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**To cite this article:** Alain Pache, Noémie Gey, Nadia Lausset, Yves Mühlematter, Gilles Blandenier, Philippe Massiot, Francine Pellaud & Philippe Gay (2023): Research approaches in ESD/ESE: reflections of Swiss researchers, Environmental Education Research, DOI: [10.1080/13504622.2023.2225809](https://doi.org/10.1080/13504622.2023.2225809)

**To link to this article:** <https://doi.org/10.1080/13504622.2023.2225809>



Published online: 28 Jun 2023.



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# Research approaches in ESD/ESE: reflections of Swiss researchers

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## ABSTRACT

The trilogy of research approaches presented in this text shows how ESD can be approached in different ways. Framing is crucial to challenge the underlying paradigms in our societies, mixed methods are a necessity to address the complexity that characterises the implementation of ESD in schools, and participatory components are particularly coherent to foster an articulation between academic and practical epistemologies. Finally, Swiss researchers favour collaboration rather than competition, which echoes the issues mentioned in the ESD research literature.

## ARTICLE HISTORY

Received 9 March 2022  
Accepted 8 June 2023

## KEYWORDS

Research; ESD; framing; methods; participation

Proposition for the thematic issue: « Environmental and sustainability education in compulsory education: challenges and practices in Francophone Europe

## 1. Introduction

Switzerland is a federalist state composed of twenty-three cantons that have been sovereign for a very long time in the field of education. However, in 2006, new constitutional articles on the harmonisation of education were accepted by the people with a clear majority of 86%. This means that the authorities have been obliged, since that date, to harmonise certain fundamental elements of the education system throughout Switzerland. Thus, in the 'Harmo5 concordat' of 14 June 2007, Article 3 (paragraph 3) states that 'compulsory education promotes the development of an independent personality, social competencies and a sense of responsibility towards others and the environment. »

In addition to this important shift, which will lead the cantons, and in particular the universities, to work more closely together, it should be pointed out that the principle of sustainable development is well anchored in official texts. It is mentioned in Articles 2 and 73 of the Federal Constitution (1999) and in Article 30 (paragraph 1) of the Federal Law on the Promotion and Co-ordination of Universities (2011). The latter lays down the conditions for accreditation, in particular 'the consideration of economically, socially and ecologically sustainable development in the fulfilment of its tasks'.

The 2017–2020 strategy of the Chamber of HEP<sup>1</sup> then defined ten objectives, including the 'strengthening of political, ecological, social, cultural, technological and economic education'.

Under this point, it is notably mentioned that teachers ‘must be particularly aware of issues relating to education for sustainable development (ESD)’. For example, a recent report by the swissuniversities ESD working group (Baumann, Lausset and Pache 2019) showed that a positive dynamic has been initiated in the HEPs following the accreditation renewal process, following the integration of ESD into regional curricula and, to a lesser extent, following the establishment at international level of an Agenda 2030 oriented towards the sustainable development goals (SDGs). However, the authors find that the integration of ESD varies from one HEP to another, with smaller HEPs generally less active in research, for example. Furthermore, ‘although some steps have been taken in terms of sustainability in the management of HEPs, there is still a long way to go to achieve a ‘whole school approach’ (p. 35).

It’s also important to coordinate the research across the country to enable a coherent and coordinated implementation of ESD. It should also be noted that in Switzerland the HEP are responsible for ESD research and, consequently, for teacher training. Thus, these different reasons encouraged us to write this text.<sup>2</sup>

In this paper we want to reflect on research approaches that are particularly suitable for the ESD/ESE objects. The aim is in particular to identify the elements that bring added value compared to current research. But it is also a question of comparing these approaches in order to envisage, in the medium term, a federative research program on ESD practices to be implemented on a Swiss scale.

The first step will therefore be to draw up an inventory of these main research paradigms and methods. In a second part we will present a discursive and critical approach. The third part will focus on a mixed method of qualitative and quantitative analysis (the *Transformations* research project). The fourth part will highlight the challenges of a research and development project. Finally, a discussion will summarise these different approaches and show the added value for ESD/ESE research.

## 2. Several paradigms of research for ESD/ESE

According to researchers from New Zealand, Monroe, Adams and Grennway (2019), a same reality in the field of ESD/ESE can be explored using four paradigms.

The *postpositivist* approach consists of systematically observing the world, producing data to explain and predict. Unlike positivism, the postpositivist paradigm recognises that the values and beliefs of the researcher can affect what is observed and described.

The *constructivist* approach assumes that reality is individually constructed according to the cultural and historical contexts of the individual. This means that different people may have different perceptions and explanations for the same observation and the researcher will not attempt to resolve these variations with a single interpretation of reality. Collaborative research belongs to this paradigm in that the participants identify at the beginning of the process the questions that need to be asked. Such an approach must be based on trust, inclusion and the benefit to everyone.

