



# Education principles and practises turned to sustainability in primary school

Arthur William Pereira da Silva<sup>1</sup> · Ana Lúcia de Araújo Lima Coelho<sup>2</sup> ·  
Helaine Cristine Carneiro dos Santos<sup>3</sup> · Alípio Ramos Veiga Neto<sup>4</sup> ·  
Ahiram Brunni Cartaxo de Castro<sup>4</sup> · Walid Abbas El-Aouar<sup>4</sup>

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## Abstract

With the objective to contribute to improving the education practises turned to sustainability, as well as to the training of sustainable individuals, this research has two main goals. The first one concerns the identification of the main EfS guiding principles turned to primary education, which aims at bringing some relevant theoretical contribution to the area through the proposition of an integrating framework. The second goal concerns identifying and analysing how education for sustainability is developed in a primary school, in the light of the framework suggested in the research, and how the EfS practises developed in this school can be improved. The present qualitative research follows the interpretative paradigm assumptions and has a phenomenological approach. Its main research method is the case study. The school which is the subject of study in this research is located in north-eastern Brazil. The research encompasses 2nd, 3rd and 5th graders, as well and Teachers and Principals. At first, the results enabled the proposition of a framework composed of 14 guiding principles from Education for Sustainability turned to primary schools, which, despite being an initial proposition, is believed to be strong enough in order to significantly contribute to the introduction of assertive practises in this area. Then, it becomes evident that, in relation to how Education for Sustainability is developed at the school under discussion, and how it can be improved, the institution is already working fully in accordance with 08 out of the 14 principles of the framework suggested in this study. Four other principles are partly met and 02 others have not been met yet.

**Keywords** Education for sustainability · Primary school · Phenomenology · Environmental education

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✉ Arthur William Pereira da Silva  
Arthur.silva@ifce.edu.br

Extended author information available on the last page of the article

## 1 Introduction

In the late 1900s, leaders from several countries started to defend the need of a new kind of development based on the pillars of sustainability in the search for a balance between the economic, social and environmental dimensions, with the objective to guarantee the satisfaction of needs and desires of present and future generations (Brundtland 1987; Elkington 1997; Sachs 2002; Montiel and Delgado-Ceballos 2014; Silva et al. 2014; Jenkins 2015). However, it is worth mentioning that this new way of thinking about human improvement is still developing and taking its first steps towards its establishment, and, in order to go further, it needs to fiercely fight for space against the unidimensional bias that is still hegemonic in most societies.

It is in this sense that the fourth dimension of sustainability, the educational dimension, suggested by Lopes and Tenório (2006), becomes relevant. According to them, the establishment of sustainability and sustainable development is only possible via educational actions through which people must access the principles of sustainability so that, by doing so, they can transform their decision-taking models, their habits and traditions, and become co-creators of a sustainable society.

Jickling (2009), Sartori et al. (2014) and Griswold (2017) emphasise the relevance of education for sustainability upon stressing that one of the greatest challenges of sustainability, besides integrating economy, environment and society, and considering the consequences of the present and future actions, lies on the society's awareness and involvement with this cause, which must be done through educational actions, as defended by Lopes and Tenório (2006).

If education for sustainability is seen by several authors (Springett 2005; Gadotti 2008; Samuelsson and Kaga 2008; Jickling 2009; Sartori et al. 2014; Griswold 2017; Dubey et al. 2017) as a key strategy to reach sustainable development, it is important to understand that it is developed under several levels of teaching, that is from primary school to post-graduation programs. This aspect also requires that education for sustainability adjusts itself to the peculiarities and particularities of each one of these levels, with the objective to become meaningful to the students in each educational step.

Another item to be highlighted concerning education for sustainability is that its implementation is extremely relevant in every existing educational level, for on each level it will reach individuals of different age groups, which, through learning that comes from this type of education, will be able to contribute with different ways to a more sustainable society, as well as to different moments in time. However, despite today's adult decisions directly impacting the sustainability of a future world, it is today's children's future decisions that will be able to safeguard the planet on the long run.

Thus, despite considering the relevance of education for sustainability on the most advanced teaching levels, as in graduation or post-graduation, this research focuses on the initial teaching levels, more specifically the primary school levels, when children are instructed, since they are the link to the future and the individuals who will cross the indifferent time border and who will take the future decisions that will define the course of human societies.

Engdahl (2015) states that children's education emerged in the last decade as an important factor and also as a booster to reach the sustainable development. Although it was possible to notice the existence of a certain corpus of guiding principles of practises of education for sustainability, specifically turned to this level of teaching in international literature, a revision identified that they are still excessively dispersed and demand the design and the

proposition of a framework which gathers the main guiding practise principles of Education for Sustainability turned to a primary school.

This way, and considering the relevance of education to enable the development of a sustainable society, the specific EfS importance towards primary school with this purpose, and the need to gather the various guiding principles of this educational model, which are scattered nowadays, through a framework that is able to encompass a large share of the problems on the theme, this research has two main goals: the first one concerns the identification of the main EfS guiding principles towards primary school, which aim at bringing some relevant theoretical contribution to the area through the proposition of an integrating framework. The second goal concerns identifying and analysing how education for sustainability is developed in a Brazilian primary school, in the light of the framework suggested in the research, and how the EfS practises developed in this school can be improved.

## 2 Theoretical framework

This section tries to present a summary of the main principles of education for sustainability specifically turned to a primary school. For such, several national and international authors who are specialists on this theme were invited to make this guideline list. The summary of this set of principles aims at orientating the implementation of education for sustainability in a primary school, as well as enabling their confrontation with the practises developed at the school that is the subject of this study. After a systematic literature review, 14 principles were considered, and suggested by different authors, as being of fundamental importance for the implementation and development of EfS in primary school. These principles are presented and discussed as follows.

The first EfS guiding principle identified in primary school is called “principle of adults-children methodological differentiation”, which was suggested based on reflections by Kjørholt (2012). According to the authors, and despite the fundamental guiding principles of education for sustainability being the same for adults and children, to which Coelho et al. (2018) suggest a summary, there are pedagogical and methodological practises which are specifically used in education for sustainability turned to primary school, and hence the importance of developing differentiated practises for the development of EfS in primary school.

Premises by Davis and Elliott (2014) suggest a second principle of EfS for primary school, which, in this study, was called the “principle of children as changing agents”. According to Davis and Elliott (2014), little children must be recognised as participants and owners of rights from a wider societal perspective; they must be seen as citizens or even as changing agents. The authors defend that only then will EfS be really effective in primary school.

From writings by Engdahl (2015), a third fundamental principle was identified for the establishment of EfS in primary school. This principle was called “children should not be underestimated”. To the author, adults tend to underestimate children’s knowledge about sustainability by believing they are not mature enough to understand the environmental, social and economic problems. Such prejudice must be avoided with the objective to reach the EfS goals in primary school.

