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Sessão 2 - SOCIAL RESPONSABILITY AND ENVIRONMENT

SUSTAINABILITY, EDUCATION AND ENVIRONMENTAL MANAGEMENT: A CASE STUDY

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ABSTRACT

The current ecological crisis requires improvements in the way organizations are managed, in their environmental performance and in the level of environmental literacy held by human resources and general population. The consumption of natural resources, such as water, energy, and raw materials, represents a large part of the environmental impact associated with the functioning of societies and their organizations. The high production of waste is one of the consequences of this consumption, and its reduction should be prioritized. In this case study, environmental education and environmental management approaches are evaluated to reduce the use of drying hands paper towels at the restrooms of the University of Madeira (Portugal).

Paper towel consumption comparisons, between the reference situation (2018) and different periods along 2019-2022, allows us to conclude that only the environmental management measures have been successful. Unlike environmental education campaigns, only the removal of paper towels dispensers in restrooms with electrical hand-dryers available made possible significant reductions in the consumption.

Keywords: environmental education; environmental management; sustainability; University of Madeira; wastes.

SUSTENTABILIDADE, EDUCAÇÃO E GESTÃO AMBIENTAL: UM CASO DE ESTUDO

RESUMO

A atual crise ecológica exige melhorias na forma como as organizações são geridas, no seu desempenho ambiental e no nível de literacia ambiental detido pelos seus recursos humanos e pela população em geral. O consumo de recursos naturais, como água, energia e materiais primas, representa grande parte do impacte ambiental associado ao funcionamento das sociedades e das suas organizações. A elevada produção de resíduos é uma das consequências desse consumo, devendo ser prioridade a sua redução. Neste caso de estudo, avaliam-se abordagens de educação ambiental e de gestão ambiental para alcançar esse propósito relativamente ao uso de toalhetes de papel para enxugar as mãos, após as idas à casa de banho na Universidade da Madeira (Portugal).

A comparação dos consumos de toalhetes de papel entre a situação de referência (2018) e diferentes períodos entre 2019 e 2022, permite-nos concluir que apenas as medidas de gestão ambiental obtiveram sucesso. Ao contrário das campanhas de educação ambiental, apenas a remoção dos dispensadores de toalhetes de papel nas casas de banho com secadores de mão elétricos possibilitou reduções significativas nos consumos.

Palavras-chave: educação ambiental; gestão ambiental; resíduos; sustentabilidade; Universidade da Madeira.

1. INTRODUCTION

Humanity is facing an environmental global crisis with imbalances that goes from climate change to biodiversity loss, including water and air pollution, deforestation, microplastics in the environment, and, among many others, resource scarcity (Hufnagel et al., 2020). To tackle this ecological emergency and achieve sustainability, humans must change the way they live and organize their societies, and, to that, a cultural transformation must occur (Ridei et al., 2014). Move on towards an environmental culture means to change our complex system of codes, standards, and forms of organization in order that they could contribute to the maintenance of environmental balance. It means to ensure the environmental sustainability of a community through the change of our norms, beliefs, values, concepts, knowledge, habits, practices, technologies, expectations, lifestyles, institutions, and models of social and economic organization (Spínola, 2021a). We believe that this is an already ongoing process that could be seen in the way people and organizations are changing their practices, namely, to save energy and water, reduce waste production and recycle more.

1.1. Literature review

Environmental education has as its main purpose to promote environmental literacy, an essential task to improve environmental quality through the adoption of pro-environmental practices (Disinger & Roth, 1992). The concept of environmental literacy includes a wide range of aspects, namely knowledge and understanding of environmental concepts, problems and issues, a set of cognitive and affective dispositions, and a series of cognitive skills and competences, together with the appropriate behavioural strategies to implement this knowledge and understanding to make effective and relevant decisions in different environmental contexts (Cook & Berrenberg, 1981; Hollweg et. al., 2011; Hungerford & Volk, 1990; Simmons, 1995; Spínola, 2021b; Stern, 2000). As so, it is expected that an environmental literate citizen will voluntarily adopt the practices that could reduce its negative impacts on the environment, improving their contributions for sustainability. On the other hand, environmental management is the practices adopted by an organization to monitor and control the impact of their activities on the natural environment, and includes planning and implementing measures and technologies to achieve previously defined objectives (Montabon, 2007). Despite environmental management benefits from environmental education approaches, it is dependent on the determinations issued by leaders and the respective practices and solutions implemented. It distinguishes itself from the direct effect of individual pro-environmental behaviours that results from environmental literacy because it is not a voluntary decision of each member from the organization but