The *critical* approach builds on the foundation of the constructivist approach. Most importantly, these researchers assume that individual constructions of reality are shaped by differences in social location, so that the focus is on transformative or emancipatory perspectives. Themes may include ethnicity, sexual orientation, disability or minorities. The role of the researcher is to work with participants to understand and explain social injustice, how it is manifested and how it can be challenged. In addition, critical research is linked to programmes advocating an alternative model of society.

The *pragmatist* approach suggests that the truth cannot be obtained by a single research method. Therefore, researchers should use quantitative or qualitative data collection tools to get as close as possible to the observed reality. The advantage of this type of approach is that it is free from the constraints of any of the above approaches.

Knowing that this typology was developed in the Anglo-Saxon context, we question the need to use it in the French (or even German) speaking context. Indeed, it allows us to characterize the research approaches and insists on the limits and opportunities of each approach.

Within the constructivist paradigm, some authors have developed a reflection on methods conducive to ESD/ESE. This is notably the case of Barth and Thomas (2012), who have reflected on the case study method. According to these researchers who conducted a meta-analysis, case study research can be summarized in many different ways and a variety of approaches. These approaches are particularly used to describe context-specific educational praxis and to draw conclusions by generalizing from the findings. The authors propose a fourfold typology based on the distinction of the data uses as input and produced as output. In this way, quantitative data can be distinguished from qualitative data either as the source or as the result of the synthesis process. This yields to the following approaches and methods: quantitative synthesis of either quantitative or qualitative data and qualitative synthesis, again based either on quantitative or qualitative data.

In Switzerland we have particularly developed *collaborative research*. Sanchez and Monod-Ansaldi (2014), for example, provided an overview of this research stream which try to take into account the complexity of teaching and learning situations. In the first part of the paper, they mention three categories of research: *feasibility research*, which aims to identify possibilities; *meanings research*, which focuses on the interpretation of learning situations and *regularity research* which try to compare several educational modalities. After that, they show the connection between several approaches such as ethnological approach, action-research, didactic engineering, design experiment and design-based research. According to them, design-based research is a synthesis of the previous currents which is characterized by new relationships between practitioners and researchers: indeed, practitioners involved in the research are not considered as 'subjects' to be studied by the researcher or as agents in charge of implementing experiments designed by researchers, but as co-participants in the whole research process, both for the design of the techno-pedagogical devices studied and for the analysis of the data collected.

Following on from this work, Roy, Gremaud, and Jenni (2019) have defined the *discursive community of interdisciplinary practices* which is a research-training design which aims to bring together the practical epistemologies of the different actors and to develop teaching practices in ESD/ESE with a view to instruction and emancipatory socialisation, in order to give students the tools to grasp the complexity of the world. This approach therefore emphasises three purposes: a pragmatic purpose, a critical purpose and a heuristic purpose.

In the light of these different theoretical frameworks we will now examine three perspectives that can benefit ESD/ESE research: a discourse-centred approach, a research that combines quantitative and qualitative methodology and a research and development project. The aim is not so much to be exhaustive, as there are many other methods that can be used in ESD research. Rather, it is to show the state of our thinking in Switzerland and the skills we currently have, with the aim of perhaps one day setting up a larger research programme.

### **3. The discourse and power asymmetries in education for sustainable development**

Education for Sustainable Development (ESD) is a complex and multifaceted field that goes beyond traditional environmental education. As numerous scholars including Gräsel (2018), Hofman (2015), and Bertschy et al. (2007), de Angelis 2022 noted, ESD encompasses questions of inequality, health, culture, spirituality, and many other aspects. Given the multifaceted nature and inherent complexity of ESD, there is a risk that it may be instrumentalized for purposes that are ultimately detrimental to the promotion of a sustainable future. Thus, it is essential to critically examine power relations and power asymmetries, which are often present in the

discourse of sustainable development. Therefore, teacher education requires an approach that critically questions, analyzes, and discusses concepts of and textbooks for ESD.

As educators, it is our responsibility to critically examine the material we teach and the concepts we adopt. This is especially important in the context of ESD, where biases and power asymmetries might have significant consequences for future generations. One approach to addressing these issues is to critically examine didactic materials as a starting point for reflective engagement with ESD in the classroom. This approach may serve as both a research tool and an integral part of teacher education, as proposed by the authors. It requires a critical analysis of the language used in ESD textbooks and concepts, as well as an awareness of possible underlying biases. In the first part of this section, theoretical reflections are made on the basis of such an approach.

The second part illustrates the approach by a discussion of a short section from a recent ESD teaching resource. The example highlights the importance of critically analyzing ESD textbooks. The approach proposed emphasizes the need for a double approach. Firstly, it is important to research possible biases in classroom material and didactic ESD concepts. Secondly, it is important to use this approach in teacher education to ensure that educators are aware of these issues and can address them in the classroom.

