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ESD in school: Understanding French-speaking Swiss pupils' representations of sustainability

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ABSTRACT

In the context of the Anthropocene, Education for Sustainable Development (ESD) is crucial to educate the next generation. However, it has long been neglected in curricula. In this study, we were interested in knowing pupils' representations of sustainability. In this regards, 219 French-speaking Swiss pupils in compulsory school filled out an online survey. The preliminary results distinguished three groups of pupils characterised by their knowledge, attitudes and visions of the future in a sustainability perspective. Moreover, our results reveal that pupils from poorer backgrounds and in a vocational training school path were more passive towards sustainability. Finally, they understand and are practising eco-gestures, but do not understand what sustainability is. These findings legitimise the need to implement an ESD in classrooms with the aim of empowers learners with knowledge, "*savoir-être*" and "*savoir-faire*" to act for societal and environmental transformation.

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The Anthropocene represents the current geological epoch marked by the human disruption of ecological and climatic balances (Crutzen 2002). Physical dimensions define this epoch, but also societal dimensions marked by the domination of humans over the planet, exacerbated by the development model of Modernity. To transform the latter, society should positively build a culture of sustainability (Palsson et al. 2013). In the context of the Anthropocene, schools play an important role in fostering societal creativity. However, transformative social change implies a refounding of educational policies (Curnier 2021; Sterling 2011). Education for Sustainable Development (ESD), whose aims are in line with this, have gradually appeared in curricula since the 2000s and is promoted by UNESCO. ESD empowers learners with knowledge, "*savoir-être*" and "*savoir-faire*" to act for societal and environmental transformation (UNESCO 2020). Nevertheless, it has to face various challenges related to the school form, taught subjects or trained competences. The transformative and emancipatory visions are confronted with a productivist prescription of educational goals currently implemented in schools. For example, in the curriculum of the French-speaking part of Switzerland, ESD appears in a transversal way and in a weak sustainability perspective (Curnier 2021). Therefore, using the terminology of Vare and Scott (2007) ESD 1 which includes the promotion of socially accepted behaviours and ways of thinking is more present in French-speaking part of Switzerland curricula and classrooms (Pache, Breithaupt, and Cacheiro 2018). To promote an education that unfolds a transformative and strong sustainability perspective based on planetary boundaries (Steffen et al. 2015) and doughnut economics (Raworth 2017), the Canton of Vaud has chosen to disengage from this consensual ESD 1 in 2021. Department of Education and Vocational Training now promote ESD 2: citizen

empowerment by building capacity to think and act critically about sustainability (DEF 2022; Vare and Scott 2007). In this paper, we employed the second approach of ESD.

Despite the institutional orientation in the French-speaking part of Switzerland, teaching ESD is not mandatory so it is not systematic (Kyburz-Graber, Nagel, and Gingins 2013). Therefore teachers could benefit from means to implement such education. This is the subject of a research project that aims to develop collaboratively a teaching arrangement. It will mix several educational approaches: ESD, geography didactics and creativity in an integrated way. Geography offers a disciplinary entry for secondary pupils. Studying the subject of rivers planning provided in the geography curriculum will lead pupils to understand a socio-ecological system and envisioning change. Before creating a teaching arrangement in an ESD perspective, it is appropriate to collect social representations of pupils. Indeed, from social representations, it is possible to know individuals' prior understanding, on which to build knowledge (Barthes and Alpe 2016).

In this context, the aim of this paper is to present the French-speaking Swiss pupils' representations of sustainability in 2021. Moreover, we are interested in assessing whether different groups of pupils may be distinguished based on their representations. We then want to test whether these different groups differ, notably regarding their relationship and their attitude toward nature as well as their creative way to deal with river planning.

Social representations of sustainability

Social representation, a field developed by the psychosociologist Moscovici (1961), is defined as *"a process of internalisation of an object by a person or a group to become an object of thought whose content is substituted for reality"* (Barthes and Alpe 2016, p. 57). The system of representations specific to each individuals composed in particular of knowledge, intentions, beliefs, values and emotions will determine attitudes that predispose to action (Milfont 2012).

Within the value system related to the environment, the dominant thinking has historically come from Western societies that see nature as a resource for human beings. The ideological current that characterises this relationship to the environment is called anthropocentrism. It recognises the value of nature only when it is useful to human beings. In opposition to anthropocentrism, ecocentrism recognises the effects of nature in human experience and its functions in the qualities of human life. Two subgroups compose ecocentrism: "painism", which is sensitive to the well-being of all sentient creatures, and biocentrism, which takes into account all living entity. A consensus on a conception of the relationship between humans and nature has not yet emerged, but it is possible if there is a change in the order of value priorities (Hess 2018). Cultural repertoires or existing social practices shape representation and engagement towards environmental issues in daily practice. In a study conducted in Western Switzerland by Balsiger, Lorenzini, and Sahakian (2019), most participants relate to the adaptative repertoire, reformist and affiliated to the Modernity paradigm. Few participants associate with the transformative repertoire which criticises our capitalist society and insists on a systemic change.

