

Environmental Sustainability Through Education: Consistently Changing Behaviours Among Educational Projects

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Abstract

Environmental sustainability has become increasingly important over time. Education plays a fundamental role in making communities greener by disseminating good practices and sharing experiences with more sustainable behaviours and lifestyles. This paper aims to assess the importance of schools in changing the behaviour of different stakeholders, particularly, students, and teachers. The data used in this study was collected as part of an ERASMUS KA2 project, the "Make it Greener" project (Project number: 2021-1-NO01-KA220-SCH-000027764), which aims to share experiences and exchange information that constitute a driving force for this common goal of changing mentalities with a view to sustainable and truly environmentally friendly development. During the program, different activities were carried out which proved to be drivers for changing behaviour or perceptions regarding sustainability.

Keywords: Sustainability; education; environmental behaviour, Erasmus projects, changing behaviours.

1. Introduction

The "Make It Greener!" project is the result of a partnership between five schools across Europe, schools that reflect very different cultures and backgrounds. Despite their differences, they are committed to a single goal: making their communities greener by disseminating good practices and sharing experiences. The bottom line is that our schools and, consequently, the entire student population, including their families, should be more environmentally friendly and adopt more sustainable behaviours and lifestyles. Adopting more sustainable lifestyles is a learning process and, as such, it takes time. However, the authors consider that the mobilities involved in the project, the sharing of experiences, and the exchange of information have been a driving force towards this common goal of changing mentalities to achieve sustainable and truly environmentally friendly development. Achieving a real change in environmental concerns is only possible if we work together, as a network, and follow the motto "Think globally, act locally". There is an obvious need for us all to live more sustainable lives and to live up to the UN's Sustainable Development Goals. The target groups of the project are the students and teachers in our schools, as well as the local communities. To create a more green and sustainable future, we need to act locally, while thinking globally. The acronym G.R.E.E.N. stands for "Growing Responsibly, Enhancing European Network" and it encapsulates the main ideas behind the project. We are in the Age of the Anthropocene, the period marked by man's impact on the environment, and it is genuinely important to make young people aware of the importance of making sustainable choices. This project is designed to be an instrument for raising awareness among young people, the students from the schools involved in the project, of good sustainable, and environmentally friendly practices.

The scope of this paper is to assess the extent to which all the activities carried out during

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the various activities served to change behaviours or perceptions regarding sustainability. Schools, regardless of the level of education considered, are an essential element in promoting sustainability practices through the enhancement of values, and changes in attitudes and behaviours towards environmental issues, with the task of preparing young people (and families) for conscious, dynamic, and informed citizenship in the face of current environmental issues.

During the term of the project, there were several mobilities involving groups of students, teachers, and staff from the schools involved. To assess the impact of the actions carried out by the different partners and evaluate a possible change in behaviour towards more sustainable practices, questionnaires were administered to teachers, students, and families at the beginning and end of the project, with the groups being closed to determine the impact on those involved.

Students will enhance 21st-century skills like communication and problem-solving skills, feel connected in their commitment, and experience self-efficacy by seeing that their action has an impact. When "Make It Greener!" resources and outputs are integrated into the curricula, it will lead to a change in consumption habits, which affect educational outcomes positively. From a wider perspective, it will contribute to the quality of sustainable living and green skills. Teachers gain more proficiency by working cross-curricular and in different teams, by developing various skills and they will become sustainability experts to guide future students to a responsible attitude towards consumption. The teachers involved in the project have improved their competencies in organizing and executing a complex international project. With the help of this project, the participating schools have achieved more sustainability, learned, and implemented more ecological and environment-friendly procedures, and adopted a greener attitude in their communities. Official organizations and stakeholders can now use our schools as examples for any project related to the Environment and Sustainability or as a starting base for future similar projects. Overall, schools have managed to establish a wider network regionally and on a European level, which is needed to make a lasting impact.

2. Methodology

This study aimed to understand the impact of the project on the involved stakeholders, namely students, and teachers. For that, a questionnaire was designed to be applied at the start of the project with all the data processed anonymously and quantitatively. At the end of the project, the same questionnaire was applied to the same sample, assessing the progress made more objectively and concretely. The essential objective is to understand whether participation in the project promoted behavioural changes in everyday life in terms of environmental sustainability.

