca, n. 36, p. 35-48, jul./dic. 2020. Available at: [https://doi.org/10.7179/PSRI\\_2020.36.02](https://doi.org/10.7179/PSRI_2020.36.02). Access on: Aug. 1, 2020.

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