

Chapter 11

Environmental Citizenship in Primary Formal Education



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11.1 Characteristics of Primary Formal Education

The concept of ‘primary formal education’ reflects both the schooling period and the type of educational settings. Primary education, as an introductory schooling period, represents an important stage in children’s development. According to UNESCO (2007), this is from the age 5 to 11. From the perspective of Education for Environmental Citizenship, primary education is the appropriate period for laying the foundation of children’s future willingness to actively participate in responsible behaviour at both individual and collective levels. Some studies show that students at earlier ages of primary school are more willing to participate and show better outcomes after educational interventions aimed at developing key values and skills for Environmental Citizenship (Ampuero et al. 2015).

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The concept of ‘formal education’ is, however, less straightforward. Formal education is interpreted as mandatory, usually within a school setting, and delivered by teachers (UNESCO 2012; Patrick 2010; Hofstein and Rosenfeld 1996). According to OECD (2018, p. 1), formal learning is “always organized and structured, and has learning objectives. From the learner’s standpoint, it is always intentional: i.e. the learner’s explicit objective is to gain knowledge, skills and/or competences. Typical examples are learning that takes place within the initial education and training system or workplace training arranged by the employer.”

However, the borders between ‘formal’, ‘non-formal’ and ‘informal’ education are often blurred. Teachers may use both formal and non-formal settings to achieve both intended and unintended educational outcomes; they may apply teacher-centred (instrumental) and student-centred (emancipatory) approaches (Wals et al. 2008) or combine mandatory teaching with free choice activities for motivated students. Because of this, some authors call for a ‘hybrid approach’ (Hofstein and Rosenfeld 1996).

As non-formal education is the subject of another chapter, we focus on learning that occurs as a part of primary education school curricula, and it is delivered by teachers, in school settings.

We focus specifically on the following two questions:

- What are the most important educational goals regarding the development of Environmental Citizenship in primary formal education?
- How can these goals be achieved in primary formal educational settings?

In this chapter, we start with a brief overview of the educational approaches relevant in developing Environmental Citizenship at primary level. Then we discuss the way Education for Environmental Citizenship is promoted by curricular materials. In the last part, we provide specific examples of educational outcomes and relevant methods for developing Education for Environmental Citizenship.

11.2 Education for Environmental Citizenship: Relevant Approaches

The Global Education Monitoring Report (UNESCO 2016) claims that the ‘transformation needed for a cleaner, greener planet’ demands innovative, creative and integrative thinking, and this requires interactive, discursive and experiential teaching and learning (Cotton and Winter 2010; Cotton et al. 2009). But, how should it be operationalised in the context of formal primary school education? What are the pedagogies that better prepare students to actively contribute to a sustainable future?

Studies such as Citizenship Education at School in Europe (2017) reveal the importance of directly linking together critical citizenship and environment. In this line, the approach known as ecopedagogy (Vilches et al. 2016; Misiaszek 2015,

2016; Kahn 2010) advocates a school curriculum linking the teaching and learning of environmental concepts to citizenship education.

From a socioecological perspective, Regula Kyburz-Graber (2013) claims that educational approaches intended at involving citizens in environmental issues should be participatory (an emphasis on collaboration and engagement), constructive (making people participate in the construction of meaning and solutions), critical (questioning the way things are and the way things should be) and reflective (thinking above causes and consequences and how to improve situations).

Along with the use of constructive, collaborative, critical and reflective activities (Kyburz-Graber 2013), classical models for shaping environmental behaviour reveal the importance of variables affecting the sense of ownership and empowerment (Hungerford and Volk 1990) and suggest the need for them to be taken into account when designing educational interventions to promote Environmental Citizenship.

Based on the key elements highlighted above, we can identify some pedagogical approaches with a huge potential to engage pupils in constructive, collaborative, critical and reflective activities while fostering students' sense of ownership and engagement in environmental issues. We cite some of them below:

Service learning is an educational approach that combines educational objectives with community service in order to provide a pragmatic and progressive learning experience while meeting societal needs (López-Azuaga and Suárez Riveiro 2018; Murphy 2008; Wilczenski and Coomey 2007; Golombek 2006). This approach is likely to develop a sense of ownership and empowerment in students, who can take an active part in addressing environmental issues and improving their world around them. Service learning connected to Environmental Citizenship may provide pupils with opportunities to make relevant and authentic contributions to the improvement of local environmental issues, and to act as responsible and responsive citizens.