rather of the organization itself, even if, at the organization, the decision may come from a single individual (a leader).

Because we are short in time, the ongoing cultural transformation process must move faster, needing to urgently traduce itself in practical and effective changes in our daily lives. Present case study is a contribution for the validation of a previously proposed conceptual framework to drive environmental culture (Spínola, 2021b). Environmental culture was defined as a complex system of codes, standards and forms of organization shared by a society, or a social group, learned through education and socialization, and that contributes to the maintenance of environmental balances. It manifests itself through norms, beliefs, values, attitudes, concepts, knowledge, habits, practices, behaviours, technologies, expectations, lifestyles, institutions, and models of social and economic organization that, as a whole, ensure the environmental sustainability of a community (Spínola, 2021b). The framework to promote environmental culture is based in a holistic and sociocultural approach to build an environmental educating community (Figure 1). It depends on a lead-off step to trigger the process and fuel it, constituting the driving force that will promote environmental best practices and environmental education programs. In a second stage, environmental best practices and environmental education programs, with close involvement of the community and with its organization and management, would transform the sociocultural context in which the community live and function. The new sociocultural context will lead to a third stage, in which an environmental educating community starts to be established, environmental sustainability to be achieved and environmental culture to be promoted. Through this process, a continuous improvement cycle keeps moving further as political and social will increases with the establishment of environmental culture.

In short, the main practical mechanisms that shape the above framework are environmental education programs committed with a social and practical approach, together with an environmental management to assure the implementation of best practices in real sociocultural contexts with the ability to embody the functioning and experience of the community.

The approach proposed is supported on Julian Steward (1955) and its ‘cultural ecology’, which gave an important contribution to our understanding of the human-nature interaction and explain the cultural changes caused by the need for environmental adaptation. Since culture is superorganic, Julian Steward defended that it is the culture that adapt, not the individual. Also, later, Félix Guattari (1992), under the new concept of the ‘ecosophy’ or ‘ecophilosophy’, stated that mentalities change only with modifications to the social and material environment. As so, to tackle the present ecological crisis, environmental education needs to address social changes, more than individual. To do so, environmental education needs to be supported by physical and organizational changes on the contexts in which people live, which means that it needs to be supported by environmental management.

1.2. Purpose of the study

Present case study is a contribution for the validation of a previously proposed conceptual framework to drive environmental culture. It goes through the practices of drying hands to explore the relevance and efficiency of two different approaches to change behaviours towards sustainability: environmental education and environmental

management. Additionally, it is also used to analyse the relevance of environmental management for environmental education, and vice-versa.

1.3. Place characterization

The University of Madeira is a public institution of higher education established in 1988 in the city of Funchal (Madeira Island- Portugal), assuming itself as a centre for the creation, transmission and dissemination of culture, science, and technology at the service of the humanity. It aims to prepare its students to be technically and scientifically competent, cultured, and innovative citizens, acting on the basis of the values of transparency, justice, equality, fraternity and to the sustainable development of the Planet. The University of Madeira is made up of 4 faculties (Arts and Humanities, Exact and Engineering Sciences, Social Sciences, and Life Sciences) and 2 higher schools (Health, and Technology and Management), involving around 3500 students distributed over 20 degrees, 23 masters, 8 doctorates and 16 Professional Higher Technical Courses. The teaching staff is made up of more than 230 professionals and