### **3.1. Theoretical anchoring**

Based on the often cited Brundtland definition of sustainable development (World Commission on Environment and Development 1987), it can be described as efforts made in the present to ensure that present and future generations can (still) live a 'good life'. However, our conceptions of 'a sustainable future' and a 'good life' are shaped by discourses that limit the possibilities of what can be thought about possible future(s). We must be open to multiple possible futures because the ones we imagine might not be the ones needed for future generations. Thus, it is important to recognize the underlying grammar of power that is interwoven with the discourse of sustainable development and its implicit idea of the future. Michel Foucault argues that discourses regulate what can and cannot be said or thought (Foucault 1980). Therefore, it is essential for educators to know the basis on which they build their ideas of sustainable development and what futures they envision.

In her article on ESD and postcolonial critique, Danielzik (2013) explains that focusing on the future often denies the past. Still, we are now in a situation that forces us to act (Thunberg 2019). However, the emphasis on urgency in sustainable development comes at a price. It means that there is no time to deal with the past, and this dovetails with a lack of acknowledgment that 'Western' domination and its technological and economic development were enabled through the oppression of the Global South. It is hence crucial to learn from the past because how we think about history and how it is told is one of the key factors in the perspective we take toward the 'other' (Chakrabarty 2000). Nonetheless, discourses on sustainable development often revolve around a colonial argument of the 'West' as the 'developed' part of the world bringing 'development' to others (Antunes de Oliveira 2020; Baud et al. 2019). As always, the 'reality' is much more complex, but it can be noted that underlying the language of 'development' is a grammar that perpetuates a colonial narrative. This can be understood as an effect of the discourse that still influences the way we think about 'development' and is part of the process that shapes our vision of possible futures. Ultimately, there is no one-size-fits-all solution for achieving a sustainable future, and it is crucial to consider whose futures we are envisioning and for whom those futures are intended.

In conclusion, sustainable development requires us to be aware of the discourses that shape our conceptions of the future, recognize the underlying grammar of power, and learn from the past. It is essential for educators to build their ideas of sustainable development on a solid

basis and envision multiple possible futures that are inclusive and sustainable for all individuals and communities. By doing so, we might create innovations that secure opportunities for future generations to be able to live 'a good life'.

### 3.2. Method

This section aims to show how the language used in textbooks can perpetuate power asymmetry and sustain colonial perspectives. A concrete example: The textbook *Aufbrechen Ankommen Bleiben*,<sup>3</sup> discusses migration and its reasons, making it an important contribution to education for sustainable development as migration will most likely increase through climate change (Kaczan and Orgill-Meyer 2020) and is among the main effects of the current economy based on constant growth (Hollifield 2004). Employing discourse analysis to critically analyze the language used in the textbook this section shows what is meant by underlying 'biases' and 'grammars'. A brief analysis of a short section of the book on the history of Syria is used to illustrate the point.

The analyzed section provides reasons for 'migration' and talks about 'events in Syria that lead to flight'. It begins with the year 1971 when Hafiz al-Assad took power, without any reference to Syria's rich history before that time. The entire paragraph is embedded in a narrative of crisis, where the Syrian population lacks political freedom, and protests are met with violence. The narrative is closely linked to the Assad regime, and the war in Syria is presented as the primary reason for people fleeing the country. The text deals with several topics, including the various ethnic groups, different religions, and the demographic composition of the Syrian population. However, the complex entanglements with the 'West' regarding Syria's fossil resources and the historical colonial structures are not addressed.

The analyzed section reduces Syria and the oppressive Assad regime to an image of totalitarian violent governments that cause people to migrate. The Assads' regime is presented as one-dimensional. Even when it is said that some people have benefited from the regime, this is immediately framed with a narrative of corruption, bribery, and violence. Such a narrative makes the people of Syria seem like passive victims to whom the unjust regime has inflicted violence, thus marginalizing their agency (Maagustín 2003). The portrayal in the textbook projects responsibility for the 'problems' entirely onto the 'others', in this case the Assad regime, while the people of Syria are portrayed as victims incapable of taking action and the colonial heritage of the 'West' is neglected. At the same time, 'Western democracy' is the place from which to judge the 'unjust regime'. The entire paragraph is embedded in a narrative of 'Western modernity' and moral superiority in contrast to an archaic 'non-Western regime of injustice'.

The textbook sets a normative standard that frames the main narrative of the book, where 'Western' democracy is the single moral framework against which everything else must be measured. Similarly, the analysis shows that discourse limits the possibilities for finding 'solutions'. They all lie within the 'Western' framework, and there is no room for alternative perspectives. The global South is excluded from those offering solutions. The analysis highlights how discursive structures sustain colonial perspectives. Therefore, it is crucial to be sensitive to language that perpetuates power asymmetry relationships and to critically analyze the textbooks used to teach about sustainable development. Engaging in and discussing such analyses as integral components of Education for Sustainable Development could offer valuable insights into envisioning alternative futures.