Over the years, pupils have shown a growing interest in climate issues, including participation in 2019 Strikes for the Future. Negative emotions such as stress and the fear for the collapse of our civilisation are generated in the context of the environmental crisis (Hickman et al. 2021). These negative emotions result in a denial that perpetuates the destruction of the environment and leads to a vicious circle (Curnier 2021; Macy and Brown 2021). To respond to the sustainability challenges facing our society, tomorrow's citizens need to acquire various competences such as creativity in order to think differently and imagine possible futures (Craft 2005; Pache 2017; Raskin 2008; UNESCO 2017; Vincent-Lancrin et al. 2020). Creative thinking can enable students to invent models of transformative development (Curnier 2017). This competence therefore remains consistent with a transformative education advocated by UNESCO (Pache et al. 2016).

In secondary school, the Canton de Vaud where the study has been conducted has a segmented system. Pupils are separated in two school paths depending on their academic achievement: path to university (PU) or path to vocational training (PVT). Moreover, this educational separation has shown the effects of strengthening educational inequalities and to be indirectly founded on socio-economic characteristics. Therefore, the educational offer tends to be different depending on the social background of the pupils (Felouzis and Charmillot 2017). This element can have effects on the social representations of ESD, whose reference knowledge is hybrid (disciplinary, experience and vernacular (endogenous, local, every day, ordinary) knowledge) (Bédouret et al. 2018).

To collect the secondary pupils' representations of sustainability, Freudiger, Fink, and Iseli (2011) conducted a study in the French-speaking part of Switzerland. The authors noted that the majority of pupils were not aware of the concept of sustainable development defined by the Brundtland report in 1987 (CMED 1987). Pupils nevertheless declared that they were acting in favour of environmental actions such as waste sorting. The determining factors in distinguishing attitudes related to sustainability were the ability to consider solutions to combat disasters and their level of knowledge about sustainable development and climate change. In this regard, the typology of French-speaking Swiss pupils' attitudes was characterised by four different postures: *ecologist* who is willing to change one's own behaviour, *consumerist* who isn't willing to change one's practices, *confidant* who believes in technical solutions and *fatalist* who expresses a feeling of powerlessness in relation to climate disasters (Freudiger, Fink, and Iseli 2011, p. 106). Some of the questions from this 2011 study were included in our questionnaire to compare their findings with our own in terms of pupils' representations and attitudes regarding sustainability.

Materials and methods

The researchers created an online, cross-sectional survey (Jones, Burnay, and Servais 2000) to collect data on pupils' representations of sustainability and river planning. Participants were notably asked to report their pre-existing knowledge (Question 2.1, such as "you may have heard of 'sustainability', define this notion in your own words"); their attitudes (Q2.7 such as "do you personally make gestures or take actions that you think are favourable to sustainability (environment, society)? If so, give one or more examples of gestures or actions you carry out. If not, explain why"). The modalities of response were writing a long text. Regarding their vision of the future in a sustainability perspective, the items were adapted from Freudiger, Fink, and Iseli (2011; Q2.8, such as "I will make a good living; the climate and economic crises will affect my life; I will participate in political actions; a rich nature and a pleasant climate will allow me to live comfortably"). We also measure their relationship to nature through items related to their conception of nature and their daily practice (Q2.14, such as "in your opinion, flora, fauna and ecosystems should be protected in the same way as humans. They are equal"; Q2.15, answer the following statements: nature is a resource for me/is good for me" or "my hobbies are in nature"). For Q2.8, Q2.14 and Q2.15, pupils had to answer on a 4-point Likert scale, ranging from 1 (I don't agree at all) to 4 (I totally agree). In addition to their representation, we asked pupils to report the source of their knowledge on the aforementioned concepts (Q2.16 "What formed your own relationship to nature" Choose the appropriate items. "Experiences at school; in the family environment; related to personal involvement; knowledge from social networks"). Regarding river planning, we ask pupils to create a better river planning from an urban canalised river's photography (Figure 1 above). The modalities of response were writing a long text.

The sample consists of 219 secondary school pupils (mean age = 13year-old, sd = 0.975) from six geographically distinct schools (urban $N=114$; suburban $N=64$; rural $N=41$). The classes were selected on the basis of a convenience sample with prior agreement of teachers to participate in



Figure 1. Veveyse river, Vevey, Canton of Vaud, Switzerland (ASG, 2022).

this research¹. Most of our sample was in their 9th year of school ($N=167$, 76%), while the rest of the sample was either in their 10th year ($N=35$, 16%) or 11th year ($N=17$, 7.8%). Our sample was equally distributed between two school paths (PU $N=112$ and PVT $N=107$, respectively).

Data analyses

Qualitative data is analysed based on conceptual categories that provide a level of abstraction which can be compared with the conceptual framework (Paillé & Mucchielli, 2012). Qualitative data had been coded to allow quantitative analysis. More precisely, question 2.1 referring to knowledge of sustainability was coded into 1=conception unsatisfactory; 2=conception inadequate; 3=conception satisfactory; 4=good conception (Beitone et al. 2013). Question 2.7 on gestures towards sustainability was coded into 1= no gesture, I see no interest; 2=no gesture, I see no sense; 3=yes, eco-friendly gesture; 4=yes, sustainable behaviour. Question 3.6 referring to the river planning case study was coded into a creativity typology 1= no competence; 2=untapped competence; 3=emerging competence; 4=excellent competence (Vincent-Lancrin et al. 2020). We choose not illustrate those analysis because it is not the purpose of this paper.