Another principle that is important to EfS on this teaching level was identified through propositions by Jensen (2002), Davis (2008), Engdahl (2015) and Jenkins (2015), and was called “children as leaders of EfS practises”. According to the authors,

a large number of education professionals do not support children's initiatives turned to EfS and do not hear them simply by underestimating their knowledge. However, it is very important to hear and implement their ideas, in a way they are not supporting actors any longer and become the leading actors of these initiatives, which will motivate them by using a constructivist approach as basis and leaving the old model of knowledge transmission behind. However, it should be mentioned that, according to these authors, it is appropriate that sharing the role of this founder and promoter of EfS practises between teachers and students should happen gradually, in a way the teachers must really start the idealisation and promotion of EfS activities but, as children take part in and get involved with the processes, teachers must allow and encourage them into an active role upon idealising and promoting new sustainable practises.

Engdahl (2015) and Busatto (2015) call attention to another item that was also suggested as being one of the main EfS basic principles in primary school, and the authors' recommendation gave birth to a principle that, in this work, is called "the environmentalist bias should be avoided". To the authors, there is a trend between teachers and children to address environmental issues related to the sustainable development, and to leave issues related to social and economic aspects behind. This practise must be avoided within the EfS corpus, and an interdisciplinary view must be searched for, one that considers other sustainability dimensions.

Studies by Green and Somerville (2015) served as a basis for the proposition of one more principle, which was called "principle of materiality of school grounds". According to the authors, the EfS practises are moulded by the possibilities offered by the school's physical space and the resources available there. The richer the possibilities of a school's physical space, and the better the use the teachers will make of the available resources, the richer and more productive will the developed EfS practises be.

The seventh principle came from researches carried out by Green and Somerville (2015), Norddahl (2008) and Engdahl (2015) and was called "connections with local places". To these authors, EfS practises are moulded by location, region and landscapes or by specific places where the teaching–learning process happens. This way, exploring becomes extremely relevant, besides the possibilities that come from the school's physical grounds, those offered by the contributory and accessible extra-school environments, according to each region's features, such as rivers, creeks, groves, gardens and damp areas, among several others which may offer different learning experiences to students.

Another principle that comes from studies by Green and Somerville (2015) was the one illustrated by this research in partnerships with the community. In their writings, the authors defend that teachers must try to make partnerships with other social actors that are members of the local community and who may somehow add to the EfS practises developed, with the objective to widen and aggregate a higher transforming potential to these practises.

From the results of their studies, Norddahl (2008) and Engdahl (2015) also suggest that the EfS practises must offer moments during which children may experiment living with different people, populations and cultures, so as to learn how to respect these differences. This guiding element was named the "principle of promotion of real communal experience for children". Another principle that came from writings by Norddahl (2008) and Engdahl (2015) here is named "promotion of real environmental experience for children". The authors also defend that, in order for children to respect nature, it is necessary they know it first. This way, the EfS practises must bring moments of real touch between children and nature, during which they can marvel at its beauties, fascinations and natural phenomena.

The eleventh EfS principle in primary school suggested by this study is the “promotion of understanding how nature works and where our resources come from”. This principle was established from results of studies by Norddahl (2008), Engdahl (2015) and Green and Somerville (2015). These researchers sustain that, besides knowing nature so that children may respect and defend it, they need to understand how it works and that it is the universal provider of the resources that are necessary to meet our needs and desires. To this end, some practises can be developed, such as vegetable cultivation, animal nursing, gardening and composting experiments, among many other possibilities.

In their notes, Norddahl (2008), Green and Somerville (2015), Davis (2015), Jenkins (2015) and Jensen (2002) argue that EfS turned to primary school must be backed up by processes which challenge the traditional trainings, and give up the innovative use of the resources available, with the objective to enable children to analyse interdisciplinary problematic issues that involve social, environmental and economic aspects, to create resolution alternatives to these issues by themselves, and to be able to critically make decisions about more sustainable alternatives to the solution of the problems presented. This important guidance, summarised from studies by the authors mentioned, was named “creative processes and children’s critical view development”.

The research’s results and the reflections by Jenkins (2015) also supported the proposition of the principle here named “transversality and rich concepts”. The author argues that, as in the general EfS transversality principle (Coelho et al. 2018), this more specific principle states that EfS must not be dealt with as an isolated subject. Instead, it must be inter-connected to several other programs which are not discussed in an institution. However, as a facilitator element of this integration, the use of the so-called rich concepts is suggested. They are but vast, transversal and multi-faceted themes, rich in possibilities when it concerns the critical interdisciplinary analysis, enabling its debate from the perspective of several subjects. Some examples of these concepts are citizenship, ecological sustainability, human rights, justice, conflict and cooperation and social justice, among many other different possibilities.

Lastly, the fourteenth EfS principle in the primary school suggested in this research is “teachers’ preparation”, established through studies by Evans et al. (2012) and Kennelly et al. (2012). To these authors, and before trying to instigate any critical and sustainable thinking into children, it is necessary to invest in teachers’ training since they are the main characters within the school environment who will interact with children in the search for EfS objectives, and, oftentimes, they are not sufficiently prepared for that when, for example, they do not have a sufficiently deep and wide conception of sustainability and sustainable development.

Upon presenting a response to the two main goals of this research, which are to identify the main EfS guiding principles to primary school and suggest an integrating framework, Table 1 shows the summary of this set of principles with the objective to guide the implementation of education for sustainability in this teaching level more clearly, as well as to enable the confrontation of these principles with the practises developed in the school that is the object of this study.

The methodological aspects of this study will be presented next, with the objective to enable the comprehension of the steps that were taken up to the achievement of the objective established.

**Table 1** A summary of principles of education for sustainability targeted at primary school. *Source:* Elaborated by the authors, 2017

Authors/year	Principles	Description
Kjørholt (2012)	Adults-children methodological differentiation	Although the fundamental guiding principles of education for sustainability are the same for both adults and children, there are pedagogical and methodological practises which are specifically used in education for sustainability in primary school
Davis and Elliott (2014)	Children as changing agents	Little children must be recognised as participants and owners of rights from a wider societal perspective, and they must be seen as citizens or even as changing agents
Engdahl (2015)	Children should not be underestimated	Adults tend to underestimate children's knowledge about sustainability by believing they are not mature enough to understand the environmental, social and economic problems. Such prejudice must be avoided with the objective to reach the EFS goals
Davis (2008), Engdahl (2015), Jenkins (2015) and Jensen (2002)	Children as leaders of EFS practises	A large number of education professionals do not support children's initiatives turned to EFS and do not hear them simply by underestimating their knowledge. However, it is very important to hear and implement their ideas, in a way they are not supporting actors any longer and become the leading actors of these initiatives, which will motivate them by using a constructivist approach as basis and leaving the old model of knowledge transmission behind. However, it should be mentioned that it is appropriate that sharing the role of this founder and promoter of EFS practises between teachers and students should happen gradually, in a way the teachers must really start the idealisation and promotion of EFS activities but, as children take part in and get involved with the processes, the teachers must allow and encourage them into an active role upon idealising and promoting new sustainable practises