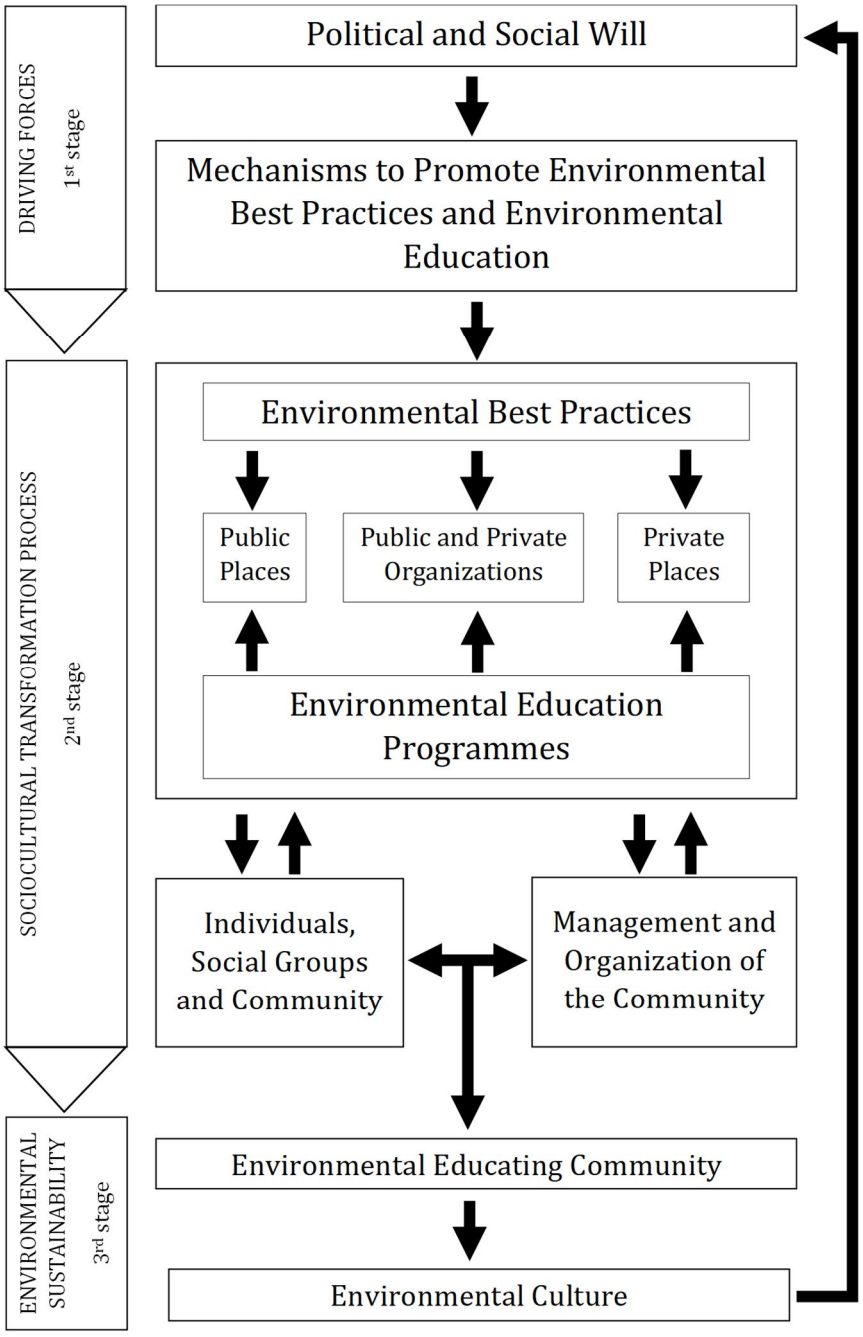


Figure 1- Conceptual framework to drive environmental culture organized in 3 stages and on environmental educating communities (Spínola, 2021b).