Descriptive analyses (e.g. level of knowledge regarding sustainability) and latent profile analyses were performed on R using the Mclust package (Scrucca et al. 2016). In this study, we were interested in assessing whether different types of pupils could be distinguished based on knowledge and attitudes towards sustainability and their visions of the future. Six items were selected: Q2.1 *Sustainability knowledge*; Q2.7 *Sustainability gestures*; Q2.8 *Future income*; Q2.8 *Future crisis*; Q2.8 *Politic actions*; Q2.8 *Rich nature and comfortable climate*. All items were classified on a scale ranging from 1 to 4 to be analysed. The purpose of latent profile analyses is to extract groups of individuals (i.e. latent classes), which are homogeneous on the attitude and representation variables. Latent class models categorise the estimated proportion of individuals in different classes, which represent class sizes (Hickendorff et al. 2018). The outcome of such analyses does not include each participant's class membership: it instead estimates the probability that such event belongs to the latent classes defined (Mutz and Daniel 2013).

Models were selected based on statistical measures of fit and interpretability. More specifically, we compared models based on the Bayesian Information Criterion (BIC) (Schwarz 1978), where the lowest value indicates the best model fit. As we did not have a dichotomous indicator, we could not use the bootstrap likelihood ratio test to select the best model (Patrick et al. 2017). We further considered the Akaike information criterion (AIC) (Akaike 1974). Here as well, the lowest value refers to the best model. We finally compared models based on their relative entropy. As explained by Allison et al. (2016), entropy represents the classification quality of each model, and the relative values of entropy may range between 0 and 1, where the highest values indicate the clearest distinction between the classes.

After selecting the model having the best fit, we extracted the class membership for each individual. We then were interested in comparing the classes (groups) regarding their relationship and attitudes towards nature (Q2.14 and Q2.15). As the groups were not balanced, we performed nonparametric ANOVA followed by Dwass-Steel-Crichlow-Fligner comparisons; the robust ANOVA allowed us to compare the groups to precisely know which classes (groups) were different from one another. Finally, we were interested in how the classes would differ regarding the creative response to the river planning's case study (Q3.6). As this question was coded into four categories, we performed a chi-squared test of association between question 3.6 and the classes.

Results

Pupils' attitudes towards sustainability

In this section, we first communicate descriptive results regarding pupils' attitudes towards sustainability. Generally, participants report poor knowledge of sustainability (1 conception unsatisfactory $N=74$, 34%; 2 conception inadequate $N=114$, 52%; 3 conception satisfactory $N=25$, 11%; 4 good conception $N=6$, 3%). Pupils make mostly eco-friendly gestures towards sustainability (1 No gesture, no interest $N=59$, 27%; 2 No gesture, no sense $N=8$, 4%; 3 yes, eco-friendly gesture $N=120$, 55%; 4 yes, sustainable behaviour $N=32$, 15%). According to the pupils, the origins of their knowledge related to sustainability are diverse: school 34%; family 25%; social network 20%; personal interest 9%. Concerning the nature, the origin of the relationship with nature comes mostly from the family environment 42% (school 20%; personal interest 13%; social network 11%; other 14%).

Significant correlations, shown in Table 1 below, exist between knowledge and gestures towards sustainability. Therefore, the more pupils know about sustainability, the more they will have a positive attitude towards sustainability. Moreover, the gestures are significantly correlated with the place of residence. In other words, the more pupils live in an urban area, the more they will have positive gestures or behaviour towards sustainability. This positive attitude towards sustainability is correlated with the two school paths PU and PVT and with a positive relationship to nature. Nevertheless, a bias exists in the sample because pupils from Lausanne City (urban area) are only in PU classes and the pupils in rural areas are in PVT classes.

Groups of pupils according to their attitudes towards sustainability

We then were interested in assessing whether different latent classes could be distinguished in our sample. Results from the latent class analyses are described in Table 2 below. This table reveals that the BIC, the AIC and the entropy suggest that three latent class model should be kept. In this model, the first class consisted in 39 participants, the second class in 66 and the last class in 144 participants.

Figure 2 below represents the three classes identified by this model. Based on this graphical representation, we propose that three types of attitudes may exist. We called the first type (class 1) *the cognisant*, as it is characterised by relatively high scores on sustainability knowledge

Table 1. Correlations between six relevant items.

