EcoDigital: teachers' familiarization with the environmental consequences of the use of digital technologies

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Línea temática:

☐1. Transformación del proceso educativo mediante tecnología digital
☐2. Paisajes digitales de aprendizaje
☐3. Gestión transformadora de la educación y tecnologías

Keywords: digital technologies, digital skills, digital carbon footprint, teacher training

ABSTRACT

In today's digital world, our digital carbon footprint has increased, negatively impacting the environment. This paper presents the preliminary results of the Erasmus+ KA2 project ECODIGITAL-Taking action for reducing the environmental impact of digitalization. The aim of this work is to map teachers' familiarization with the environmental consequences of the use of digital technologies and collect best practices to raise awareness in the school classroom. To achieve this, surveys and focus groups were carried out to study whether teachers in the partner countries (Iceland, Greece, Cyprus, Netherlands, and Romania) know that the way they use digital technologies may have consequences the environment. The preliminary results from the surveys and focus groups suggest that teachers are not familiar with the environmental consequences of digitalization. However, despite their lack of familiarization, teachers provide useful teaching practices for introducing the environmental impact of digitalization in the primary school classroom. Based on the findings of this study, teacher training resources and educational material for classroom implementation will be developed in the following stages of the project, providing both teachers and students with green competences and digital skills that will help them reduce their digital carbon footprint and adopt sustainable digital habits.

1. INTRODUCTION

Our presence in the digital world is growing, increasing this way our digital carbon footprint. Our digital carbon footprint is amplified when using digital devices and the cloud as this wastes a lot of electricity (Harris, 2021). In fact, the data centers' electricity consumption accounts for 1% of the global energy demand (Masanet et al., 2020), that is more than the national energy

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consumption of many countries. Recent studies demonstrate that in 2030 the internet network will consume 20% of the world's total energy (Andrae, 2020). Apart from the electricity consumption, the process of manufacturing digital devices, intensifies our digital carbon footprint with the mining and transportation of minerals, and the disposal of the digital devices (Harris, 2021). Given all the above, the EcoDigital Erasmus+ project aims to raise awareness among the educational community on our digital carbon footprint and equip students and teachers with green and digital skills that will empower them to make a sustainable use of digital technologies, reducing their impact on the environment.

In more detail, the Erasmus+ KA2 project ECODIGITAL- Taking action for reducing the environmental impact of digitalization [Project number: 2022-1-IS01-KA220-SCH-000086751] was launched in November 2022 and will last 2 years and a half, involving 6 institutions; a university (University of Iceland), 2 schools (Centrul Judetean de Excelenta Galati in Romania and the Big Bang School in Greece) and 3 organizations with different expertise (Stimmuli for Social Change in Greece, CSI- Center for Social Innovation in Cyprus, and SkillsUp Training and Research Services in the Netherlands).

The project will address important gaps in students' and teachers' knowledge regarding e-waste management, electricity consumption, storage of massive amount of data in server farms, etc. and their green and digital skills' development. Through the project, teachers will receive training in introducing the environmental consequences of the use of digital technologies in their classroom settings. They will receive ready-made lesson plans and will have the opportunity to test the activities at their school with their students. This paper focuses on the present of the preliminary results related to teachers' familiarization with the environmental consequences of the use of digital technologies.

2. METHOD

To map teachers' familiarization with environmental consequences of the use of digital technologies, surveys were sent out to teachers and focus groups were conducted in the partner countries (Iceland, Greece, Cyprus, Netherlands, and Romania). When it comes to the surveys, a questionnaire was codesigned by the project coordinator and project partners in English and then it was translated in partner languages. The questionnaire targets primary and/or secondary school teachers and consists of 19 questions (both open and closed-ended questions). The questions collected information on teachers' background (age, type of school, country), green habits (recycling, energy consumption, etc.), their familiarization with the environmental impact of digitalization, their willingness to learn more about this topic, and introduce it in the school classroom to raise awareness among students, bring positive changes in their digital habits and enhance their digital skills. To study teachers' familiarization with the environmental impact of digitalization in depth, semi-structured focus groups were conducted in each partner country. The project coordinator and project partners co-designed a series of questions and invited around 6 teachers to participate in each country. The topics discussed in the focus groups concerned teachers' familiarization with the environmental impact of digitalization and the conversation yielded a lot of interesting teaching ideas to introduce the digital carbon footprint at school and improve students' digital and green skills.

3. RESULTS

Extensive analysis is currently underway on the outcomes obtained from the surveys and focus groups that took place in each country. The findings are being meticulously examined and a comparative analysis is currently being conducted. Presented below are a few initial insights from this ongoing study:

- Teachers are familiar with major current environmental issues including climate change, pollution, global warming, environmental degradation, and resource depletion and express a genuine concern over the negative effects of human activity on the environment. However, most teachers admit that they are not familiar with the environmental impact of digitalization and have not addressed this issue in their classroom teaching.
- Teachers express their willingness to discuss the digital carbon footprint in their classroom and make efforts to enhance their students' digital and green skills. However, they point out that that they need training and guidance to achieve this.
- Teachers propose a variety of teaching methodologies and activities to introduce a discussion in the digital carbon footprint in the school classroom and bring positive changes in students' behavior and skills when using digital technologies. These methodologies and activities include experiential learning and children-led research activities in primary school.

4. REFERENCES

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