Regarding the sample, students' questionnaires were made by 62 students, the majority between 13 and 18 years old and some of them with more than 18 years old, 24.2% from Slovakia, 24.2% from Portugal, 25.8% from Türkiye and 25.8% from Norway. More than 70% of the students go to school by public transportation. Parents questionnaires were made by 74 parents, the majority (more than 60%) from 44 to 54 years old, 21.6% from Slovakia, 27% from Portugal, 29.7% from Türkiye and 21.6% from Norway. The authors applied surveys to 23 teachers that are, somehow, related to the project. 39.1% were from Portugal, 21.7% from Norway, 21.7% from Türkiye and 17.4% from Slovakia. The majority were between 33 to 54 years old.

3. Literature Review

The issue of sustainability and more conscientious behaviour on this theme has grown in importance over time. Among the approaches, the role of education in changing the behaviour of new generations, who tend to be more concerned and alert to environmental issues, has been relevant. Education can be an essential tool to achieve sustainability (Hopkins & McKeown, 2002). Educating for sustainability means educating for the

emergence of a possible and different world (Gadotti, 2010). The topic of education for sustainable development has been the subject of distinct and varied studies [(Hedefalk et al., 2015); (Boeve-de Pauw et al., 2015); (Pinkelman et al., 2015); (Gottlieb et al., 2012); (Little & Green, 2009); (Hopkins & McKeown, 2002)]. Higgs & McMillan (2006) argue that modelling sustainability either in individual models, school facilities and operation, school governance or school culture is a valuable approach to sustainable education, promoting both learning and adoption of sustainable behaviours in these schools.

Gottlieb et al. (2012) find education widely recognized as a means of promoting environmental sustainability, with numerous schools introducing the idea of sustainability into the educational agenda and curricula through the principle and analysis of the "ecological footprint," which illustrates the impact of community lifestyles on the environment. Hopkins & McKeown (2002) advance that people's awareness, education, and training as essential and central for society to move towards sustainability.

Hedefalk et al. (2015) highlight the evolution that has occurred with the change in the paradigm of teaching children, having changed from the approach to facts about the environment and sustainability issues to a focus on educating children to take action to change and adopt sustainable and environmental behaviours. This new approach aims to educate more competent children who can think for themselves and make more considered decisions (Hedefalk et al., 2015). On the other hand, it is crucial to distinguish between education on sustainable development focused on awareness with varied interpretations of the scope and education for sustainable development where the emphasis is on using education to foster sustainability (Hopkins & McKeown, 2002).

Olsson et al. (2016) argue that the implementation of educational policies for sustainable development with an explicitly oriented approach in education with the use of the concept of sustainability awareness as a holistic view of sustainability. Simultaneously, factors considered to be facilitators (staff buy-in, school management support and coherence) and the main barriers (staff buy-in and resources, both in terms of money and time) of positive behavioural interventions and supports in schools towards sustainability are determined and identified (Pinkelman et al., 2015). Also, McIntosh et al. (2014) validate the importance of school management support, as well as school team functioning, for the implementation of sustainability policies in education.

Boeve-de Pauw et al. (2015) assess the extent to which education can be labelled as holistic and/or pluralistic, with results indicating that education can indeed impact students' outcomes in terms of their sustainability awareness. Also, higher education has a key and extremely relevant role in training future teachers who will be able to make sustainable decisions and simultaneously integrate sustainability into their classes, with a real impact on increasing concerns about sustainability issues in society (Cavas et al., 2014). Alternatively, one of the solutions followed by some schools in some countries in implementing and conducting environmental education with their students is outsourcing, with the assignment of these competencies to external environmental organizations that develop and conduct the programs (Goldman et al., 2013). According to Goldman et al. (2013), these programs develop in students a greater perception of man's role as part of the environment, a greater sensitivity to human impact on the environment, with a more ecocentric orientation.