**Table 1** (continued)

Authors/year	Principles	Description
Engdahl (2015) and Busatto (2015)	The environmentalist bias should be avoided	There is a trend between teachers and children to address environmental issues related to the sustainable development, and to leave issues related to social and economic aspects behind. This practise must be avoided within the EFS corpus
Green and Somerville (2015)	Materiality of school grounds	EFS practises are moulded by the possibilities offered by the school's physical space and the resources available there. The richer the possibilities of a school's physical space, and the better the use the teachers will make of the available resources, the richer and more productive will the developed EFS practises be
Green and Somerville (2015), Norddahl (2008) and Engdahl (2015)	Connections with local places	EFS practises are moulded by location, region and landscapes or by specific places where the teaching-learning process happens. This way, exploring becomes extremely relevant, besides the possibilities that come from the school's physical grounds, those offered by the contributory and accessible extra-school environments, according to each region's features, such as rivers, creeks, groves, gardens and damp areas, among several others which may offer different learning experiences to students
Green and Somerville (2015)	Partnerships with the community	Teachers must try to make partnerships with other social actors that are members of the local community and who may somehow add to the EFS practises developed, with the objective to widen and aggregate a higher transforming potential to these practises
Norddahl (2008) and Engdahl (2015)	Promotion of real communal experience for children	EFS practises must offer moments during which children may experiment living with different people, populations and cultures, so as to learn how to respect these differences

**Table 1** (continued)

Authors/year	Principles	Description
Norrdahl (2008) and Engdahl (2015)	Promotion of real environmental experience for children	In order for children to respect nature, it is necessary they know it first. This way, the EIS practises must bring moments of real touch between children and nature, during which they can marvel at its beauties, fascinations and natural phenomena
Norrdahl (2008), Engdahl (2015) Green and Somerville (2015)	Promotion of understanding how nature works and where our resources come from	Besides knowing nature so that children may respect and defend it, they need to understand how it works and that it is the universal provider of the resources that are necessary to meet our needs and desires. To this end, some practises can be developed, such as vegetable cultivation, animal nursing, gardening and composting experiments, among many other possibilities
Norrdahl (2008), Green and Somerville (2015), Davis (2015), Jenkins (2015) and Jensen (2002)	Creative processes and children's critical view development	Processes which challenge the traditional trainings and give up the innovative use of the available resources, with the objective to enable children to analyse interdisciplinary problematic issues that involve social, environmental and economic aspects, to create resolution alternatives to these issues by themselves, and to be able to critically make decisions about more sustainable alternatives to the solution of the problems presented



**Table 1** (continued)

Authors/year	Principles	Description
Jenkins (2015)	Transversality and rich concepts	<p>As in the general EFS transversality principle, this more specific principle states that EFS must not be dealt with as an isolated school subject. Instead, it must be inter-connected to several other programs which are not discussed in an institution. However, as a facilitator element of this integration, the use of the so-called rich concepts is suggested. They are but vast, transversal and multi-faceted themes, rich in possibilities when it concerns the critical interdisciplinary analysis, enabling its debate from the perspective of several subjects. Some examples of these concepts are citizenship, ecological sustainability, human rights, justice, conflict and cooperation and social justice, among many other different possibilities</p>
Evans et al. (2012) and Kennelly et al. (2012)	Teachers' preparation	<p>Before trying to instigate any critical and sustainable thinking into children, it is necessary to invest in teachers' training since they are the main characters within the school environment who will interact with children in the search for EFS objectives, and, oftentimes, they are not sufficiently prepared for that when, for example, they do not have a sufficiently deep and wide conception of sustainability and sustainable development</p>

### 3 Methodology

#### 3.1 Research description

The research's paradigm, which was adopted for the accomplishment of this study, is interpretative (Burrell and Morgan 1979; Merriam 1998). This qualitative research was considered the most appropriate type for the development of this work, since the "qualitative researchers try to understand the phenomena that are being studied from the participants' perspective" (Godoy 1995, p. 63).

The present study was developed from a phenomenological approach. Phenomenology is an investigation strategy (Creswell 2003), which is suited if the research's interest lies on the comprehension of a given phenomenon (Merriam 1998), that is, on the comprehension of everything which can be expressed, unveiled, and shows some awareness of the subject who questions. This phenomenon is an object of phenomenological investigation which tries to clarify its meaning. It aims at radically breaking up with the positive certainties which populate the common sense's 'ingenious' conscience. This break-up is the phenomenological decrease which places the "here and now" situation on the spotlight in order to be comprehended when it highlights the founding treats of an essence (Bruyne et al. 1974). It concerns the study of consciousness and of the objects of consciousness, also called conscious experiences or even calls of perception. These objects, experiences or perceptions can be typified as things, images, fantasies, deeds, relationships, thoughts, events, memories and feelings, among others (Bruyne et al. 1974).

According to Merriam (1998), even if the notions of phenomenological experience and comprehension undergo every type of qualitative research, the phenomenological study has its own characteristics, which make it different from other types of qualitative researches, such as (a) 'self-awareness', in which the researcher needs to abstract personal attitudes and beliefs about the investigated phenomenon (Merriam 1998); (b) perception appreciation; (c) social constructivism, which implies that knowledge doesn't lack interest, is not apolitical nor exclusive of aspects that are effective and incorporated into the human experience; it is somehow ideological, political and permeated by values (Bruyne et al. 1974); and (d) 'the things per se', since phenomenology seeks the interpretation of a world through the individuals' awareness based on their experiences, among others.

Therefore, this work faces a phenomenological perspective which values the subjective consciousness as a retrospective reflection that interprets and creates reality, according to a process of 'typification' (Cohen et al. 2002), through which the individual uses concepts or interpretative, taught schemes that recall the "ideal types" which represent a 'constellation' of casual-meaningful connections that explain a social phenomenon (Bruyne et al. 1974), directly captured by researchers from a direct contact with them (Cohen et al. 2002). In this collection, the accomplished phenomenological research involved the study of a small number of individuals through an extensive and prolonged engagement as a procedure in order to develop patterns and meaningful relationships, ignoring multiple data collection techniques (Moustakas 1994).

#### 3.2 Research's individuals

A case study was the research method used. This is a phenomenological typology and concerns an approach in which the object is an in-depth analysis unit (Bardin 2011) and whose

research techniques are, mainly, interview and observation (Cassell and Symon 2004). Case studies are especially suitable for the exploration of processes and behaviours which have a limited comprehension and try to examine a contemporary phenomenon in its context by emphasising its meaning to all the parties involved (Merriam 1998), as it is the case of practical analyses of education for sustainability developed within the environment of a specific Brazilian primary school, which is one of the central goals of the present research. Therefore, this case study in an intensive description and an analysis of a phenomenon or a social unit, such as an individual or group, an institution or a community. It can also be performed with one single individual as the object.

According to Yin (2003), case studies do not need to have a full or accurate account of real events, but the objective to establish a discussion. To Bauer and Gaskell (2000), the strong points of this type of investigation are: (a) it has an important role in the advancement of a field's knowledge base; (b) it explains meanings which expand its readers' experiences; and (c) it offers a way to investigate complex social units which consists of multiple variables of prospective importance in the comprehension of the phenomenon.