the institution's operation is supported by the involvement of 138 non-teaching staff. Despite its universal mission, the University of Madeira assumes a special commitment with the insular region where is located and from where comes the big majority of its students. The teaching and research activities are concentrated in a single pole, the Penteada Campus, which, besides classrooms, laboratories, offices, a library, a canteen, a bar, parking lines and a garden, is provided with 60 restrooms. From these, together with the 12 restrooms for persons with reduced mobility, 24 are located along the corridors that gives access to classrooms and, because of that, they are the most used. Since the beginning, the methodology available in all restrooms to dry hands was disposable paper towels, despite 6 of them, with little use because of their marginal

localization, already had electrical hand-dryers. Since September 2021, half of the 24 most used restrooms were provided with electrical hand dryers, but paper towel dispensers were kept as an option to be chosen by users. Finally, at the end of October 2022, for all the 18 restrooms with electrical hand dryers the paper towels dispensers were removed. In the beginning of 2019, a waste characterization campaign showed that the use of disposable paper towels to dry hands at the restrooms of the University of Madeira was a major contributor (22%) for waste production.

2. METHODOLOGY

Since April 2019 an environmental education campaign was put in place with the purpose of reducing the consumption of disposable paper towels to dry hands at the restrooms of the University of Madeira. The approach used included information posted on the paper towel dispenser with instructions on how to use only one sheet (Figure 2): 1. shake hands very well in the washbasin; 2. collect only one sheet of paper towel; 3. dry your hands; 4. put the paper towel in the trash bin. Additionally, personal and reusable cotton scarfs were promoted through an approach of individual social influence, together with its free distribution (Figure 3). In total, 145 volunteers, mostly students but also staff and teachers, compromise themselves to adopt a reusable cotton scarf and promote its use among friends and colleagues on the drying hands needs, and more than 500 scarfs units were freely distributed to members of the academic community.

Since September 2021, half of the 24 most used restrooms were provided with electrical hand-dryers, but paper towel dispensers were kept as an option to be chosen by users. Since then, together with the previously 6 restrooms already with that equipment and besides the paper towel dispensers, 30% of the restrooms had electrical hand-dryers (Figure 4). In each electrical hand-dryer, an information was posted citing a study concluding that it is a methodology environmentally much more advantageous than the use of paper towels and asking people to use it. In fact, after life cycle assessment approaches, several studies have shown that the use of electrical hand-dryers are much more advantageous from an environmental and economic point of view than paper towels (Gregory at al., 2021; Coller et al., 2021). Finally, since the end of October 2022, to all the 18 restrooms with electrical hand-dryers available, paper towel dispensers were removed by the decision of the managing services of the University of Madeira.

Figure 2- Instructions posted on the paper towel dispenser on how to use only one sheet to dry hands.

Figure 3- Initiative to promote the use of individual reusable cotton scarfs to dry hands after the use of restrooms at the University of Madeira.

Figure 4- Electrical hand-dryers available in 30% of the restrooms at the University of Madeira since September 2021.

To evaluate the success of environmental education campaigns and, later, the installation of electrical hand-dryers, the amount of paper towels used in the restrooms of the University of Madeira was obtained from the accounting service and considered for analysis. Because the coronavirus disease 2019 (COVID-19) pandemic strongly conditioned the activities at the University of Madeira between 2020 and 2021, data influenced by this event was considered as a side period. Paper towels consumption data was plotted in a graphic considering the following periods: Baseline reference, from January 2018 until Marsh 2019; Environmental education campaigns development, from April 2019 until February 2020; Coronavirus disease 2019 pandemic influence, from Marsh 2020 until September 2021; Electrical hand-dryers available alongside with environmental education campaigns, from October 2021 until October 2022; and Paper towel dispensers removal from restrooms with electrical hand-dryers, since November 2022.