Gadotti (2010) reflects on the potential of educational practices oriented towards sustainability can contribute to the reformulation of contents and learning methods and to the quality of education itself, with a focus on eco-pedagogy, a holistic pedagogy that overcomes the anthropocentrism of classical pedagogies. Sukma et al. (2020) analyze the importance referred by teachers to the integration of environmental education into the learning process in the classroom for elementary school students, despite the lack of time. Yeung et al. (2016) advocate the positive effects of positive behavioural intervention in schools and should focus on the fidelity of implementation at the classroom level, as well as the development and validation of assessment tools for sustainability. Schelly et al. (2012) take a more empirical approach with the analysis of how conservation efforts have contributed to sustainability education and the adoption of sustainable behaviours in

educational and organizational practice.

Various studies have been carried out over time to empirically assess behavioural changes in students [(Debrah et al, 2021); (Žalėnienė & Pereira, 2021); (Cottafava et al, 2019); (Ribeiro et al, 2021); (Ramadhan et al, 2019); (Amran et al, 2019); (Nousheen et al, 2020)]. The development of citizenship capable of understanding the complexity of environmental issues and actively participating in their resolution is fundamental, with teachers playing a central role in this development, based on requirements for student autonomy and action planning as a prerequisite for creating a generation of critical people who solve new environmental problems and maintain or improve environmental quality on a local or global scale (Short, 2009).

Chankrajang & Muttarak (2017) assess the existence of ecological returns to education in terms of pro-environmental behaviour, concluding that schooling leads to a greater propensity for knowledge-based ecological actions, but not cost-saving pro-environmental actions. On the other hand, Wu (2002) concludes the importance of Green Schools in learning environmental education. On the other hand, the study carried out with primary school students by Alp et al. (2008) shows that behaviour towards the environment is independent of their knowledge of environmental issues. Hoang & Kato (2016) describe in detail the evolution of the environmental education of primary school students with an analysis before and after a workshop with extremely positive results in the knowledge of waste management and environmental impacts. The study carried out by Zsóka et al. (2013) determines a strong correlation between the intensity of environmental education and students' environmental knowledge, partly due to the environmental education itself and partly to the greater intrinsic motivation of students who voluntarily participate in environmental education.

From the literature review carried out, several broad hypotheses can be drawn that will be tested in the study carried out:

H1. Teachers play an essential role in raising students' awareness of environmental issues.

H2. Students are increasingly alert to environmental issues, and there is a new generation with greater awareness of these issues.

These study hypotheses will be detailed in sub-hypotheses that will be evaluated in different questions posed to the specific groups of stakeholders: teachers, and students:

H1.1. Teachers consider the school's role in the commitment to the future of the planet to be fundamental.

H1.2. Teachers consider it essential to include sustainability and green issues in the school curriculum.

H1.3. Teachers are aware of the school's role in implementing sustainability projects and change their behaviour with these projects.

H2.1. Students are aware of the importance of sustainability issues.

H2.2. Students change their behaviour in response to sustainability projects implemented at school.

3.1 Make it Greener Project

The "Make It Greener!" project served as a starting point for acquiring knowledge, exchanging experiences, and encouraging changes. By taking part in this project, the students from the schools involved will act as green ambassadors and ensure that the project's ideas are taken to a wider audience. The educational institutions involved in the project were:

- Aksu Ucak Bakim Teknolojisi Meslek Ve Teknik – Aircraft Maintenance Technology

Vocational and Technical High School, located in Antalya, Anatolia, Turkey;

- INETE - Institute of Technical Education, a secondary vocational school belonging to the ENSINUS - Estudos Superiores, SA., in Lisbon, Portugal, an “Eco-School”.

- ISG – Instituto Superior de Gestão, a higher education school with courses in management and economics, belonging to the ENSINUS - Estudos Superiores, SA., in Lisbon, Portugal;

- Spojena Skola – Secondary school in Svidnik, Slovakia, a “Green School”;

- Trondheim Katedralskole – Secondary school in Trondheim, Norway, an “Eco-friendly school”.

Each school targeted a specific topic and led the transformation process not only in its community but also in the other partner schools.

4. Results and Discussion

Regarding the results of the pre-test questionnaires given to the students, the results show that sustainability is a concern for them, with 91.9 per cent confirming this stance.