Project-based learning (PBL) and inquiry-based learning (IBL) are both student-centred pedagogies, which engage students in the development of a project (PBL) or an inquiry (IBL) in order to address a particular problem, while developing understanding of the issue being addressed and acquiring interesting competences (Song 2018; Chu et al. 2016). Through this approach, students may develop environmental projects relating to pollution reduction, waste management, energy saving or sustainable transports and mobility, exercising as citizens, actively committed to the improvement of their local community.

The use of socio-scientific issues or socially acute questions to address environmental problems (Karpudewan and Roth 2018; Morin et al. 2013; Simonneaux and Simonneaux 2012) is another approach where students use reasoning to evaluate different arguments and negotiate positions and solutions to particular problems. In this respect, this pedagogy offers interesting opportunities to discuss different perspectives and conflicting interests and to strengthen students' critical thinking and sense of responsibility for a more sustainable world. The discussion of socio-scientific issues thus provides powerful scenarios to balance benefits and risks, duties and rights and to empower students in the search of fair solutions.

Currently, the discussion about which pedagogies better prepare students to face societal and environmental problems pays considerable attention to transformative

learning as a developmental process, entailing concepts such as construction of meaning in diverse groups (Wals and Lenglet 2016). This is consistent with the use of constructive approaches, interaction with complex real-world learning environments (König 2015) and co-learning (Lotz-Sisitka et al. 2015) in agreement with the use of collaborative approaches.

Action-based and task-based learning are other student-centred pedagogies with a potential to integrate the key features previously mentioned and to promote transformative learning. They are especially useful in the development of pupils' competences and problem-solving skills. Action-based interventions orient students' thinking and action to the achievement of a particular goal and involve critical analysis and reflection. According to activity theory, the activity of the individual is described as "active transformations of existing environments and creation of new ones through collaborative processes" and "meaningfully transforming the world in accordance with ideology-driven goals and agendas" (Stetsenko and Arievidtch 2014, p. 65). Here, human activity is seen as a means to transform and create environments, but also to gain knowledge about the world (Andersen 2017). Similarly, in task-based interventions, learning is planned at the same time that students are trying to solve problematic situations, but in this case, the task can be approached in many different ways, according to students' competence level and motivations. Though action-based learning and task-based learning have been widely recognised as powerful pedagogical approaches, an analysis of curricular materials and teaching interventions for Environmental Citizenship at primary school level has revealed that these pedagogies are scarcely used (Andersen 2017).

We can say that, along with exhibiting the key features discussed before (being constructive, collaborative, critical and reflective), the pedagogies acknowledged provide interesting opportunities to develop ownership and responsibility for environmental issues along with a sense of empowerment as citizens who can actively contribute to improve the world around them.

In looking for effective ways to educate responsible citizens, some authors have applied the principles of positive psychology to design pedagogical interventions (Seligman et al. 2005), advocating the importance of promoting positive emotions, positive traits and positive reference institutions (families, schools and communities). In this line, Ampuero et al. (2015) describes an experience involving 499 primary school students intended to strengthen both affective and cognitive skills through local activities based on the principles of positive psychology, with an emphasis on the exercise of empathy and critical thinking. The intervention involved two big programmes – the 'Life Lab' – where students extended their school activities to their close surroundings (natural areas, gardens, vegetable markets) to improve the quality of life around them and the 'climbing wall' where students had to support and trust each other in order to achieve common goals. The findings showed that the interventions fostered students' collaboration, empowerment and decision-making in local activities and strengthened empathy, care, reflective thinking and personal and collective responsibility for a sustainable future.

11.3 Education for Environmental Citizenship in Curricular Materials

The idea of promoting competence for Environmental Citizenship in curricular materials has been repeatedly supported. Guidelines for excellence published by the North American Association for Environmental Education (NAAEE 2004) recommend that:

Environmental education materials should promote civic responsibility, encouraging learners to use their knowledge, personal skills and assessments of environmental problems and issues as a basis for environmental problem solving and action (p. 4).