The school that is the object of this study was founded on 12 May 1980. According to the current principals, the school came to be with a focus on methodological innovation. This school was chosen to be this research's locus because it fosters a compromise with a person's full education and with the development of critical sense and autonomy of its students, as well as because all throughout the year of 2016 the school adopted a motto in order to guide every educational activity, defined as "Our planet, our home", through which several activities turned to Education for Sustainability were developed.

Data collection started in August 2016. At that time, and according to the school board, the school had 300 students regularly enrolled, 189 of which were in primary school, which comprehends years 1 to 5.<sup>1</sup> Concerning this research's subjects, they are 2nd, 3rd and 5th graders from primary school, as well as teachers in the respective years and the school principal. Each grade mentioned has 26, 17 and 26 students, respectively. Most of them took part in the interviews, except for those who missed class on their development day or those who didn't want to join, since it was voluntary participation. Nine students from each grade were selected through a draw in order to take part in the interviews.

The definition of 9 students as the number of participants per grade was due to the understanding that this would be this highest possible number of students to enable the realisation of the interview, because of the time limit imposed by the school for the accomplishment of this activity and the limits of the researcher to hear and interview a higher number of students in such a short period of time.

First and fourth graders were not able to take part in the interview because they had no authorisation from the school due to the fact they were already taking part in another research. However, it is believed that this fact will not undermine this research's results, since students from classes which represent the beginning, the middle and the end of primary school years participated.

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<sup>1</sup> In Brazil, primary school encompasses students between 6 and 10 years old, from 1st to 5th grade. As the educational system changes from country to country, like in the UK, where the same age group encompasses students from 2nd to 6th grade, and for technical reasons, this research will follow the Brazilian classification.

### 3.3 Data collection

Data collection took place between August and November 2016.

In order to enable the collection of data, a meeting was held with the school principal, supervisor and teachers, during which the research was presented and data collection operationalisation was set.

Overall, the researcher spent around 4 months in the research field, or 27 h and 42 min, in net hours.

With the objective to describe how the research was carried out, the data collection steps will be presented below.

#### 3.3.1 Direct observation and field notes

Direct observation as a participating viewer was the observation technique used and it followed typologies by Gold (1958) and Merriam (2009). Through this technique, the interviewees know the researcher. However, this has no purposeful interference in the group's activities.

Data collection by direct observation was carried out through follow-up and observation of the development of the "Good afternoon!" program activities, which is an action systematically developed by the school with the objective to integrate students with the environment so they can develop their concepts in relation to sustainability in its most holistic form.

All the students from the three grades investigated, plus 4th graders, took place in this activity, which happened during school days before classes, specifically from 1 p.m. to 1:30 p.m. During the process, teachers, principals and supervisors let go of several teaching resources, such as songs, texts, plays and games, with the objective to reach the goals suggested.

This way, through the observation of the interaction between students and teachers, principals, supervisors and the environment during the activities developed in the process mentioned above, the objective was to collect data which could help in the process of identification and analysis of how the school has developed practises related to the topic about sustainability, and how these practises can be improved, thus contributing to attaining this research's objective.

#### 3.3.2 Interview with 2nd, 3rd and 5th graders

Due to the time limit imposed by the school principal for the realisation of interviews with the students, and with the objective to cause the minimum impact possible during the course of classes, group interview or focus group interview, suggested by Merton et al. (1956), was the type of interview adopted in this study. According to Patton (2002) and Flick (2009), a group interview or focus group interview, is the one during which, due to time-saving issues and resources, meeting with individuals to be interviewed in small groups is the choice made. During a certain period of time, these individuals answer questions about a specific topic.

It should be mentioned that, according to Patton (2002), even though this data collection method somehow resembles another very famous one, which is the focus group method, both of them have a key difference. Patton (2002) argues that, as in the focus group, the

objective is to obtain data from the discussion of a certain topic by individuals. This is not the point in the group interview, although there could be some interactions between the interviewees. The point here is still to collect opinions of each interviewee, and not the data that come from possible discussions on the topic, that is, although it is developed in a group, according to Patton (2002), group interview is still an interview.

One of the main factors that led to the choice of this type of interview, besides the time limit imposed by the school, was the attempt to provide a more comfortable interview environment for the students, since they were children, and it was assumed that they would feel more at ease to talk to the researchers under such conditions if they were joined by their peers. This proved to be assertive during the realisation of the interviews since it was possible to see that the fact the interviews were carried out in groups of three students at a time made them feel very comfortable to answer the questions, which is believed it would have been harder under the individual interview model.

The group interviews happened the following way: at first, the researcher introduced himself and the research to the students of each school year, in different days, times and places. Then, he explained how the interview would be done and started it.

The 09 students that were drawn from each grade to take part were taken by the teachers in groups of three to another room, where they met the researcher and an assistant who held a video camera with the objective to assist with recording the interviews. As they entered the room, students were welcomed and the group interviews began.

The interviews happened through talks along which a series of questions on the topic were made. As soon as the interview was over, the students returned to class and called out the next three students who would participate. The cycle was repeated until three groups of three students per class had been called out.

The interviews followed a semi-structured script, adapted from Farias (2016), who carried out a research with similar objectives on a higher education level.

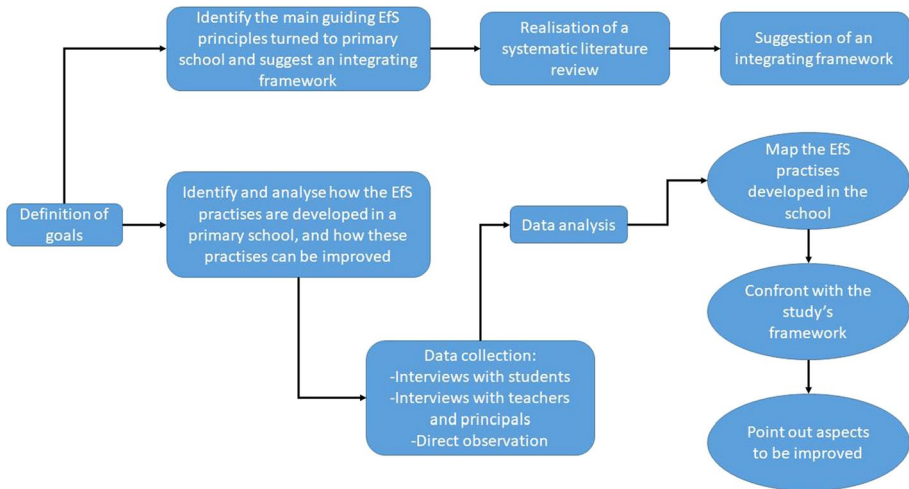
### 3.3.3 Interview with the principals, supervisors and teachers

The interview with the principals and supervisors happened on the first day of data collection and followed the group interview patterns (Merton et al. 1956; Patton 2002; Flick 2009), which was described in the previous topic. Besides, it was a non-structured interview that took place in the principals' room. As previously mentioned, no interview script was used and the interview questions were about how the school developed its practises of education for sustainability.