This paragraph reveals how language used in textbooks can perpetuate power asymmetry relationships and sustain colonial perspectives. This implies that there is a need to critically analyze the textbooks used to teach sustainable development. By critically analyzing the language used in textbooks, it is possible to identify how discursive structures sustain colonial perspectives, making it crucial to provide a balanced perspective that is inclusive of all viewpoints.

### **3.3. Limitations and challenges**

It is essential to acknowledge the limitations of this paragraph. The discourse analysis presented here is far too limited to provide a complete picture of the discourse and power asymmetries in ESD. The approach itself is highly complex and is linked to a demanding theoretical framework (Jäger 2005). Nonetheless, this analysis provides a direction in which an approach to address power asymmetries and biases in ESD could be headed. Discourse analysis is not a single clear-cut methodology but rather a set of different approaches, some of which have been criticized for not being 'objective' (Meyer 2005). Hence, a critical approach to ESD should be multi-methodological, as our article suggests.

### **3.4. Conclusion**

In conclusion, discourse and power asymmetries in ESD pose challenges and limitations to achieving a sustainable future. To address these challenges, there needs to be a critical examination of power relations and biases in ESD curricula and textbooks. It is also essential to recognize the underlying grammar of power in the discourse of sustainable development and to learn from the past to create inclusive and sustainable futures. Developing a comprehensive approach to address power asymmetries and biases in ESD requires an interdisciplinary approach that integrates various disciplines and perspectives. This should be accompanied by critical thinking skills and non-normative teaching approaches to promote learners' holistic understanding of sustainability issues. While discourse analysis can provide valuable insights, it is not a straightforward method and should be complemented by other approaches to develop a comprehensive approach to address power asymmetries and biases in ESD.

## **4. The transformations research project**

The *Transformations* research project<sup>4</sup> examines the issues around evaluation of competencies in Education for Sustainable Development (ESD). To address this complex issue as comprehensively as possible, a team of interdisciplinary (educational sciences and psychology), cross-border (Switzerland and France) and inter-institutional researchers implemented a mixed methodology (qualitative and quantitative), draw on the strengths of each of both methodologies. Following the example of Monroe, Adams, and Greenaway (2019) and their constructivist and pragmatic approach, we believe that it is important to recognize and consider the individual perceptions of each person, but also to be able to highlight the possible 'variables that affect some participants similarly' (Monroe, Adams, and Greenaway 2019). Thus, through this mixed methodology, we aim to identify what works in certain situations and to explore the potential transferability of these findings to other contexts. Indeed, in this complex reality, from which Sustainable Development (SD) issues arise, it is necessary to adopt multi-faceted approach to understand and address this complexity through various tools and methods. We will therefore present the interest of using such a methodology in ESD.

### **4.1. Theoretical anchorage of the project: a strong education for sustainable development**

As previously mentioned, the term 'Sustainable Development' is problematic because of its oxymoronic character (Sauvé 2007) and the variations in understanding of it depending on the context (social, economic, geographical, etc.). The *Transformations* project arises from the ambition to adopt a so-called 'strong' approach to SD (Theys and Guimont; Pellaud and Eastes 2020). This makes it possible to redefine SD and its objectives: it is thus not consensus, equilibrium

(as in the model of the three spheres (economic, social, environmental) or SD in itself but rather a means of questioning our practices and our relationship with the world, the environment, other people and ourselves. Indeed, the strong approach to SD thus places:

- the environment as the essential element of SD, since ‘the limits imposed by nature are absolute and not relative’ (Theys and Guimont 2018, p. 5),
- with society dependent on it, and finally,
- the economy at the heart of society and the environment.

Finally, with this representation of SD, the society is an interface between the environment and the economy, it is thus necessary to see a change of society which would take note of these ecological limits (Curnier 2017).

This societal transformation requires going beyond a simple adaptation to environmental and social changes, by questioning the transformation of our lifestyles to evaluate the pertinence of our attitudes and behaviours (Lange 2020). It is therefore important for school systems to maintain this logic and to propose activities that go beyond training in eco-gestures to move towards a real strong education in SD with the aim of getting pupils to be engaged, responsible citizens (Bourqui et al. 2012), in an ‘emancipatory and reflexive’ (Curnier 2017) combining ‘a critical attitude and proactive and societal creativity’ (Lange 2020).

Thus, competencies can be used as a lever for action (Mulnet 2019; Le Boterf 1998). We therefore hypothesise that working on and evaluating cross-cutting competencies in ESD (Gey et al. 2022) develops pupils’ sense of self-efficacy (Galand and Vanlede 2004) and a recognition of the capacity for action favouring responsible decision-making. Our study therefore examines the issues of development and evaluation of competencies in ESD in the capacity to educate responsible future citizens, the actors needed to preserve our environment and ensure the survival of our societies.