The materials should also focus on skills building enabling students to address environmental issues (p. 4). Specifically, learners should be “provided with opportunities to develop a variety of citizenship skills, including participation in the political or regulatory process, consumer action, using the media and community service” (p. 10).

In light of Education for Environmental Citizenship a recommendation to engage students into community-based projects should also be mentioned:

Individual and community strategies for citizen involvement and provide learners with opportunities to practice these strategies through projects they generate individually in their school or in the larger community (p. 12).

From the curricular analysis perspective, such studies as the Citizenship Education at School in Europe (2017) reveal the importance to directly link critical citizenship and environment from a prescriptive point of view. Therefore, the so-called eco-pedagogy (Misiaszek 2015, 2016; Vilches et al. 2016; Kahn 2010) advocates a critical curriculum linking of the teaching and learning of environmental concepts to citizenship education.

However, these recommendations are not always met in curricular materials. The analysis of curricular materials (mainly textbooks) shows how these topics are introduced in the classroom in relation to particular topics and how meanings are presented worked and constructed. Unver et al. (2004) identified gaps in providing information about environmental issues in science textbooks for grades 6–12 in the United States. Other authors found an inadequate promotion of students’ involvement in civic participation in selected textbooks for grades 1, 2 and 8 in Chile (Acuna 2015) and the lack of skills development in environmental education textbooks for grades 5–7 in India (Sarmah and Bhuyan 2015).

Even if the concept of Education for Environmental Citizenship is supported in existing guidelines and curricular analysis, it seems to be often neglected in relevant textbooks.

11.4 Education for Environmental Citizenship: Valuable Learning Outcomes at Primary School

After discussing relevant pedagogical approaches and some literature about curricular materials, we focus on what educational goals should be pursued in order to promote Environmental Citizenship in primary school.

11.4.1 *Shaping Environmental Attitudes and Values*

Raising environmental concern and promoting environmental behaviours should be key educational goals for primary education. Research in environmental sociology and psychology has determined that cognitive and affective measures are important in understanding variations in environmental concern and behaviours (Hansla et al. 2008; Swim et al. 2011; Takahashi et al. 2017). In the specialised literature about environmental education at early ages, the emotional level is represented by shaping children's values and attitudes towards nature. According to Schwartz's theory of universal values (1992, 1994), people accenting values of universalism (as unity with nature, protecting the environment, a world of beauty, social justice and others) tend to prefer more altruistic behaviours than people accenting values of power, achievement or security. While forcing children to accept socially desirable values would be considered as an unethical teaching practice, education for Environmental Citizenship should be able to, directly and indirectly, promote those values to pupils, providing an opportunity for their reflection and consideration.

Affinity with nature, environmental sensitivity and connectedness with nature are frequent concepts in the ecopsychological literature (Cheng and Monroe 2012; Beery 2013; Kals et al. 1999). It is assumed that they form the motivational basis for students' future interest in environmental issues and behaviour (Hungerford and Volk 1990), and so they represent a basic precondition for following-up education for Environmental Citizenship. According to Chawla (1999), frequent, direct and positive experience with nature, together with framing this experience by a reference person (parents, grandparents) valuing nature, plays the crucial role (Kals et al. 1999).

To support this, schools should provide opportunities for pupils to get to the wild and diverse environment during breaks with after-school clubs or residential programmes (Malone and Tranter 2003). An opportunity for unorganised free play in the schoolyard with elements of the 'wilderness', where children may be alone, find their special places and get dirty is important (Sobel 1993; Blair 2009). However, care should be exercised as according to Thomson (2007), adults with a good intention often construct school gardens as a well-organised, safe space, while children perceive their effort negatively as limiting their opportunity to free play.

Therefore, a better approach would be to do things *with* children rather than *for* them. For example, instead of designing a schoolyard for children, do it with them –

invite pupils to participate in planning and reconstructing the school green area (Christidou et al. 2013). This activity may become part of school formal curricula, and it is manageable even with younger pupils. According to Skinner and Chi (2012), perceived autonomy is crucial for pupils' motivation for garden work. In the process of decision-making, they can also develop important competences for active citizenship, such as strategic planning, cooperation with peers or anticipated results of their decisions.