The interview with the teachers was done in November 2016 with teachers from the 2nd, 3rd and 5th grades of primary school at the school's library. Only the teachers and the researchers were present at this moment. The interview also followed the group interview structure (Merton et al. 1956; Patton 2002; Flick 2009). It was collective and in turns, so that all the teachers took part in the interview together, that is, the semi-structured script questions were done alternately between the teachers. Moreover, it was guided by a semi-structured script, adapted from Farias (2016).

## 3.4 Data analysis

With the objective to reach the second goal of this research, the interpretative analysis method was used. It enabled the data that came from the interview with 2nd, 3rd and 5th



**Fig. 1** Research's design. *Source:* Elaborated by the authors, 2019

graders, from the interview with the principals, supervisors and teachers, and the direct observation and field notes to be analysed.

At first, the students' names were coded with the objective to safeguard their identities. For such, the following coding system was created: **GYCXSZ**, where **G** means grade, **Y** means the student's grade number, **C** means class, **X** means the number of the student's group in the interview, noting that there were three groups by class, **S** means student and **Z** means the student's sequence number.

The analysis happened by reading the interviews' transcriptions with the children and with the teachers by using a guiding question: What do these accounts say about how Efs activities are developed in this school? From selected passages through the guiding question, two tables were created. One shows which Efs practises are developed in the school from the children's perspective, and the other one shows the teachers' perspectives. With the objective to contribute to mapping out which Efs activities are developed in the school, selected passages from direct observations carried out at school were added to the students and teachers' lines along with the principals', who also dealt with this question.

Figure 1 shows a holistic view of this research's steps, summarising the main procedures adopted in order to enable this study's objectives.

## 4 Results' introduction, analysis and discussion

### 4.1 Results' introduction

The results presented in this section were summarised into two tables. Both of them aim at highlighting which and how the Efs practises are developed at school from the students and the teachers' perspective, and whose analysis tries to check and guide the alignment of such practises to the specific Efs principles for primary school, identified and presented in this work's theoretical framework.

**Table 2** The EfS practises developed from the students' perspective. *Source:* Elaborated by the authors, 2017

Grade	The main activities pointed out by the students	
2nd	G2C1S1	Cantonment and a ride to Bica (zoo)
	G2C1S2	A ride to Bica (zoo) and the song 'Mother Earth'
	G2C1S3	Watch a movie about endangered animals
	G2C2S1	Games with patchwork
	G2C2S2	Game: Streets and Alleys
	G2C2S3	Game: Dodgeball
	G2C3S1	Cooperative games
	G2C3S2	A ride to Bica (zoo)
	G2C3S3	Camping and dancing games
3rd	G3C1S1	Puppet theatre
	G3C1S2	The generating topic
	G3C1S3	Rides in general, a ride do Bica (zoo), a ride to the beach and the generating topic
	G3C2S1	Selective collection
	G3C2S2	Selective collection
	G3C2S3	Games: Tag, hide-and-seeK
	G3C3S1	A ride to Bica (zoo), to the Peace square, cantonment and exchange letters
	G3C3S2	A ride through the city, write a book, collect waste and exchange letters
	G3C3S3	A ride to the Peace square and exchange letters
5th	G5C1S1	Incentive to selective disposal, gardening, the Good Afternoon program, class-room activities and talks, theme rides connected to school subjects
	G5C1S2	A ride to Bica (zoo), to a resort hotel, gardening, selective disposal
	G5C1S3	Gardening
	G5C2S1	The Good Afternoon program
	G5C2S2	Cooperative games
	G5C2S3	The Good Afternoon program and its games
	G5C3S2	A ride to Bica (zoo), e-games and the Good Afternoon program
G5C3S3	Group activities of mutual help	

**Table 3** The EfS practises that are developed from the teachers' perspective. *Source:* Elaborated by the authors, 2017

Teachers/grade	Main activities pointed out by the teachers
2nd Grade teacher	Pedagogical fair, reflection on the 17 global goals suggested by UN to be met by 2030, more specifically goal number 4 (Quality Education). Work turned to retrieving the North-eastern culture through the St. John festivities, the Good Afternoon activities and, lastly, the teacher emphasises that sustainability is crafted transversally in every school subject
3rd Grade teacher	Also points out the pedagogical fair and the reflection on the 17 global goals suggested by UN to be met by 2030. Also states that sustainability is crafted transversally in all the school subjects, in a way it goes on daily. Lastly, the teacher explains that, during the year 2016, they sent a letter to two city councillors demanding several sustainable practises
5th Grade teacher	Pedagogical fair, reflection on the 17 global goals suggested by UN to be met by 2030, more specifically goal number 3 (Good Health and well-being). A constant reflection in the classroom about the need to respect one another

During the interviews with 2nd, 3rd and 5th graders from primary school, and with the respective teachers, several questions were made with the objective to map out which EfS practises are developed in the school. This way, the data in Tables 2 and 3 were summarised based on the children and the teacher's talks during the interviews.

## 4.2 Results' analysis and discussion

In this section, the EfS practises developed by the school researched will be confronted with the 14 specific EfS principles of education for sustainability in primary school, which were identified through a systematic literature review performed in this research. This section will also present the topics concerning the theoretical framework.

Concerning the observation of the first specific EfS principle in primary school, which is the adults–children methodological differentiation, defined by Kjörholt (2012), even though it is not possible to identify such adherence through the analysis of the activities pointed out by the teachers, it is possible to notice, through the children's analysis, that the school works with differentiated methodologies with the primary school students, as pointed out by Kjörholt (2012) to be necessary for the EfS effectiveness.

Activities such as games with patchwork, streets and alleys, dodgeball, cooperative games, dancing games, puppet theatre, Good Afternoon games and e-games, among others, are present in several students' talks, from every grade investigated, as follows:

**G2C2S1:** [...] we used fabric. There was some blue fabric, and there were... a few green patches. We scattered them on the floor with the blue pieces, I placed the green ones on the border and then it "reminded me" of planet Earth.

**G3C1S1:** [...] they took the black puppets over there to talk about something, like, that can't exist... racism... they are all (*inaudible*). They are people, they are living beings. And it was cool... we had some presentations.

**G5C2S2:** [...] It may be in the cooperative games because everyone has to cooperate with each other, right?

These activities allow the children the possibility of learning playfully about sustainability and sustainable development, which is of fundamental importance for the EfS success with children, according to Kjörholt (2012), for, although the principles of sustainability are the same for adults and children, the latter ones have ways of learning that are different from the way adults absorb knowledge, and, thus, they need differentiated methodologies. This way, the suggestion is that the school which is the subject of analysis keep on offering their students such methodological differentiation.

Moreover, it became evident that the school follows two other important specific EfS principles for primary school, which are: "understanding children as changing agents", suggested by Davis and Elliott (2014), and "children should not be underestimated", defined by Engdahl (2015).

According to Davis and Elliott (2014), in order for the EfS practises to succeed, it is important that the educators see children as citizens and as changing agents who influence their families and will take important decisions in the future. Additionally, Engdahl (2015) states that children and their capability to understand and practise sustainability should not be underestimated, for this may impair such an early and important EfS.