3. RESULTS AND DISCUSSION

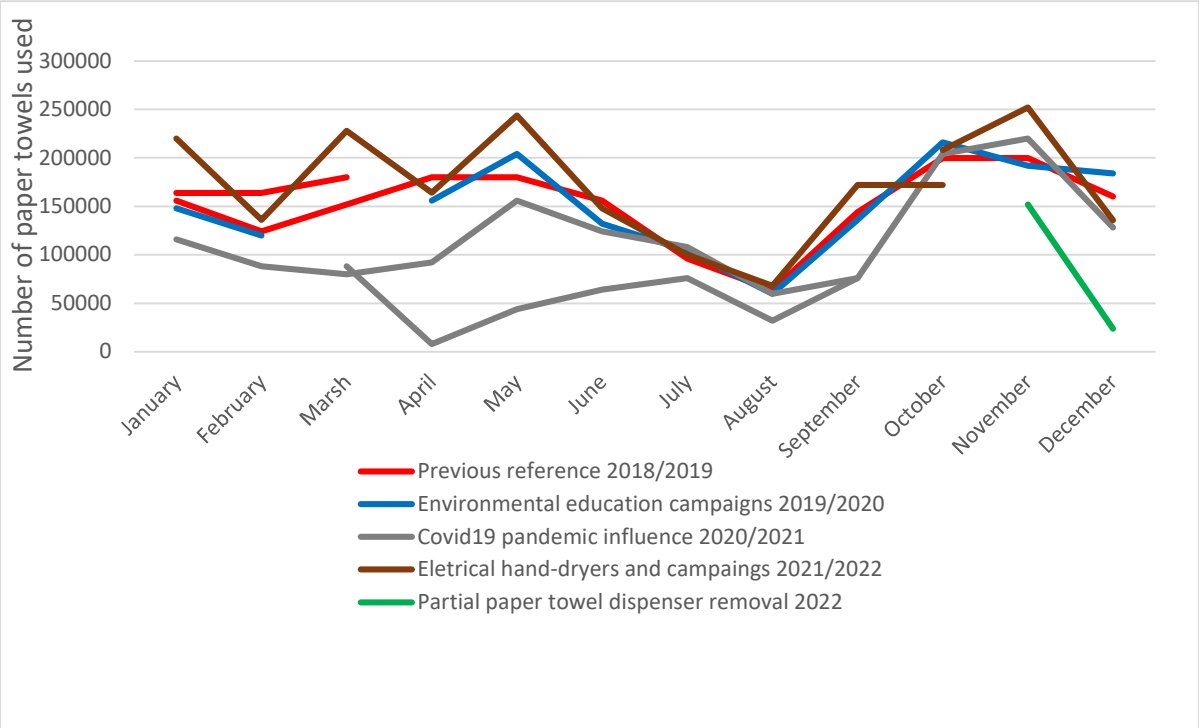
Table 1 and Graphic 1 shows data from disposable paper towels consumption at the restrooms of the University of Madeira for different periods that spans from 2018 until 2022: Baseline reference; Environmental education campaigns development; Coronavirus disease 2019 pandemic influence; Electrical hand-dryers available; and

Paper towel dispensers removal from restrooms with electrical hand-dryers. A general analyses of paper towel consumption for each month shows a big variation along the year, particularly reduced, as expected, in July, August and September as a consequence of the summer school break. Also, the general tendency for a lower consumption of paper towels on February, April, June and December can be explained with the school breaks for evaluations at the end of both semesters (February and June), and for Easter (April) and Christmas (December).

Except for the period of influence of the Coronavirus disease 2019 pandemic, in which most academic activities at the University of Madeira took place online or were suspended, neither the development of environmental education campaigns nor the availability of electrical hand-dryers shows an influence on the reduction of paper towel consumption. On the contrary, despite the continuation of the environmental education campaigns and the availability of electrical hand-dryers in 30% of the restrooms, an increase in paper towel consumption is evident when activities returned to normal in 2021/2022, after pandemic outbreak.

Table 1: Number of paper towels sheets consumed by moth between 2018 and 2022 at the restrooms of the University of Madeira.