In the Czech Republic, the involvement of pupils in the planning of their school garden is part of the EcoSchool programme. Such a strategy has been applied even in kindergartens. Although some teachers originally questioned the 6-year-old pupils' ability to propose realistic ideas, pupils, being introduced to the age-appropriate method of facilitation, provided suggestions beneficial for both the local environment and their free choice activity in the garden. In addition, the participative approach had a positive impact on their environmental attitudes and feeling of empowerment (Cincera et al. 2015, 2018).

As we could see from this example, formal Education for Environmental Citizenship can be rather student – than teacher-directed. In the above-cited studies, the teacher-directed approach had a lower or even negative effect on students' attitudes and feeling of empowerment.

11.4.2 Skills and Attitudes in Dealing with Environmental Problems

Certain authors maintain that exposing young children to the big, emotionally loaded global environmental problems may lead to 'learned apathy' or 'ecophobia' (Nagel 2005; Sobel 1996). In our opinion, from the age of ten onwards, children are able to individually reflect on sustainability problems in their local environment and in some cases even the global environment. Furthermore, the development of pupils' empathy towards the victims of environmental injustice and providing an opportunity for symbolic help may open a space for follow-up community-based projects in the future.

Such an example is the Global Storylines method that allows pupils to experience various sustainability issues in a safe, play-based environment (McNaughton 2012). However, experience with the Global Storylines also documents the limits of this method. The Global Storylines is based on a method of educational drama play, where, by playing a role, students are confronted with a sustainability issue. For example, students play the role of citizens who must decide if they allow a group of ecological refugees to settle in their village. They are confronted with a risk of water scarcity as a result of increased population and consumption and need to find the best solution for both social and environmental issues.

The method has been implemented and evaluated in a set of Czech primary schools. According to the evaluation, the method proved to have a positive impact

on students' interpersonal competence and on school climate. Pupils repeatedly reflected their empathy towards marginalised or oppressed heroes presented in the role play. However, the impact on their issue awareness or action competence remained limited. One reason was that teachers, concerned with the demands of the method, highlighted its interpersonal level rather than its link to the sensitive issue (Vadurova and Slepickova 2015; Krepelkova 2018).

Again, it supports the importance of a careful, sensitive and age-appropriate approach and not to force pupils into taking bigger steps than they are prepared to.

11.4.3 Ecological Knowledge and Inquiry Competence

While the link between ecological knowledge and behaviour is usually interpreted as weak or non-direct, it is assumed that this kind of understanding may increase the quality of decision (NAAEE 1999; Hungerford and Volk 1990; Hungerford et al. 1980). It is reasonable to propose that students should be able to develop some basic understanding of concepts such as energy flow, food chains and food webs, species interactions and the cycling of materials. These concepts would be preferably learned outdoors either at a schoolyard or as a part of an outdoor residential (a few days long) programmes. As some authors reflect, pupils tend to develop an alternative ecological framework, contradicting scientific concepts (Abdullah 2015). Replacing these frameworks with scientifically more sound concepts may be a challenging and non-straightforward process (Abdullah 2015; Saglam and Ozbeg 2016; Hadenfelt et al. 2016). These environments could also be beneficial for the development of basic pupils' understanding of the nature of science and acquiring basic inquiry skills.

Although this competence seems to be important mainly from the science education perspective, it could form a basis for future environmental literacy-oriented projects. Such an effort is obvious in the GLOBE programme, where students and their teachers participate in data collection and inquiry-based learning activities focused on the analysis of the local environment (GLOBE Czech 2016). While some of the schools limit their involvement with a simple data collection without further analysis (Činčera and Mašková 2009), in other schools, students link their findings with a follow-up community-based action. For example, a group of sixth-grade students from a small school in the Czech Republic analysed data about pollution of a local stream. After the analysis, they organised a collective action to clean it and planned to present their findings to the local municipality.

To link students' investigation with a manageable action outreaching the borders of school provides an important step towards encouraging students to other actions.