#### **4.2. Mixed methodology and research project Transformations: choice, protocol and tools**

Our research questions focus on the modalities and added value of assessing cross-cutting competencies in ESD and on the relationship between competencies and action in favour of SD. More specifically, we want to study the potential effects of certain practices in a school environment, with a particular emphasis on understanding how different actors, such as teachers and students, might be impacted. To achieve this, we plan to examine the attitudes, values, and professional habits of teachers, as well as the behaviours and perceptions of pupils. Additionally, we aim to track changes in pupils’ competencies over time to gain insight into how their mastery of various skills evolves.

As we have seen in the previous section, SD and ESD link a set of complex and interdependent phenomena. To observe this complex reality of how different actors engage and interpret with this subject matter (Monroe, Adams, and Greenaway 2019), we choose a mixed methodology provide a fine-tuned and comprehensive analysis. The combination of qualitative and quantitative methods should make it possible, *via* specific collection and analysis tools, to bring out common operational practices across different situations. To best address our research questions, we have developed various tools, including:

1. a self-reported questionnaire to assess students’ sense of competence, self-efficacy, self-confidence, and awareness of agency; Approximately 200 pupils from French-speaking Switzerland completed a questionnaire before, immediately after, and three months after the implementation of an ESD activity.



2. various 'ready-to-use' Transformations activities with self-assessment tools for pupils available at the end of each activity card.
3. an evaluation tool, concomitant to the self-assessments, designed for teachers to assess the level of mastery of certain cross-curricular ESD competencies (i.e. emotional, cognitive and metacognitive).

Quantitative methods will first examine the validity of different measures (self-reported questionnaires, hetero-assessment, co-assessment). In a second step, we will explore the relationships between competencies, perceived competencies, self-confidence and action. Finally, longitudinal analyses will inspect the evolution of these variables at three different times, as well as the potential interactions with different factors (e.g. grades of classes, pedagogical practices). In this context, it is interesting to test if mastery of competence is enough to initiate action, or if it is also necessary to be motivated to act as well as to feel able to do so (Mulnet 2019) (Figure 1).

To fine-tune the general quantitative results that we will obtain from statistical analyses, we will compare some of these measurements with the traces collected during the co-assessment moments. This qualitative approach will allow us to better understand how teachers implemented pedagogical sequences and used the assessment tool. Qualitative comparison will also refine explanations of the results established through quantification, specifically, through analyses of semi-directive interviews transcripts of 14 volunteer teachers involved in the project. During the interviews we asked them about their conceptions and teaching practices before and after their participation in the project.

In sum, the quantitative part of the project will allow us to describe relationships between studied phenomena, and the qualitative part will allow us to explain and give sense to these possible links. This combination is what makes this mixed methodology so interesting. Indeed, '[...] quantitative methods of investigation allow us to designate, quantify, distinguish and compare' (Amyotte and Pépin 2017, p.14) but 'they tell us nothing about what produces

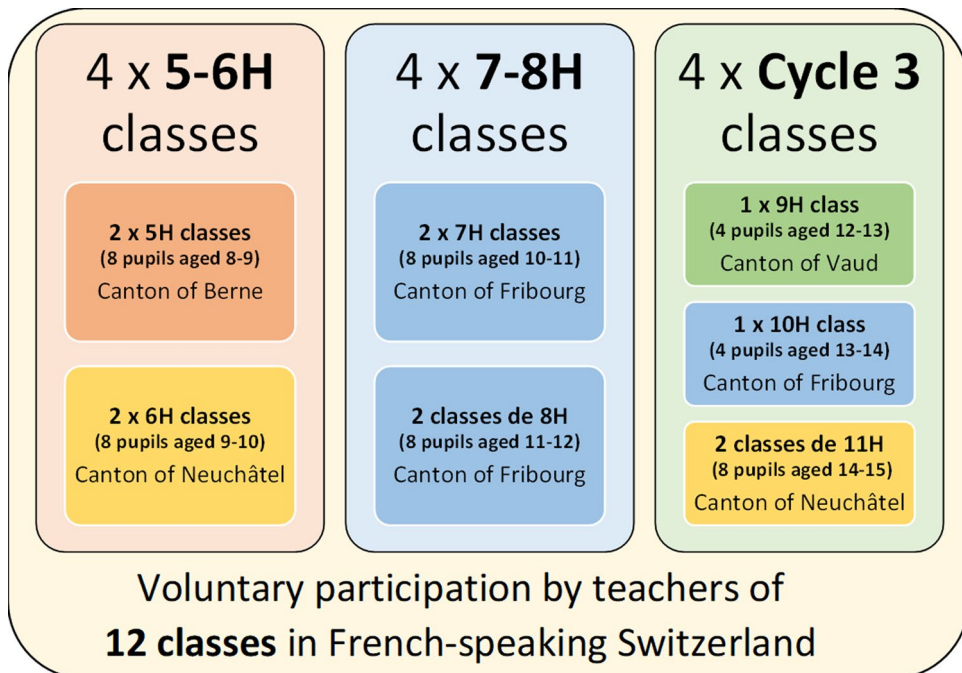


Figure 1. The research sample.