	Q1.4 school path	Q1.5 place of residence	Q2.1 sustainability knowledge	Q2.7 sustainability gestures	Q2.14 biocentric posture	Q2.15 well-being in nature
Q1.4 school path	1	-,608**	-,249**	-,415**	-,278**	-,300**
Q1.5 place of residence		1	,059	,219**	,189**	,202**
Q2.1 sustainability knowledge			1	,254**	,079	,129
Q2.7 sustainability gestures				1	,302**	,269**
Q2.14_biocentric posture					1	,354**
Q2.5 well-being in nature						1

**The correlation is significant at the 0.01 level (two-tailed).

Table 2. Fit information for LCAs modelling with 1-3 latent classes.

Classes	AIC	BIC	Entropy
1	3810.23	3857.67	1
2	3626.43	3700.99	0.97
3	3461.67	3563.34	0.99

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; LL = log-likelihood. The lowest BIC and AIC are in bold.

or gestures, a future belief in a good income, in the likelihood of future crisis, their participation in political actions and a rich nature and comfortable climate is unlikely in the future. The second type (class 2), *the passive*, is characterised by lower scores on sustainability knowledge and gesture and politic actions, but with higher scores on income and rich nature and comfortable climate. Finally, the last class (class 3) may be called *the confident*, as participants in this class score relatively high on all dimensions. They are confident in the future: crises will not affect their lives and a rich nature and a pleasant climate will allow them to live comfortably. To name our groups, we have drawn on the research typology of attitudes towards sustainability from Freudiger, Fink, and Iseli (2011).

Results of the non-parametric ANOVA suggest that the three classes differ significantly regarding the biocentric variable (Q2.14) ($\text{Chi}^2(2) = 17.579, p < .001$). More specifically, post-hoc comparisons reveal that classes 1 and 2 significantly differ on the biocentric variable ($W = -4.91, p < .002$) as well as Class 2 and Class 3 ($5.04, p < .001$). Regarding attitudes towards nature (Q2.15), results from the non-parametric ANOVA show a significant difference between the groups ($\text{Chi}^2(2) = 20.4, p < .001$). These results reveal that class 1 scores significantly higher than class 2 ($W = 3.73, p < .001$) and class 2 scores significantly lower than class 3 ($W = 6.33, p < .001$). In Table 3 below, we interpreted those ANOVA results as a positive and active relationship to nature for classes 1 and 3. A less positive and less active relationship to nature for Class 2. Regarding to creativity, association between the classes and question 3.6 is significant ($\text{Chi}^2(6) = 16.0, p = .014$). In order to categorise in more detail these classes, we looked at them across contingency tables in relation to the following items: place of residence, school paths and creative response to the case study.

In summary, class 1, *the cognisant*, are in majority urban and in PU with a positive and active relationship to nature. The use of creativity in the case study is good for 28% of the group 1 members, which is higher than the other classes. Class 2, *the passive*, a group of diverse origins in majority in PVT, a less positive and active relationship to nature and low use of creativity. This group distinguish itself from the other groups. Class 3, *the confident*, is mainly urban, in PU, have a positive and active relationship to nature and a good creativity for 26% of the group's members. Those results show that groups 1 and 3 are similar. Their belief in the future is what differentiates them. The group 1, *the cognisant* thinks it is unlikely that a rich nature and a pleasant climate will allow them to live comfortably.

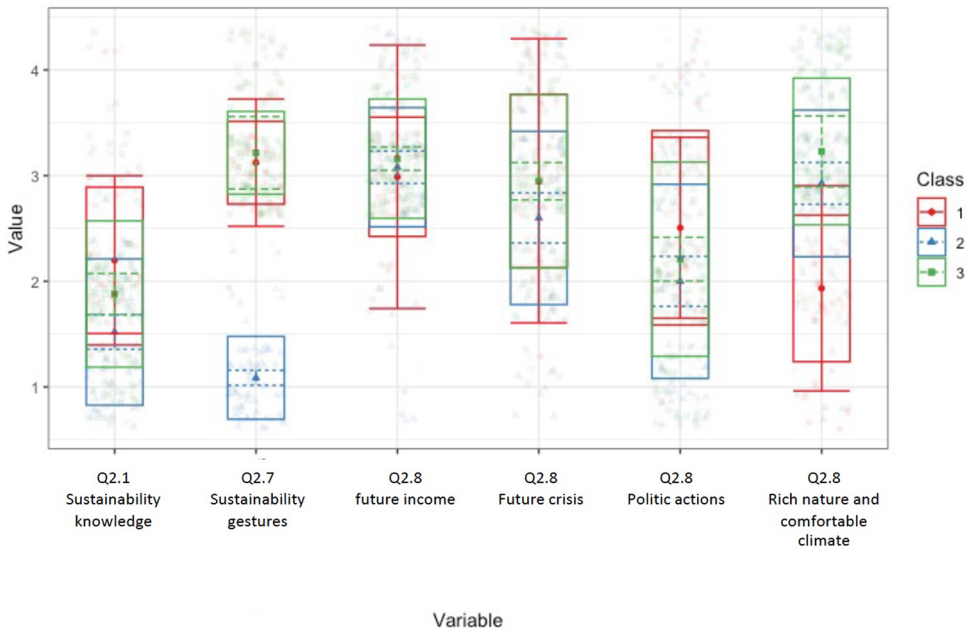


Figure 2. LCA graphic.