One of the activities which highlight the observance of these principles by the school is the continuous children reflection about the 17 global goals of sustainable development



suggested by UN to be met by 2030, for, as this action is suggested, the school shows it sees its students as agents who are able to incorporate such goals and who can act in a way to contribute to its implementation by not underestimating them. It is important to emphasise that having such a point of view is important for the EfS success, and that the school must be vigilant to make sure this conception lasts.

According to Davis (2008), Engdahl (2015), Jenkins (2015) and Jensen (2002), besides seeing children as changing agents and not underestimating them, observing the principle of children as main actors of EfS practises is also necessary for its success, since it defends that students should gradually take the leading role in the idealisation and promotion of EfS activities, no longer as passive agents, which is common in traditional processes of education where children are seen as empty recipients that need to be filled with knowledge. This will also help them take on a constructivist lead, from which students build the classes together with their teachers.

In this sense, besides the fact it was possible to notice that the teachers see the students as changing agents and don't underestimate their capability of assimilation and practises of EfS content, it was possible to see that the children take on an active role in most of the EfS practises developed in the school, such as cantonment, games with patchwork, streets and alleys game, letter exchange, gardening and group activities with mutual help, among others. According to Davis (2008), Engdahl (2015), Jenkins (2015) and Jensen (2002), this is of fundamental importance. However, during the interview, as well as during the direct observations done by the field researcher, no teachers and no students stated that these activities had been suggested by the students themselves. They had actually been fully idealised and implemented by coordinators and teachers, whereas the students executed the practises suggested, which can discourage them.

This way, here is the suggestion that, besides making the students take part in the activities of education for sustainability, which has been done, the school should have the coordinators and teachers gradually share the task of idealising EfS activities with the students, always taking into account the recommendation by Davis (2008), Engdahl (2015), Jenkins (2015) and Jensen (2002), and that this sharing should be done gradually as the teachers notice the students' interests in taking on the main role. This, according to the authors, will motivate them even more to carry out the practises suggested.

Another EfS principle turned to primary education is the one suggested by Engdahl (2015) and Busatto (2015). According to this principle, the EfS practises developed on this teaching level tend to focus solely on the environmental aspect of sustainability, relegating the two other basic grounds of sustainability, the social ground and the economic ground, and this must be avoided by principals and teachers, with the objective to avoid a step back in education for sustainability for a disciplinary and limited model of environmental education.

In this regard, and even though the EfS practises have already been assessed in this work as being developed in a range that is wider than the traditional and limited models of environmental education due to the existence of several practises that enable contact with children who also face social problems, it is now evident that, because of the lack of practises, the EfS developed in the school doesn't take into account the economic dimension as a component of the sustainability grounds, keeping them away from children with sustainable problems that are more complex and similar to real life and which are, at least, influenced by the economic, environmental and social dimensions, besides several others that are even more specific.

This way, here is the suggestion that the school should try to integrate the economic dimension to its EfS practises, with the objective to prepare the students through activities

that simulate the complexity of decision-taking processes which pervade a sustainable individual's life as much as possible.

The sixth main specific EfS principle in primary school is that of materiality in school grounds, suggested from directions by Green and Somerville 92015. According to this principle, EfS practises are moulded by the conditions offered through the school's physical space, the resources it has, and the way through which the teachers use this space and these resources.

Concerning this principle, it is understood that, by analysing the EfS practises pointed out by the students and the teachers, as well as through the direct observations done by the school researcher during the development of several EfS activities, the institution's infrastructure is suitable to the smooth development of EfS practises, since it has a large number of classrooms, laboratories, a cafeteria, a kitchen, a wide multi-purpose court (where several EfS activities take place, including the Good Afternoon program), a playground, a green area, a library, and a TV and games room, besides several types of resources for the development of playful activities with children, such as paper, paints, brushes, cardboard, sports gear and several other items that are necessary for the good development of EfS practises.

Finally, through the number of EfS practises developed by the teachers, some of which are shown in Tables 2 and 3, and through the way how these activities were developed, it was possible to see that, by fully using the space and the resources available at school (direct observation), the teachers wisely use the material conditions made available by the school for the development of EfS practises. Concerning this issue, here is a suggestion that there should be a place to develop gardening activities, as it was frequently mentioned by the children.

**G5C1S1:** [...] Once we had an activity when we planted some stuff, a little plant [...]

**G5C1S2:** [...] we also planted little things like this, and we also saw those litter bins [...]

**G5C1S3:** [...] we planted the little seeds, we scattered some pebbles... then we had the plants here in the back.

The gardening area, in turn, was not observed by the researcher along the 4 months of field research.

Another specific EfS principle to primary school, which also focuses on material conditions available in the extra-school context, is the one about connections with local places, defined by Green and Somerville (2015), Norddahl (2008) and Engdahl (2015). It was possible to see that, from the EfS activities pointed out by the students, the school is playing according to this principle, since several EfS activities were catalogued by the children in their talks.

**G2C1S1:** [...] Cantonment and Bica also. Cantonment because it was cool, we made more friends, we played more, we made some paper planes, we wrote some friendship words, friendship [...].

**G3C3S1:** [...] we go to the beach, we go to Bica [...] Also, there was that day when we walked around Peace square and came back [...].

**G5C1S2:** [...] we went to Bica, then we walked all around it, like, many things, animals, plants and stuff like that [...] we went to the resort hotel [...].

In short: Cantonment and the ride to Bica (zoo); a ride to the beach, a walk around Peace square; a walk around the city; theme rides connected to school subjects; and a ride to a resort hotel. All this shows that the institution is working on EfS beyond the school walls, using other contributing, accessible spaces that are in accordance with the area, thus providing a wider range of pedagogical experiences to its students and widening the impact of EfS activities.

In this sense, here is a recommendation that the school should keep on using the extra-school spaces which may contribute to the success of two EfS activities. It is also important to mention that the coordination and the teachers should define the school rides with the objective to enable students' contact with the largest possible variety of spaces.

Concerning the eighth principle, which addresses the issue of partnerships with the community, as suggested by Green and Somerville (2015) and which recommends that the school should try to make partnerships with other social actors who may add value to the EfS activities developed by the teaching institution with the objective to turn the learning moments into something more meaningful, it was possible to see that only one activity included partnership with social actors beyond school, which was writing and sending letters demanding sustainable practises to two city councillors. This was reported by 2nd and 3rd grade teachers during the interview.

**2nd grade teacher** [...] Through this letter, the school reached even some public authorities.

**3rd grade teacher** [...] "Demand from the city councillors the actions we wrote in the letter." [...]

This shows that, despite the relevance and impact of the partnership made with the city council, the school is still taking its first steps when it comes to this principle. However, it can and must search for other different partnerships which may benefit its EfS practises' quality.

Some other social actors that can be contacted by the school are: the city hall, state and local environment protection organs, companies that stand out in relation to their sustainable attitude in the city, and banks, among others.

Concerning the principle of promotion of real communal experience for children, suggested by Norddahl (2008) and Engdahl (2015), which states that the EfS activities must promote reunions between students with different people and their culture, with the objective to instigate respect to differences, it was noticed that there is only one action in this sense of practises pointed out by the students, which is the puppet theatre.