similarities or differences. Therefore, qualitative analysis is also needed to explain the whys of things, the interactions between phenomena and to make sense of the links established by quantification'. (Amyotte and Pépin 2017, p.14). Qualitative and quantitative approaches are therefore complementary and provide a comprehensive (both generally and in more specific way) view of a situation, which is of particular importance in complex situations of EDD.

#### **4.3. Discussion of the method and impact on education for sustainable development**

Several limitations could be considered to our mixed methodology proposed here. The first is the difficulty of generalising the results if the sample is not representative of the whole population concerned. In our case, teachers were recruited on a voluntary basis, and we can therefore assume that they are not representative of the general population. In other words, the 14 teachers of the present study found a certain interest in the project whereas other teachers could be more reluctant to carry out such a project. We will therefore have to test our protocol with other teachers with a more general recruitment system in the future. The second difficulty is to make concepts specifically operational for EDD (e.g. to create observable variables of competencies or reflection of a pupil's work). We will therefore have to check, for example, the validity of our questionnaire by making sure that we have not oversimplified certain complex phenomena and that the pupils understand the questions addressed to them. In addition, our study is primarily based on self-perception or subjective feelings (of teachers and pupils) which give necessary information but could lead to several biases such as social desirability and lack of awareness. In this prospect, future study could also use more objective measurements of changes in the level of mastery of certain competencies (e.g. tests based on performances to assess critical thinking and emotional intelligence) and video recording with inter-judge agreement (e.g. in the school to see climate action changes or responsible consumption). In addition, implicit tests (e.g. implicit association tests related to sustainability concerns, see e.g. Grazzini, Acuti, and Aiello 2021), physiological measures (e.g. skin conductance and heart rate variability to monitor stress regulation toward climate changes) and video records of interactions between teachers and pupils would allow a better understanding of the assessment's complexity and impact of EDD in the classroom.

### **5. The challenge of research and development**

In this section, we present the outline of a research and development project (Loiselle and Harvey 2007) which has the particularity of being bilingual, as it was carried out in the French-speaking part of Switzerland and in the German-speaking part of Switzerland. The project is entitled 'Je découvre des paysages/Ich entdecke Landschaften' (I discover landscapes) and aims to study the landscape from the perspective of education for strong sustainability. In particular, it consists of the production of a picture book for children aged 8 to 12 as well as a methodological guide for teachers and activity sheets. After examining the theoretical foundations of this project, we will present the methodology and then some results and questions related to this type of research.

#### **5.1. Theoretical foundations**

Education for sustainability contributes to the construction of a resilient society within the limits of the biosphere (Curnier 2017). It thus aims at a profound transformation of the educational system, so that everyone has the opportunity to acquire the knowledge, competencies and attitudes necessary to contribute to a sustainable society.

Consequently, the landscape, seen as the relationship that every socialised individual builds throughout his or her life with the territories in which he or she travels (Berque 1995), is a particularly interesting object for thinking about sustainability issues. Indeed, it is a source of information, a support for appropriation and a trigger for questioning (Sgard and Paradis 2019). Deeply political, it also favours sensitive approaches that give space to our feelings, emotions and values.

In the Swiss study plans (*Plan d'études romand, Lehrplan21*), the term landscape has been deliberately evacuated in order to avoid purely descriptive approaches. It should therefore be put back on the agenda in an interdisciplinary perspective. Indeed, it refers to a subjective pole - that of the individual -, a symbolic pole - that of culture -, an inter-subjective pole - that of society - and a physical pole - that of nature (Backhaus et al. 2007). It is also a question of encouraging systemic analysis, so that, in particular, students do not consider the landscape as an object disconnected from their own spatial practices (Huser 2021). On the basis of this theoretical insight, we were able to identify the following three research questions:

- How to teach landscape in an emancipatory perspective?
- What mediating tools should be offered to students to develop competencies?
- How to accompany the teaching staff in order to propose a quality teaching on landscapes?

## 5.2. The methodology

Research and development is inspired by an interpretative and ethnographic current. It consists of developing material objects (teaching materials, guides) and prescriptions guiding action (procedures, strategies, methods, models) (Loiselle and Harvey 2007). Thus, the researcher is involved in both development activities and the analysis of these activities.