Table 3. Summary of the class’s characterisation.

Items/Names	Class 1: the cognisant N= 39, 18%	Class 2: the passive N=66, 30%	Class 3: the confident N= 114, 52%
Place of residence	Urban N=23, 59% Suburban N=11, 28% Rural N=5, 13%	Urban N=26, 40% Suburban N=21, 32% Rural N=19, 30%	Urban N=65, 57% Suburban N=35, 31% Rural N=17, 15%
School paths	PU N=25, 64% PVT N=14, 36%	PU N=14, 21% PVT N=52, 79 %	PU N=73, 64% PVT N=41, 36%
Relationship to nature creative response to the case study	Positive and active Good Creativity N=11, 28%	Less positive and less active Good Creativity N=9, 16%	Positive and active Good Creativity N=30, 26%

Discussion

In the context of the Anthropocene, the younger generation needs new competences to adapt to an uncertain world and to imagine a new societal model (UNESCO 2020; Vare, Lausset, and Rieckmann 2022). In this regard, ESD offers relevant aims, specific competences and useful learning. Nevertheless, to implement such an education, French-speaking Swiss teachers still need, among other things, pragmatic tools such as teaching arrangement. Based on our results, we first like to discuss the possible link between education aims and pupils’ representations of sustainability. These include elements that stand out, such as the pessimistic vision of the future and the passivity of some of the pupils. Secondly, we describe didactic implications of our results concerning eco-gestures and pupils’ relationship to the nature.

Based on pupils’ representations and attitudes towards sustainability, why is a change in educational aims important?

This research provides interesting results by distinguishing groups of pupils based on their representations and attitudes related to sustainability: the groups 1 and 3 have positive attitudes, but group 1 shows a more pessimist vision of the future. In contrast, group 2 is characterised

by a passive attitude related to sustainability. Those findings are consistent with the research conducted in 2011 (Freudiger, Fink, and Iseli 2011). However, with schools strikes for climate in 2018 and increased media coverage of climate issues, there has been a slight evolution in representations and attitudes towards sustainability. The pessimist vision of the future from the group 1 reflects a general trend among young people. The inadequate response to climate crisis is associated with distress and anxiety (Hickman et al. 2021).

Another striking result generated by the survey is the differing attitudes towards sustainability of the *passive* group which includes 30% ($N=66$) of the sample. They belong mostly to VT path and are indifferent to sustainability. The source of knowledge comes more from the school in terms of sustainability and more from the family in terms of the relationship with nature. Educational separation tends to strengthen inequalities and is indirectly founded on socio-economic characteristics. Therefore, the educational offer tends to be different depending on the social background of the pupils (Felouzis and Charmillot 2017). These results show a certain inequality in the acquisition of knowledge and attitudes in favour of sustainability.

We have noticed that the majority of pupils makes eco-gestures without understanding what sustainability is. As a result, they reproduce the dominant social practices affiliated to the Modernity paradigm experienced at home and at school (Balsiger, Lorenzini, and Sahakian 2019). However, since sustainable development was imposed in public policies, many scientists regret not seeing real results on environmental and social issues. The future of humanity can only be sustainable by taking into account the basic needs of everyone and by respecting the planetary limits (Norton 2010; Raskin 2008; Raworth 2017; Rockström et al. 2009). Schools have an important role to play in fostering societal creativity in order to develop sustainable solutions. A transformative social change advocated by the strong sustainability paradigm implies rethinking educational policies towards citizenship aims (Curnier 2021; Sterling 2011). Going further, Lotz-Sisitka et al. (2015) argue that transgressive forms of pedagogy must be considered in education. This requires rejecting the school form and the “ethical and epistemological imperialism” present in society and education in order to impart learning capacities oriented towards engagement and experiences in transformative practices. In French-speaking part of Switzerland, inequalities in attitudes to sustainability and the reproduction of existing social practice should justify emancipatory and transformative educational aims. Skills (*savoir-faire*), attitudes (*savoir-être*), values and emotions are at the heart of ESD with the aim of training responsible citizens able to act for a more sustainable world (Curnier 2021; UNESCO 2020). A challenge for the implementation of such education lies in the practical consideration of hybrid knowledge (Bédouret et al. 2018) and the recognition of negative emotions that can arise from acquiring sustainability knowledge. The next paragraph will attempt to provide some practical thinking to address this issue.

What pupils’ representations of sustainability tell us: A didactic reflection

Eco-gestures are understood and applied in practice for 55% ($N=120$) of our sample. In order to go beyond standardised teaching based on eco-gestures or ESD 1 (Vare and Scott 2007), Roy and Gremaud (2017) suggest working in class on ESD problems in a perspective of *instruction* through scientific method and *emancipating socialisation* centered on ethical debate. Therefore, the authors have designed an interdisciplinary investigative approach in four phases: problematise, plan, investigate and conceptualise. This approach promotes complex thinking and pupils’ engagement through construction and reflection on references (Roy and Gremaud 2017). The authors have worked in the French-speaking part of Switzerland context thus their study seems relevant for our research.