**G3C1S1:** [...] they took the black puppets over there to talk about something, like, that can't exist... racism... they are all (*inaudible*). They are people, they are living beings. And it was cool... we had some presentations.

However, it should be mentioned that even this single experience of approaching what is different was not a real approach but only a theatre performance. It is important to highlight that games and activities that enable contact among the students are also relevant to encourage the respect to differences, since, within the same school, there are children from different cultural backgrounds, ethnicities and beliefs. Yet, with the objective to have a greater adherence to the principle suggested by Norddahl (2008) and Engdahl (2015), the school must take a step forward in the sense of planning activities that enable the contact between children and people with a cultural background that is

different from theirs as much as possible, so that they can realise the amplitude of cultural diversity in the world and start to understand the richness this diversity holds.

Most of the times, it is neither necessary nor possible for the school to develop high-cost activities to adhere to this principle, such as trips to distant places. Actions like inviting people from different regions and who live in the city to talk to the children about their beliefs, their culture and the ways they see the world, or, in major cities, walks through different neighbourhoods that are predominantly inhabited by immigrants. These can be some more achievable alternatives in order to promote the experiences guided by this principle.

Norrdahl (2008) and Engdahl (2015) suggest that, before asking children to respect nature, they should be able to know it, since many of them were born in urban areas that have little contact with nature, which, in turn, becomes unknown to them. Therefore, they do not respect it. This is the tenth specific EfS principle for primary school, suggested by Norrdahl (2008) and Engdahl (2015) in this research, that is, that the EfS activities may enable the promotion of a real environmental experience for children.

From the children's talks during the interviews,

**G3C1S3:** [...] We always do the tasks about sustainability. Sometimes they are connected to the rides we have at school [...] Bica (zoo), we went to the beach. [...]

**G5C1S3:** [...] we planted the little seeds, we scattered some pebbles... then we had the plants here in the back.

It is possible to identify a series of rides and activities: a ride to Bica (zoo); camping; a ride to the beach; gardening and the ride to the resort hotel. They show the school's participation to what was initially suggested, since they all enable the children to be in touch with nature by allowing them to feel as if they are part of the environment, so that they may have the desire to protect it as if it were an extension of them. Therefore, in this aspect, here is the suggestion that the school should keep on organising such meetings between children and nature with the objective to give them a real meaning of their efforts to be sustainable.

Although it is similar to the previous principle, in that it focuses on children's contact with nature, the eleventh specific EfS principle for primary school, catalogued in this research from Norrdahl (2008), Engdahl (2015) and Green and Somerville (2015), and defined as the principle of promotion of understanding how nature works and where our resources come from, it surpasses this contact and defends that children must understand how nature works and that it is the provider of all the resources that are necessary for our welfare.

Through the analysis of the practises pointed out by the children, it was possible to identify activities that encompass the direction of this principle. They are gardening activities and the ride to the resort hotel, for, through them, the children were able to have an idea of plant development and of the lives of the animals that serve them as nourishment, to name a few. This way, here is a recommendation that the school keep on investing on this type of activity with the objective to enable the students with a deeper understanding of nature and of its limits. Composting experiments for children is another suggestion.

All the principles of education for sustainability so far presented and discussed are extremely useful for the success of EfS processes in primary school. However, the principle of creative processes and children's critical view development, formulated from Norrdahl (2008), Green and Somerville (2015), Davis (2015), Jenkins (2015) and Jensen (2002) must be highlighted. This principle defends that EfS must use processes which challenge the traditional pedagogies, and gives up the innovative use of available resources with the objective to train children to analyse interdisciplinary problematic issues that involve

social, environmental and economic aspects, create solution alternatives to these questions on their own, and to be able to critically take decisions on more sustainable alternatives for the solution of the problems presented.

However, despite the vast number of practises pointed out by the students and by the teachers, as well as the direct observation done by the researcher about several of these areas, there was no activity that observes the guidelines of this principle in the school, and this is one of the main implementation recommendations within the scope of the EfS developed by the institution, due to its high potential and promotion of critical, interdisciplinary and sustainable thinking, since it enables the simulation of real, interdisciplinary and complex problems which the children will have to face later on. In order to facilitate the implementation of this type of activity, here is the suggestion to adopt the action competence approach by Jensen (2002), which is detailed in this paper's theoretical framework.

The penultimate-specific EfS principle to primary school, which is transversality and rich concepts, defined from Jenkins (2015), is different from the generic EfS transversality principle (Coelho et al. 2018), for, besides considering that EfS must be developed transversally along every other school subject, and not separately, it shows the use of the so-called rich concepts in order to facilitate this integration with school subjects.

According to the author, rich concepts are broad, transversal and multi-faceted topics, rich in possibilities when it comes to critical interdisciplinary analysis, enabling its debate through the perspective of several school subjects, so that, through the EfS activities' analysis pointed out by the teachers, it was possible to identify the use of rich concepts in order to facilitate the EfS transversality. These concepts used by the school come from the 17 global goals suggested by UN in order to promote a sustainable development which must be met by 2030.

**2nd grade Teacher** [...] It's about the pedagogical fair we had last week. In my case, we worked on goal number 4, out of the 17, and mine was Quality Education [...]

**3rd grade Teacher** [...] in my group I worked on disclosure, on presenting the 17 goals. But something I said today in the Good Afternoon program, and which I found very important, is: working on the 17 goals for us here at school, working on sustainability, no matter if UN introduced this now, is something we breathe here, something that follows our daily routine. [...]

**5th grade Teacher** [...] An activity we performed about sustainability, something that is very fresh in our minds, is the pedagogical fair, where we effectively worked on the 17 goals. I worked on goal number 3 (Good Health and Well-being), and that was a very intense moment of reflection with the class. [...]

Therefore, it is possible to see that the school adhered to the principle of transversality and rich concepts, which are very relevant in order to enable EfS transversality along with other school subjects.

Lastly, concerning the last specific EfS principle for primary school, teachers' preparation, designed from Evans et al. (2012) and Kennelly et al. (2012), which defends that, before worrying about the students' sustainability training, the school must turn its attention to the teachers' training, for their level of comprehension about the topic will certainly influence the extension of children's comprehension.

In this sense, the existence or the lack of these trainings was not clear in any moment during the interviews with the teachers. However, something that was emphasised during the interviews is that, even though the teachers showed a great effort to work on the theme with the students the best way possible, both in the interview and in their daily practises,

**Table 4** Evaluation of the EfS actions developed in the school which were investigated based on EfS fundamental principles. *Source:* Elaborated by the authors, 2019

Guiding principles of the EfS practises in primary school	Evaluation of the adherence of EfS practises developed in the school investigated to each principle of the framework suggested		
	Fully agree	Partly agree	Not practised
Adults–children methodological differentiation	X		
Children as changing agents	X		
Children should not be underestimated	X		
Children as leaders of EfS practises			X
The environmentalist bias should be avoided		X	
Materiality of school grounds	X		
Connections with local places	X		
Partnerships with the community		X	
Promotion of real communal experience for children		X	
Promotion of real environmental experience for children	X		
Promotion of understanding how nature works and where our resources come from	X		
Creative processes and children’s critical view development			X
Transversality and rich concepts	X		
Teachers’ preparation		X	

they don’t envisage the economic dimension as a component of sustainability and sustainable development. This is believed to reflect on the lack of EfS practises that encompass the economic aspect, something pointed out by teachers and students, and which was also identified in this analysis. It is also believed that explains the results achieved concerning the students’ sustainability concepts. Most of these students don’t envisage the economic aspect as one of the sustainability dimensions as well.