In the present case, the team includes not only researchers (HEP Zürich, University of Zürich, HEP Vaud, University of Lausanne), but also partner teachers, speech therapists, members of the national agency Education21, illustrators and a publisher. The first step was to identify the relevant elements to be taught about the landscape. In a second step, we tried to identify the representations of pupils aged 8 to 12. In the third step we developed the picture book, the teaching guide and the activity sheets. In the fourth stage, we tested the material produced with different audiences. Finally, the fifth stage consisted of finalising the documents produced. We concluded this work with a vernissage of the book and teaching materials (Table 1).

## 5.3 Results and issues

The theoretical study of learning issues led us to focus on understanding the qualities of a landscape and the idea that we are all responsible for the landscapes we shape.

Table 1. The steps of the project.

Step	Activity	Schedule
1	Review of literature on landscape and learning.	January to September 21
2	Study of the representations of pupils aged 8 to 12 on the landscape	October 21 to January 22
3	Development of the picture book, teaching guide and activity sheets.	January to June 22
4	Testing of the material with different audiences: in the classrooms – 3 in French-speaking Switzerland, 5 in German-speaking Switzerland – speech therapists, scientific experts, didactic experts.	June to October 22
5	Finalising the documents.	November to December 22
6	Opening of the book and teaching materials	March 23

The book is thus presented in nine double-page spreads that address the following issues: What do landscapes give us? How do we perceive landscape? Are there 'good' landscapes? Why are there conflicts over landscapes? How do humans change landscapes? Why do some landscapes need protection? How can we help shape landscapes? How does our consumption shape landscapes here and elsewhere? What landscapes will we need in the future? In addition, each double-page spread includes a short block of text containing two questions that allow people to ask themselves about the landscape and make connections with their experiences. A 'search and find' section also allows them to refine their observation and to ask themselves questions about the particularities of the landscape. Finally, a glossary defines the terms that are particularly important for understanding the issues of the double-page spread (Figure 2).

For the didactic guide and activity sheets, we focused on experiential learning in the surrounding space and on the creation of class maps highlighting the specificities of the landscape near the school.

This work raised several questions. The first is about collaboration issues, the second about the role of the teacher and the third about training.

With regard to the issues of collaboration, we have to admit that it was not easy. Indeed, people from different linguistic regions and different professional backgrounds had to find a consensus on the research approach to be implemented and on the choices to be made throughout the project. In particular, the different conceptions of geography were an obstacle in the first phase of the project, as this discipline refers to the natural sciences in the German-speaking world, whereas it refers to the humanities and social sciences in the French-speaking world.

As far as the role of the teacher is concerned, we found that it implies a committed impartiality (Simonneaux 2006). Such a posture allows the teacher to give his or her opinion while encouraging the analysis of competing points of view on controversies. It also allows students to develop competencies of civic engagement and courage.

Finally, such a picture book requires solid training for the teaching staff, whether it be on the qualities of the landscape, on the investigative approach, on the posture to adopt or on the management of class interactions. Indeed, the teachers who were partners in the research highlighted difficulties in going beyond a simple and linear reading of the picture

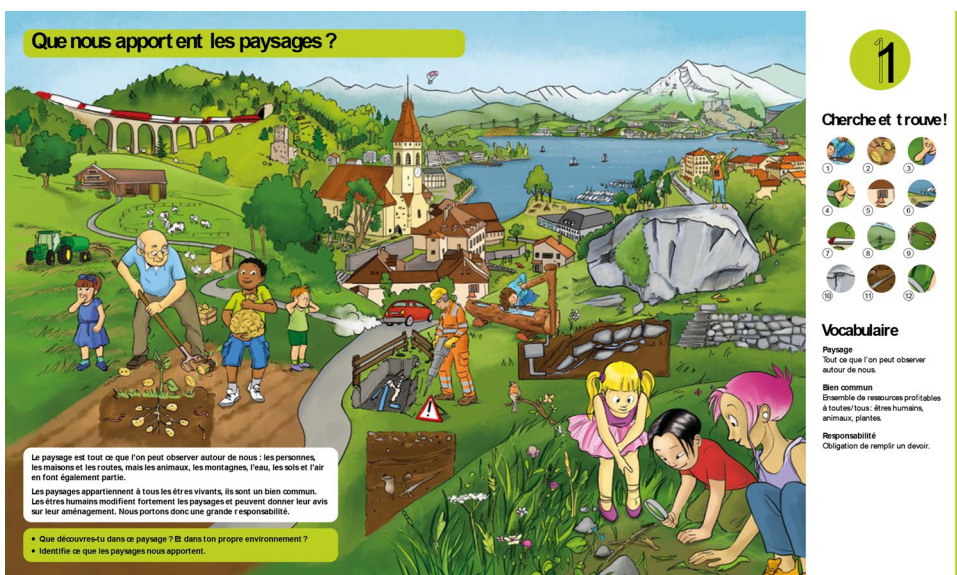


Figure 2. An example of a picture book page.

book and therefore in building learning that goes beyond the simple acquisition of a specific vocabulary.