Our results demonstrate a positive and active relationship to nature for classes 1 and 3. A less positive and less active relationship to nature for Class 2. Rebuilding the bonds of belonging to the living world and the power to act enables hope to get out of the eco-anxiety which affects young people today (Sauvé 2020). In that sense, Outdoor Education (OE)

represent another means to implement ESD in class. This education characterised as a set of practices and creative and thinking tools that allow environmental literacy and an agency with the world (Lausselet and Zosso 2022). The implementation of OE promotes experiential learning through sensitive and sensory approaches. Outdoor education also favours a place-based approach using the surroundings of the school as a learning place. The territorial anchoring of pupils is thus amplified and promotes the understanding of their belonging to the living world (Lausselet and Zosso 2022; Planche 2018). These different approaches are important from a cognitive point of view, as they allow for working on transdisciplinary skills such as questioning, problem solving, motivation to take part in action. The development of transverse skills such as empowerment, intellectual creativity and collaboration is also possible. This pedagogy therefore has benefits for the whole personality of the youth (Partoune et al. 2020).

Finally, in the results of rivers planning case study, creativity was absent in general, but more specifically in group 2. The creative potential of pupils can be worked on at school (Craft 2005) through four factors: cognitive, emotional, environmental and conative (Lubart et al. 2015). Moreover, the purpose of the tasks is transformed by working on creativity from a sustainability perspective. This creates intrinsic motivation that has the potential to change pupils' habits and behaviour in a sustainable way (Cheng 2019). Finally, Walsh, Chappell, and Craft (2017) advocate for creative learning whose benefits for society should be recognised by pupils in order to give them power and hope.

Conclusion

In conclusion, this paper categorised three groups of pupils according to their representations and attitudes of sustainability, their place of residence, their educational level and their relationship to nature. Group 3, *the confidant*, who represents the majority of pupils is related to dominant representations and social practices. Group 1, *the cognisant*, is similar but has a more pessimistic view of the future. Finally, Group 2, *the passive*, which comes mainly from pupils in VT path demonstrates a passive attitude towards sustainability. The analysis of the representations shows the importance of rethinking the aims of the school in order to reduce inequalities and introduce ESD oriented towards citizen empowerment.

The data were collected through an online survey with several limitations. First, the sample has an over-representation of urban pupils in PU. Secondly, the survey was self-reported. For this reason, misunderstandings may have arisen as a result of the misinterpretation of concepts or questions. Finally, pupils were not used to this type of exercise and may have felt discouraged by the complexity of the questions.

The results discussed in this paper have didactic implications which will be taken into account in a future phase of research by the collaborative creation of a teaching arrangement on rivers planning.

Note

1. According to the regulations in place in the Canton of Vaud, the researchers received the authorisation to collect data in classrooms from the Education Research Coordinating Committee of the HEP Vaud, the Department of Education and Vocational Training of the Canton of Vaud and the school principals.