11.4.4 Development of Action Competence

In relation to environmental behaviours and key skills for Environmental Citizenship, habits such as energy savings or recycling are worth encouraging and have received high levels of social acceptance. However more general action competences (like cooperation or decision-making skills) are needed to successfully address current environmental problems and the challenges related to an uncertain future (Jensen and Schnack 1997). Cooperation, problem-solving and skills to identify elementary causal links and feedback loops in basic social and environmental systems are key competencies worth developing in this age period, along with the ability to recognise and express values for one's self and others (Wiek et al. 2011).

The most straightforward way for competence development is student participation in real-life projects. Different research across the globe reports on successful experiences when involving primary school students in real-life environmental projects intended at developing their action skills in relation to local issues.

For instance, in the framework of a national programme of education for sustainability in Australia, primary school students worked on a wide variety of projects (planting native reeds at the local lake, creating a community permaculture garden and conducting a trial for a turtle nesting site). Teachers used a specific approach called the 'whole systems thinking' to support students in the development of their projects. Evidence showed that conducting environmental education projects, with an education for sustainability perspective, was an effective, meaningful approach to develop environmental awareness of the whole systems thinking and pupils' social, civic and environmental responsibility for local issues.

Moving from Australia to Africa and in an attempt to build the social capacity to address key environmental issues in Ethiopia, a pilot project was designed to use primary schools as change centres and teachers and students as change agents to bring about positive changes on the biophysical environment. Eleven upper-level primary schools were selected to take part in the dissemination of alternative energy know-how and technologies. The results indicated that participating schools attracted the attention of individuals and community-based organisations, engaging them in the demand and use of alternative energy sources, showing that schools could act not only as centres of dissemination of knowledge about environmental but also a place where skills are developed to seek sustainable solutions to these problems (Dalelo 2008).

In Portugal, a qualitative study was conducted to understand the potential of collective initiatives to empower primary school students to take action in relation to local environmental issues. Participants were 26 third grade students and their teachers. The results showed that the students' engagement in addressing the local issues required them to mobilise their scientific knowledge to support their actions, as well as the development of several other competences. Students became aware that acting is crucial to overcome issues that may persist and impact future generations and that only by engaging in action can change take place (Baptista et al. 2018).

However, the age-appropriateness of such a strategy for primary school pupils must be always considered. For example, the Czech programme ‘The School for Sustainable Development’ is based on principles of place-based education, i.e. linking the school curricula with the local community (Sobel 2005; Stone and Barlow 2005; Smith 2007). In the programme, students from grades 3 to 7 were able to accomplish their projects aiming to improve the local environment (e.g. planting a tree, placing a new bench or dustbin, constructing a table with information about the place). However, they did not deal with any controversial local issues, as the teachers preferred manageable, non-controversial projects that were accepted by the local municipality.

This experience demonstrates the difference between the intended curriculum and curriculum in action – while the programme was presented as issue-oriented, it was delivered in a consensual, non-controversial way. It also documents that engaging primary school learners in dealing with real controversial issues, while recommended strategy for education for Environmental Citizenship (Gruenewald 2008), could bring significant challenges on both students’ and teachers’ competence and thus required appropriate scaffolding and specific teacher professional development (Reis 2014a, b).

11.5 Conclusion

To summarise, the period of primary formal education is a time for building bases for the further development of Environmental Citizenship competence. We discussed the main learning outcomes related to Education for Environmental Citizenship in primary school and drew on the specialised literature to identify key features of effective educational interventions for promoting active, responsible citizens who are deeply engaged in environmental issues. Finally, we presented several pedagogical approaches with a high potential to integrate those key features and comment on some experiences that provide primary school students with the opportunities to become agents of change in their local communities. However, the successful implementation of educational interventions for promoting Environmental Citizenship at primary school required appropriate approaches and specific teacher training.

A closer look at the specialised literature suggests that further research is necessary to better understand how to support Environmental Citizenship from the early ages.

In particular, we suggest three lines of future work necessary to advance research in the field of Education for Environmental Citizenship:

- Identification of successful educational interventions, effective pedagogical approaches and key designing principles for promoting Environmental Citizenship at primary school

- Effective training and professional development to equip teachers with the knowledge, values, skills and strategies necessary to promote Environmental Citizenship at the primary school level
- Research on the contextual factors supporting or hindering the Education for Environmental Citizenship in formal settings

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