Month↓ Year→	2018	2019	2020	2021	2022	Monthly average
January	156000	164000	148000	116000	220000	160800
February	124000	164000	120000	88000	136000	126400
Marsh	152000	180000	88000	80000	228000	145600
April	180000	156000	8000	92000	164000	120000
May	180000	204000	44000	156000	244000	165600
June	156000	132000	64000	124000	148000	124800
July	96000	104000	76000	108000	100000	96800
August	64000	60000	32000	60000	68000	56800
September	144000	136000	76000	76000	172000	120800
October	200000	216000	204000	208000	172000	200000
November	200000	192000	220000	252000	152000	203200
December	160000	184000	128000	136000	24000	126400
Total	1812000	1892000	1208000	1496000	1828000	137267
Monthly average	151000	157667	100667	124667	152333	



Graphic 1: Evolution of the number of paper towels sheets consumed by month at the restrooms of the University of Madeira along different periods between 2018 and 2022.

We believe that this increase is related to the new hand hygiene habits promoted and induced by preventive care in relation to Covid19 infection. As so, despite our local observations revealed a low use of the electrical hand-dryers when restrooms had also paper towels available, we can't conclude with certainty that electrical hand-dryers didn't result in some attenuation in this post-pandemic consumption increase. However, along 2019 and the beginning of 2020, period when the island of Madeira had not yet been hit by Covid19 and, as so, its influence on hand washing habits wasn't expected, we can't also find any influence of the environmental education campaigns. On that period and after, we expected to obtain a reduction on paper towel consumption due to a most efficient use of it and, also, from the use of individual cotton scarfs, but it didn't occur. A most efficient environmental education approach is needed to obtain positive results.

With a different result is, since the 1st November 2022, the removal of paper towel dispensers at the restrooms with electrical hand-dryers. Despite the short period available so far (2 months), the reduction is evident. Paper towel consumption along November and December 2022 was 55% lower than in 2021, 53% lower than in 2019, and 51% lower than in 2018, for the same period. As so, we can conclude that, despite the environmental education efforts, only when paper towels are not available the use of the electrical hand-dryers, or other methods, take place. It is noteworthy that, for some observations made on the contain of waste bins, even when the restroom doesn't have paper towel dispensers, some opt to use toilet paper to dry hands instead of the

electrical hand-dryer. As so, despite the efficacy of the environmental management option of removing paper towels dispenser when electrical hand-dryers are available, effective environmental education campaigns continue to be needed to convey environmental knowledge, attitudes and behaviour.

Additionally, the substitution of paper towel dispensers by electrical hand-dryers is a cost-effective measure. The installation of the 12 electrical hand-dryers on half of the most used restrooms represented an investment of 2235 euros, and, at least, a 50% reduction on paper towel consumption was achieved, saving around 2000 euros in its annual costs (but with an increase of about 400 euros on electricity annual consumption), it will take less than two years to achieve capital recovery, and, after that, with a revenue of savings of more than 1500 euros a year. Considering a scenario of total replacement of paper towel dispensers by electrical hand-dryers at the University of Madeira, it will need an investment of about 7800 euros, but it will save 4000 euros a year in paper towels. Considering the estimative of 1000 euros annual costs on electricity for hand-dryers, it will take 2.5 years for capital recovery and, after that, with a revenue of savings of around 3500 euros a year. Besides costs, total changing from paper towels to electrical hand-dryers could also prevent the production of about 4 tons of wastes each year, which represents about 15% of the municipal solid wastes produced at the University of Madeira Campus.

4. CONCLUDING REMARKS

Present research shows that environmental management approaches could easily than environmental education achieve results on environmental performance. However, it is also evident that environmental education should always assist environmental management approaches, even if only with the purpose of the adopted measures being accepted in the best possible way. Besides, we conclude that environmental education can’t be done only based on information, adequate socio educational approaches are needed to a better performance. Although a social framework was planned for the adoption of cotton scarfs to dry hands, this approach was not successful. Contrary to what was intended, it was not possible for this behavior to become visible through the team of volunteers and, from then on, to disseminate in the academic community. Future approaches should ensure that the volunteers' action is done as a group and not individually, giving them social visibility to increase their power of influence in the academic community.