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References

- Akaike, H. 1974. "A New Look at the Statistical Model Identification." *IEEE Transactions on Automatic Control* 19 (6): 716–723. doi:10.1109/TAC.1974.1100705.
- Allison, K. R., E. M. Adlaf, H. M. Irving, N. Schoueri-Mychasiw, and J. Rehm. 2016. "The Search for Healthy Schools: A Multilevel Latent Class Analysis of Schools and Their Students." *Preventive Medicine Reports* 4: 331–337. doi:10.1016/j.pmedr.2016.06.016.
- Balsiger, P., J. Lorenzini, and M. Sahakian. 2019. "How Do Ordinary Swiss People Represent and Engage with Environmental Issues? Grappling with Cultural Repertoires." *Sociological Perspectives* 62 (5): 794–814. doi:10.1177/0731121419855986.
- Barthes, A., and Y. Alpe. 2016. *Utiliser Les Représentations Sociales En Éducation: exemple De L'éducation au Développement Durable*. Paris: L'Harmattan.
- Bédouret, D., C. Vergnolle Mainar, R. Chalmeau, M.-P. Julien, and J.-Y. Léna. 2018. "L'hybridation Des Savoirs Pour Travailler (Sur) le Paysage En Éducation au Développement Durable." *Projets De Paysage* (18): 1–29. doi:10.4000/paysage.1034.
- Beitone, A., C. Dollo, E. Hemdane, and J.-R. Lambert. 2013. Prendre en compte les représentations des élèves. In *Les sciences économiques et sociales*, 117–153. De Boeck Supérieur. <https://www.cairn.info/les-sciences-economiques-et-sociales-9782804182564-page-117.htm>
- Cheng, V. M. 2019. "Developing Individual Creativity for Environmental Sustainability: Using an Everyday Theme in Higher Education." *Thinking Skills and Creativity* 33: 100567. doi:10.1016/j.tsc.2019.05.001.
- CMED. 1987. *Rapport Brundtland: Notre Avenir à Tous*. Montréal: Éditions du Fleuve.
- Craft, A. 2005. *Creativity in Schools: tensions and Dilemmas*. London: RoutledgeFalmer.
- Crutzen, P. 2002. "Geography of Mankind." *Nature* 415 (6867): 23. doi:10.1038/415023a.
- Curnier, D. 2017. *Quel Rôle Pour L'école Dans la Transition Écologique? Esquisse D'une Sociologie Politique, Environnementale Et Prospective du Curriculum Prescrit*. Université de Lausanne, Lausanne, Suisse.
- Curnier, D. 2021. *Vers Une École Éco-Logique*. Lormont: Le Bord de l'eau.
- DEF. 2022. *Ecole vaudoise durable*. Département de l'enseignement et de la formation professionnelle. <https://www.ecolevaudoisedurable.ch/vision-et-durabilite/education-la-durabilite>
- Felouzis, G., and S. Charmillot. 2017. "Les Inégalités Scolaires En Suisse." *Social Change in Switzerland* (8): 3–12.
- Freudiger, N., N. Fink, and A. Iseli. 2011. "Représentations D'élèves Sur le Développement Durable Et le Réchauffement Climatique." In *L'Éducation En Vue du Développement Durable: sciences Sociales Et Élèves En Débats*, edited by F. Audigier, N. Fink, N. Freudiger, and P. Haeberli, 93–113. Genève: Cahiers de la Section des Sciences de l'Éducation.
- Hess, G. 2018. *Éthiques De la Nature*. Paris: Presses universitaires de France.
- Hickendorff, M., P. A. Edelsbrunner, J. McMullen, M. Schneider, and K. Trezise. 2018. "Informative Tools for Characterizing Individual Differences in Learning: Latent Class, Latent Profile, and Latent Transition Analysis." *Learning and Individual Differences* 66: 4–15. doi:10.1016/j.lindif.2017.11.001.
- Hickman, C., E. Marks, P. Pihkala, S. Clayton, R. E. Lewandowski, E. E. Mayall, B. Wray, C. Mellor, and L. van Susteren. 2021. "Climate Anxiety in Children and Young People and Their Beliefs about Government Responses to Climate Change: A Global Survey." *The Lancet Planetary Health* 5 (12): e863–e873. doi:10.1016/S2542-5196(21)00278-3.
- Jones, R. A., N. Burnay, and O. Servais. 2000. Chapitre 6. Les enquêtes par questionnaire. In *Méthodes de recherche en sciences humaines*, 169–199. Louvain-la-Neuve: De Boeck Supérieur. doi:10.3917/dbu.jones.1999.01.0169.
- Kyburz-Graber, R., U. Nagel, and F. Gingins. 2013. *Demain en main: enseigner le développement durable: 9e - 11e HarmoS - Cycle 3 du PER LEP*. Lausanne: Loisirs et pédagogie.
- Lausselet, N., and I. Zosso. 2022. "Outdoor and Sustainability Education: How to Link and Implement Them in Teacher Education? An Empirical Perspective." In *Competences in Education for Sustainable Development: Critical Perspectives*, edited by P. Vare, N. Lauselet, and M. Rieckmann, 167–174. Berlin: Springer.
- Lotz-Sisitka, H., A. E. J. Wals, D. Kronlid, and D. McGarry. 2015. "Transformative, Transgressive Social Learning: Rethinking Higher Education Pedagogy in Times of Systemic Global Dysfunction." *Current Opinion in Environmental Sustainability* 16: 73–80. doi:10.1016/j.cosust.2015.07.018.