Almost half of the students (45.2 per cent) said they knew the UN's sustainability goals quite well. It should be noted that 77.4% of students say that their school has the necessary resources to implement a sustainability project, with 87.1% of students emphasizing the importance of developing a sustainability project at school. On the other hand, 80.6% believe that being part of a sustainability project at school will change some of their daily routines. When asked about the importance of European projects on the theme of sustainability and their impact on the school, the majority (66.1%) considered it to be quite important. At the same time, 72.5 per cent considered it "important" or "extremely important" to create a school commitment to the future of the planet. About the three environmental problems that most concern them, the most frequently mentioned options were global warming (69.4 per cent), air pollution (50 per cent) and wasting water (43.5 per cent).

After the project, 96.8 per cent of the students said that the sustainability of the planet was a concern for them. 54.8 per cent say they know the UN's sustainability objectives quite well and 17.7 per cent very well. Regarding the implementation of a sustainability project at school, 83.9% agree that the school has the necessary resources for implementation, with 62.9% considering it extremely important to carry out a sustainability project at school and 82.3% believing that this type of project in a school environment has an impact on changing their daily routines.

Regarding the importance of a European sustainability project and its impact on the school, 48.4% consider it extremely important. Regarding the importance of creating a school commitment to the future of the planet, the majority (58.1%) consider this commitment to be extremely important, with the most important environmental problems being global warming (71%), water waste (53.2%) and air pollution (51.6%).

About the pre-tests given to teachers, 100% said that sustainability is a concern for them, with 91.3 per cent considering that the school has the necessary resources to implement a sustainability project and 78.3 per cent of teachers considering it extremely important to carry out a sustainability project with the students and 56.5 per cent defending it as extremely important to have a European project that addresses sustainability issues in the school environment. Most teachers (91.3%) believe that taking part in sustainability projects at school will change some of their daily routines. On the other hand, 82.6% of teachers consider it extremely important to create a school commitment to the future of the planet, with the entire sample validating the importance of sustainability and environmental issues in the school curriculum. Concerning the environmental problems, they want their pupils to be more aware of, the results show global warming (87%), water waste (65.2%)

and air pollution (43.5%).

After the project, the questionnaires show that all the teachers say that sustainability is a concern for them. Concerning development, 87% felt that the school had the necessary resources to implement a sustainability project. 60.9% said that it was extremely important to have a European project on sustainability issues and that this could have an impact on the school, students, and teachers. Also, 78.3% considered it extremely important to create a school commitment to the future of the planet and 100% said it was important to involve sustainability and ecological issues in the school curriculum. About the environmental problems they want their students to be more aware of, the results show water wastage (69.6%), global warming (65.2%) and air pollution (52.2%). 78.3% considered it extremely important to carry out a project on sustainability with their students. 95.7% know what a carbon footprint is and 52.2% have helped their students calculate it. 100% believe that taking part in sustainability projects at school can change their daily routines.

5. Conclusion

This paper is the result of a study carried out within the scope of an ERASMUS+ project that involved several countries with different realities about sustainability. The "Make it Greener" project aims to change behaviours and mentalities through different activities developed in different countries to achieve sustainable and environmentally friendly development. To this end, questionnaires were applied at the beginning and end of the project to pre-defined and constant groups of students and teachers to assess more objectively whether the activities of consolidation of more sustainable behaviours were effective. Concerning the group of teachers, a hypothesis was put forward that was disaggregated into three more specific hypotheses.

Concerning the H1.1. Teachers consider the school's role in the commitment to the future of the planet to be fundamental. This is validated in the analyzed sample. In both questionnaires applied, at the beginning and end of the project, the entire sample of teachers agreed with the need to continuously update environmental protection and sustainability issues in the school curriculum to shape students' behaviours regarding these subjects.

H1.2. Teachers consider it essential to include sustainability and green issues in the school curriculum. Not verified. The assessment of the need to create a school commitment to the future of the planet decreased after the project developed (it decreased from 82.6% to 78.3%). However, regarding the importance of having a European project on sustainability and its impact on schools, the percentage that rated it as extremely important increased (from 56.5% to 60.9%) as illustrated in Figure 1.