## 6. Discussion and conclusion

Having reviewed these three ways of approaching research in our country, we think it is appropriate to take a step back. Indeed, Teacher education institutions in Switzerland have become tertiary (thus academical) institutions only lately. Their research, moreover in a rather recent field as ESD, is therefore not anchored in well-established traditions. It is also still rooted in a local context, broader collaborations at national and international level still remaining rather scarce. Moreover, the country's research landscape is shaped by a linguistic variety implying different schools of thoughts, different ways of understanding a same concept, and multiple interpretations of what research in the field of ESD can mean. This leaves space to a diversity of approaches, bringing to light various facets of a research that can contribute to ESD. At the same time, as the field is rapidly expanding in a country with still rather limited research capacity at the level of teacher education, it seems of interest to focus on cooperation rather than on concurrence, and to coordinate work being done, so as to benefit from complementarities and fruitful cross-inspiration.

With this in mind, this contribution has gathered three examples of ongoing Swiss reflection in the field of ESD, each adopting another approach. The first example presented mobilizes the framing used in postcolonial studies to look at ESD teaching material under a critical perspective. It can be related to the *critical* approach described by Monroe & al (2019), combined with the idea of *case studies* (Barth and Thomas 2012), as a specific pedagogical resource is looked at more specifically. It echoes work done since several years in studies crossing post-colonial studies with ESD (see f.e.g. Danielzik 2013; Danielzik & al, 2013; Education2121, 2017). In this case, a perspective elaborated in another field (post-colonial studies) is used to question underlying assumptions of a certain type of ESD. The focus is set on the framing.

The second example, based on the *Transformation* project, could be related to the *pragmatic* approach, adopting a mixed method approach combining quantitative features (questionnaires) and qualitative components (interviews, interaction analysis of co-evaluation) in order to tackle how to evaluate ESD competencies. It echoes work done on the difficult question of assessment of competencies, not less difficult within the field of ESD (see f.e.g. Farioli & al, 2022). Here, research settings that are not specific to ESD are used within the field, using well know methods to approach complex issues. The focus is set on the tools.

The third approach mentioned, developmental research, clearly refers to the collaborative approaches used to understand the complexity of teaching and learning situations (Sanchez and Monod-Ansaldi 2014). It can be used for all three types mentioned by the authors (feasibility, meaning or regularity research), but the example given could be affiliated to the meaning components. Developmental research can be based on what Roy & al. (2019) call a discursive community of interdisciplinary practice combining the practical epistemologies of the stakeholders involved. The focus is on the approach.

This trilogy of ongoing research approaches shows that ESD can be addressed in different ways. It also seems to add value to research that focuses exclusively on educational policies or on new curricula to be prescribed. Framing is essential to challenge the underlying paradigms in our societies and in ESD discourse, in order to avoid reproducing unsustainable ways of understanding the world. Mixed methods are a necessity to address the complexity that characterises the implementation of ESD in school realities. And the participatory and iterative components inherent in developmental research are particularly consistent with the essence of ESD in three ways: they bridge the gap between researchers and those involved, thus recognising the latter as stakeholders and avoiding the perpetuation of power relations in the research setting; they allow for collective group evolution, thus forming reflective practitioners evolving

with, through and for the research; and they foster an articulation between academic and practical epistemologies, thus encouraging richer ‘knowledge ecosystems’ (De Sousa Santos et al. 2007).

None of these approaches can be considered specific to ESD. They are not specific to Switzerland either, as they have also been developed in the European context. However, they show different ways of conceiving ESD research.

Thus questioning underlying paradigms by using another framing to look at ESD, tackling the complexity of implementing ESD through mixed methods, and working with collaborative approaches that empower teachers and learners as an ESD community seem to fit the needs within the field. Ways of using the complementarity between these approaches would be interesting to discuss, as they are not mutually exclusive. That would imply to enter into a collaborative rather than concurrency mode, which seems meaningful considering the task ahead. The examples elaborated in this contribution might therefore nurture the reflection around the type(s) of research needed for ESD and their possible articulations; and they echo what has been presented in the theoretical framework. They also open the door to a national research program that it would be advisable to launch in Switzerland given the various social, environmental or democratic emergencies that characterize the current period.

## Notes

1. The Chamber of HEP is a structure bringing together the rectors of the Swiss HEP, that means the Swiss Universities of Teacher Education.
2. This text is also a follow-up to a symposium held on September 7<sup>th</sup> 2021 as part of the European Conference on Educational Research (ECER).
3. The information presented in this paragraph is based on page 31 of Hefel’s book (2017), originally published in German. The author has provided all translations. It’s worth noting that page 31 discusses the “history of Syria” for the use of teachers working with *Aufbrechen Ankommen Bleiben*.
4. <https://blog.hepfr.ch/transformations/thematiques/>

## Disclosure statement

No potential conflict of interest was reported by the authors.

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