- Lubart, T., C. Mouchiroud, S. Tordjman, and F. Zenasni. 2015. *Psychologie De la Créativité*. 2e édition. Paris: Armand Colin.
- Macy, J., and M. Y. Brown. 2021. *Ecopsychologie Pratique Et Rituels Pour la Terre: revenir à la Vie*. Troisième édition revue et augmentée ed. Gap: Le Souffle d'or.
- Milfont, T. L. 2012. "The Psychology of Environmental Attitudes: Conceptual and Empirical Insights from New Zealand." *Ecopsychology* 4 (4): 269–276. doi:10.1089/eco.2012.0058.
- Moscovici, S. 1961. "La Représentation Sociale de la Psychanalyse." *Bulletin de psychologie* 14 (194): 807–810.
- Mutz, R., and H.-D. Daniel. 2013. "University and Student Segmentation: Multilevel Latent-Class Analysis of Students' Attitudes towards Research Methods and Statistics." *The British Journal of Educational Psychology* 83 (Pt 2): 280–304. 10.1111/j.2044-8279.2011.02062.x.
- Norton, B. G. 2010. "Sustainability." In *Sustainability*. Chicago: University of Chicago Press.
- Pache, A. 2017. "Développer la Pensée Prospective: Un Enjeu Fort De L'Éducation En Vue du Développement Durable." In *Devenir Acteur Dans Une Démocratie Technique*, edited by J. Didier, Y.-C. Lequin, and D. Leuba, 175–185. Belfort: Université de technologie de Belfort-Montbéliard (UTBM).
- Pache, A., D. Curnier, É. Honoré, and P. Hertig. 2016. "Penser L'avenir De Manière Créative: Un Enjeu Central De L'éducation En Vue du Développement Durable." *Revue Française De Pédagogie* 4 (197): 51–62. doi:10.4000/rfp.5152.
- Pache, A., S. Breithaupt, and J. Cacheiro. 2018. Former à l'enseignement d'une géographie renouvelée à l'école primaire. L'exemple des Lesson Study. *L'Information géographique* 82(3):115–131. <https://www.cairn.info/revue-information-geographique-2018-3-page-115.htm>
- Palsson, G., B. Szerszynski, S. Sörlin, J. Marks, B. Avril, C. Crumley, H. Hackmann, et al. 2013. "Reconceptualizing the 'Anthropos' in the Anthropocene: Integrating the Social Sciences and Humanities in Global Environmental Change Research." *Environmental Science & Policy* 28 (1): 3–13. doi:10.1016/j.envsci.2012.11.004.
- Paillé, P., and A. Mucchielli. 2012. *L'analyse qualitative en sciences humaines et sociales*. Paris: Armand Colin. <https://www.cairn.info/l-analyse-qualitative-en-sciences-humaines--9782200249045.htm>
- Partoune, C., H. Bernard, A.-C. Grodos, and G. Meunier. 2020. *Dehors, J'apprends*. Liège: Edi.pro.
- Patrick, M. E., Y. M. Terry-McElrath, J. E. Schulenberg, and B. C. Bray. 2017. Patterns of High-Intensity Drinking among Young Adults in the United States: A Repeated Measures Latent Class Analysis." *Addictive Behaviors* 74: 134–139. 10.1016/j.addbeh.2017.06.004.
- Planche, E. 2018. *Eduquer à L'environnement Par L'approche Sensible*. "Art, Ethnologie Et Écologie." Lyon: Chronique sociale.
- Raskin, P. 2008. "World Lines: A Framework for Exploring Global Pathways." *Ecological Economics* 65 (3): 461–470. doi:10.1016/j.ecolecon.2008.01.021.
- Raworth, K. 2017. "Why It's Time for Doughnut Economics." *IPPR Progressive Review* 24 (3): 216–222. doi:10.1111/newe.12058.
- Rockström, J., W. Steffen, K. Noone, Å. Persson, F. S. Chapin, E. F. Lambin, T. M. Lenton, et al. 2009. "A Safe Operating Space for Humanity." *Nature* 461 (7263): 472–475. 10.1038/461472a.
- Roy, P., and B. Gremaud. 2017. "Une Démarche D'investigation Interdisciplinaire Pour Traiter Des Problématiques d'EDD Dans Une Perspective D'instruction Et De Socialisation Émancipatrice." *Formation Et Pratiques D'enseignement En Questions* 22: 99–123.
- Sauvé, L. 2020. "Préface." In *Dehors, J'apprends*, edited by C. Partoune. Liège: Edi.pro.
- Schwarz, G. 1978. "Estimating the Dimension of a Model." *The Annals of Statistics* 6 (2): 461–464. doi:10.1214/aos/1176344136.
- Scrucca, L., M. Fop, T. B. Murphy, and A. E. Raftery. 2016. "mclust 5: Clustering, Classification and Density Estimation Using Gaussian Finite Mixture Models." *The R Journal* 8 (1): 289–317. doi:10.32614/RJ-2016-021.
- Steffen, W., K. Richardson, J. Rockström, S. E. Cornell, I. Fetzer, E. M. Bennett, R. Biggs, et al. 2015. "Planetary Boundaries: Guiding Human Development on a Changing Planet." *Science (New York, NY)* 347 (6223): 1259855. doi:10.1126/science.1259855.
- Sterling, S. 2011. "Transformative Learning and Sustainability: Sketching the Conceptual Ground." *Learning and Teaching in Higher Education* 5 (11): 17–33.
- UNESCO. 2017. *L'éducation En Vue Des Objectifs De Développement Durable*. Paris, France: UNESCO.
- UNESCO. 2020. *Education for Sustainable Development: A Roadmap*. Paris, France: UNESCO.
- Vare, P. E., N. E. Lasselet, and M. E. Rieckmann. 2022. *Competences in Education for Sustainable Development*. Berlin: Springer.
- Vare, P., and W. Scott. 2007. "Learning for a Change: Exploring the Relationship between Education and Sustainable Development." *Journal of Education for Sustainable Development* 1 (2): 191–198. doi:10.1177/097340820700100209.
- Vincent-Lancrin, S., C. González-Sancho, M. Bouckaert, F. d Luca, M. Fernández-Barrerra, G. Jacotin, J. Urgel, and Q. Vidal. 2020. *Développer la Créativité Et L'esprit Critique Des Élèves: Des Actions Concrètes Pour L'école. La recherche et l'innovation dans l'enseignement*. Paris: Éditions OCDE. doi:10.1787/8ec65f18-fr
- Walsh, C., K. Chappell, and A. Craft. 2017. "A co-Creativity Theoretical Framework to Foster and Evaluate the Presence of Wise Humanising Creativity in Virtual Learning Environments (VLEs)." *Thinking Skills and Creativity* 24: 228–241. doi:10.1016/j.tsc.2017.01.001.