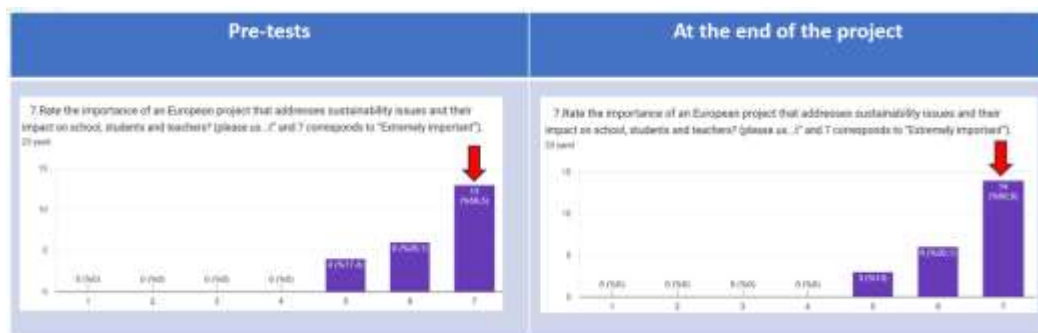


Figure 1. Importance of European projects related to sustainability and impact on schools, students and teachers (source: personal elaboration, based on questionnaire results)

H1.3. Teachers are aware of the school's role in implementing sustainability projects and change their behaviour with these projects. That is not the case. There was a decrease in teachers' perception of school resources to implement a project on sustainability (from 91.3% to 87%).

Thus, we can consider that the hypothesis defined concerning teachers is validated and teachers play an essential role in raising students' awareness of environmental issues. The various questions posed in the questionnaire reinforce the fundamental role of the school in alerting to sustainability issues. The teachers refer in a consolidated way to the importance of the school in getting involved in sustainability projects as a tool for changing behaviours, both theirs and the students.

On the other hand, students are the focus of the study being the key actors in changing behavior in environmental issues. Regarding the hypotheses put forward for this specific group, we can evaluate them as follows:

H2.1. Students are aware of the importance of sustainability issues. This hypothesis is validated by the sample. Regarding sustainability being a concern for students, there was an increase in the percentage from 91.9% to 96.8% (Figure 2), constituting an awareness of this group through practices developed in an educational environment, reinforcing the role of the school as an element of social and environmental awareness.



Figure 2. Students' awareness about sustainability issues importance before and after the project (Source: personal elaboration based on questionnaires)

H2.2. Students change their behaviour in response to sustainability projects implemented at school. Students' assessment of the school's ability to develop sustainability projects also improved from 77.4% to 83.9%, and the percentage of students who consider it extremely important to carry out a sustainability project at school increased (from 37.1% to 62.9%). In the same sense of strengthening and effectiveness of these projects, it happens about the evaluation of the extreme importance of a European project on sustainability issues and its impact on the school (from 27.4% to 48.4%) and the need to create a commitment of the school to the future of the planet (from 30.6% to 58.1%). This assumption is also valid.

H2. Students are increasingly alert to environmental issues, and there is a new generation with greater awareness of these issues. From the different results obtained in the questionnaires, before and after the project, there was a positive change in the evaluation made by the students. All indicators analysed in the students' group show improvements in results. However, the impacts of this project are more limited to the change in students' daily behaviours (from 80.6% to 82.3%), and the student's evaluation of the three main environmental problems remains unchanged: global warming, air pollution and water waste. Thus, the general hypothesis defined for the group of students is verified.

In conclusion, it is emphasized that the project has a real and effective impact on students, being an essential way to change behaviours in the school environment. Many students had the opportunity to work on sustainability issues, which made them more aware of the sustainable development goals and recognized the importance of such projects in schools. The increase in the percentage of pupils who consider it "extremely important" to carry out a project on sustainability at school showed that they recognize the impact of this type of project. In addition, the results showed that students believe that being part of a sustainability project at school will change some of their daily routines. This alternative is highly effective in changing behaviours in a sustained way and can be extended to other social and behavioural areas.

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