Consequently, due to the need the teachers should have deep knowledge about the topic, and due to the gaps identified, here is the suggestion that the school should enable ways for the teachers to continuously train about the topic, which can be done through low or no-cost Distance Learning (DL) programs and by establishing a weekly schedule that can be supported by the teachers’ workload, where they can dedicate time to research about the topic, among other possible alternatives.

After confronting the EfS practises developed by the school with the EfS principles identified in this work, an adequacy analysis between the practises and principles was performed. It aimed at checking the EfS practises’ adherence to the guiding principles. In each principle, there was the indication of how the EfS practises are following it. This adherence was described through three possibilities: fully agree, partly agree and not practised in order to facilitate the identification of the points which need to be kept, those which need to be expanded and, then, those which need more attention from the school.

Table 4 is designed with the objective to summarise the EfS practises’ adherence developed by the school investigated and the fundamental EfS principles in primary school. X means the level of adherence between the EfS practises developed in the school and the principles which compose the framework suggested in this study.

The EfS practises developed by the school were evaluated as being fully in accordance with 08 out of the 14 EfS principles discussed in this paper, which means that, concerning

them, the school should be constantly vigilant in order to keep acting according to their guidelines.

It is also possible to notice that, in relation to the other 04 principles, the school partly meets them, that is, although it was noticed that the school is already putting meaningful efforts into its direction, it is still necessary to improve the practises so as to bring them closer to the principles' guidelines.

Lastly, it was possible to see that 02 principles were evaluated as not practised by the school and, even though only 02 principles were identified in this implementation step, they are extremely relevant to the success of the EfS practises, both for the creative processes and the children's critical view development and for the one concerning the establishment of children as leaders of EfS practises.

## 5 Final remarks

Concerning this study's first main goal, which is to identify the main EfS guiding principles turned to primary school and suggest an integrating framework through a systematic literature review, it was possible to see that, even though there is a vast range of principles and foundations suggested to ground such practises, they were still severely dispersed, published in different countries and continents, and came from experiences all over the world. The review also highlighted that few attempts were made in order to suggest approaches which aimed at aggregating these experiences and learnings into an integrating framework, which is able to minimally guide the development of EfS practises on this teaching level.

Therefore, the framework suggested in this study, which is composed of 14 guiding EfS principles turned to primary school and developed from international literature review that reached studies coming from several parts of the world, comes up as an initial proposition in order to guide the EfS practises on such teaching level. This proposition needs improvements through dialogues with those who practise research and education for sustainability in primary school.

Concerning this research's second main goal, which is to identify how education for sustainability is developed in the school that is the object of this study, and how the EfS practises developed in this institution can be improved through the results and analyses presented, it was possible to identify that the school is in full accordance with 08 out of the 14 EfS principles raised through the literature review developed in this work, meets 04 other principles partly, and 02 others have not been met yet.

As for the 08 principles, the school has been following, there is only suggestion, which is to keep constant vigilance in order to keep acting according to their guidelines. Concerning the 04 principles, the school is not in full accordance with, and even though it was possible to see that the school has employed meaningful efforts in their management, the practises still need some improvements, so as to make them more adherent to the principles' guidelines. In relation to the 02 principles, the school doesn't follow, and even though only two were identified in the implementation steps, they are extremely relevant for the success of the EfS practises. This way, special emphasis must be given to the observance of these principles, which are: the creative processes and the children's critical view development process, and the one referring to establishing children as leaders of EfS practises.

With the objective to contribute to the improvement in EfS practises in the school researched, besides the evaluation of how they have been developed overtime in the topic

that refers to results' introduction and analysis, alternatives for the improvement in such practises were also pointed out.

Among the improvement suggestions pointed out, and due to the relevance of this principle and the lack of school adherence to it, the adoption of an approach of action competences by Jensen (2002) should be emphasised, with the objective to enable a stricter adherence to the creative processes and the children's critical view development, which aims at enabling them to analyse interdisciplinary problematic questions that might involve social, environmental and economic aspects, generate resolution alternatives to these questions by themselves, and be able to critically take decisions about more sustainable alternatives for the solution of the problems presented.

The main limitation identified in this research was the fact it was not possible to have 1<sup>st</sup> and 4<sup>th</sup> graders join the study. However, it is believed this fact didn't undermine this research's results, since it had the participation of students who represent the beginning, the middle and the end of primary school.

Several other works may be developed with the objective to deepen the findings and the conclusions in this research, such as the accomplishment of a research which tries to identify how education for sustainability is developed in a public school, so that the practises identified may be compared with those developed in the institution researched. As a further suggestion, the development of a research with public and private school managers in order to analyse the sustainable practises adopted in the schools and the role of the school manager in this process.

Finally, one central question which is believed to be of fundamental importance for the progress of EfS in Brazil and in the world and which needs to be discussed: the nature of relationships between environmental education, education for sustainability and education for citizenship, as well as trying to identify the similarities and the differences of their propositions. As an initial idea, education for citizenship may satisfactorily encompass the premises and principles of two other forms of teaching and, thus, it may be understood as one of the most holistic and encompassing forms of human education. However, that will need a dense debate in this respect.

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**Conflicts of interest** The authors declare that there are no conflicts of interest.

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## Affiliations

Arthur William Pereira da Silva<sup>1</sup>  · Ana Lúcia de Araújo Lima Coelho<sup>2</sup>  ·  
Helaine Cristine Carneiro dos Santos<sup>3</sup>  · Alípio Ramos Veiga Neto<sup>4</sup>  ·  
Ahiram Brunni Cartaxo de Castro<sup>4</sup>  · Walid Abbas El-Aouar<sup>4</sup> 

<sup>1</sup> Instituto Federal de Educação, Ciência e Tecnologia do Ceará – IFCE, Av. Dr. Antônio da Rocha Freitas, 1566, Centro, Jaguaruana, CE 62.823-000, Brazil

<sup>2</sup> Departamento de Administração, Programa de Pós-Graduação em Administração (PPGA) e Programa de Pós-Graduação em Administração Pública e Cooperação Internacional (PGPCI), Centro de Ciências Sociais Aplicadas - Campus I, Universidade Federal da Paraíba – UFPB, João Pessoa, PB 58051900, Brazil

<sup>3</sup> Sertão Integration School - FIS R. João Luiz de Melo, 2110 Ernesto Geisel, Serra Talhada, PE 56909-205, Brazil

<sup>4</sup> Programas de Mestrado e Doutorado, Universidade Potiguar – UNP, Av. Engenheiro Roberto Freire – 2184, Capim Macio, Natal, RN 62.823-000, Brazil