5. RESEARCH IMPLICATIONS

Results from present research support the relevance of environmental management approaches and strategies to achieve a higher environmental performance on organizations. Also, it shows that environmental education campaigns, especially those that intends to change behaviours, need to be conveniently designed and implemented with a good support in the involvement of the community. As so, for the specific purpose

of reducing the consumption of paper towels at the restrooms of the University of Madeira, it will be recommended an expansion of electrical hand-dryers for other restrooms with a progressive abandonment of paper towel dispensers. Additionally, with the lessons learned, a new environmental education campaign should be started to promote the use of individual cotton scarfs as the environmental best option for hand drying.

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REFERENCE

Coller, G., Schiavon, M. & Ragazzi, M. (2021). Environmental and economic sustainability in public contexts: the impact of hand-drying options on waste management, carbon emissions and operating costs. Environment, Development and Sustainability 23: 11279–11296. https://doi.org/10.1007/s10668-020-01109-x

Cook, S., & Berrenberg, J.L. (1981). Approaches to encouraging conservation behavior: a review and conceptual framework. Journal of Social Issues, 37 (2), 73-107.

Disinger, J.F. & Roth, C.E. (1992). Environmental Education research news. The Environmentalist, 12: 165-168.

Gregory, J. R., Montalbo, T. M., & Kirchain, R. E. (2013). Analyzing uncertainty in a comparative life cycle assessment of hand drying systems. International Journal of Life Cycle Assessment, 18, 1605–1617.

Guattari, F. (1992). Pour une refondation des pratiques sociales. In: Le Monde Diplomatique (Oct.): 26-27. Accessed 15th November 2022 at https://www.monde-diplomatique.fr/1992/10/GUATTARI/44749.

Hollweg, K.S., Taylor, J.R., Bybee, R.W., Marcinkowski, T.J., McBeth, W.C., & Zoido, P. (2011). Developing a framework for assessing environmental literacy. Washington, DC: North American Association for Environmental Education.)

Hufnagel, L., Pálinkás, M., Mics, F., & Homoródi, R. (2020). Introductory Chapter: The Present Global Ecological Crisis in the Light of the Mass Extinctions of Earth History. In (Ed.), Changing Ecosystems and Their Services. IntechOpen. https://doi.org/10.5772/intechopen.90186

Hungerford, H.R. & Volk, T. (1990). Changing learner behavior through environmental education. The Journal of Environmental Education, 21 (3), 8-22.

Montabon F.L., Sroufe R., Narasimhan R (2007). An examination of corporate reporting, environmental management practices and firm performance. J. Oper. Manag; 25:998–1014. doi: 10.1016/j.jom.2006.10.003.

Ridei, N., Rybalko, Y., Kycherenko, Y., Palamarchuk, S., & Shofolov, D. (2014). The role of ecological culture as an indicator of sustainable development of relations between

society and nature. European Scientific Journal, 9(10). https://doi.org/10.19044/esj.2013.v9n10p%p.

Simmons, D. (1995). Developing a framework for National Environmental Education Standards. In Papers on the development of environmental education standards (pp. 10-58). Troy, OH: NAAEE.

Spínola, H. (2021a). Towards Environmental Culture. In S.A. Kiray & E. Tomevska-Ilievska (Eds.), Current Studies in Educational Disciplines 2021 (pp. 61–76). ISRES Publishing. https://www.isres.org/towards-environmental-culture-239-s.html

Spínola, H. (2021b) Environmental culture and education: a new conceptual framework. Creative Education, 12, 983-998. http://hdl.handle.net/10400.13/3447

Stern, P. (2000). Toward a coherent theory of environmentally significant behavior. The Journal of Social Issues, 56 (3), 407.

Steward J.H. (1955). Theory of Culture Change: The Methodology of Multilinear Evolution. University of Illinois Press, Urbana. 244 pp.