The impact of digital transformation:
From traditional education to smart education

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Abstract

European Union's focus on a green and digital transition, but how is this being implemented in local communities in disadvantaged areas of Romania? A major priority that requires our particular attention is the digitization of education. Through the National Plan for Recovery and Resilience, schools in deprived areas of Romania can apply for projects aimed at improving the quality of learning and enabling digital transformation. Using a concrete example, this paper aims to highlight the real impact such projects have on pupils and how a smart school enhances the learning process. Education plays a crucial role in the development of society, which is why we must pay more attention to it. Building on existing research that has focused on the digitalization of learning processes, this study contextualizes the findings within the field of education, addressing digital disparities and systemic issues specific to rural schools. The aim of this paper is to emphasize both the importance of the digital transformation of education in schools and the role this modernization plays. The main objectives of the paper include analyzing the significance of digital skills training for students and teachers to ensure the effective integration of technology into the educational process, and highlighting the contribution of technology to the modernization of education. It is essential to recognize the importance of education in our lives, and this paper underscores how technological modernization, especially in primary education, is being implemented in schools in rural areas.

Keywords: education, digital skills, technological challenges, modernization of the learning process.

Introduction

It is essential to understand that education is the basis of our development as individuals, but also as a society. Looking from this perspective, we must focus on improving the quality of education that we pass on. This paper aims to bring to the forefront the need to develop the educational process for young people in Romania, especially for those in rural areas. A smart school is characterized by advanced technology, digital infrastructure, pedagogical innovation, accessibility, features that lead to the improvement of the learning process [1]. Even if this ideal supports teachers and students, we must also consider the challenges encountered in order to obtain this smart school status. In Romania, primary, secondary and vocational education recorded the largest decreases in the number of students enrolled in the 2023-2024 school year compared to the previous year, with a reduction of -9.5 thousand and -4.2 thousand, respectively [2]. The purpose of this paper is to highlight the challenges faced by teachers in the process of digitalizing education and to emphasize the importance of digital transformation in schools, as well as its impact on the modernization of the educational process.

Conceptual background

We live in times when technology is a key point in our lives and helps us to evolve and enjoy various facilities every day. Also, education is currently approached in close connection with the challenges of the contemporary world, which is characterized by

significant transformations in all areas of life [3]. For this reason, it is important to evolve and offer a more modern and qualitative educational process that prepares future responsible citizens. The European Union has an active and important role in improving everything that education means. Over time, the European Union has shown interest in this direction and has implemented programs dedicated to the education and training of young people. It argues that education and training have an essential role in a knowledge-based economy, as do youth and sports policies, contributing to recovery, economic growth and employment by stimulating the development of a flexible and highly qualified population [4]. The European Union's involvement in education in the Member States is based on Articles 165 and 166 of the Treaty on the Functioning of the European Union. According to Article 165: "The Union shall contribute to the development of quality education by encouraging cooperation between Member States and, if necessary, by supporting and supplementing their action, while fully respecting the responsibility of the Member States for the content of teaching and the organisation of education systems and their cultural and linguistic diversity." [5] Important programmes implemented by the European Union in this regard are Erasmus+ and the European Solidarity Corps. The European Education Area also plays an important role when discussing digital education. The vision of the European Education Area states that by 2025, all citizens should have access to quality education and training in a truly unified European learning area. Learners and teachers should be able to easily migrate between different education systems in Member States, and lifelong learning should become the norm [4]. The European Union is focusing on a green and digital transition, and this is also felt in the field of education. Thus, digital education is an important area for development in the coming years. In this context, the Digital Education Action Plan (2021-2027) was developed. With the challenges brought to education by the pandemic situation generated by COVID-19, this plan was adopted on 30 September 2020 to respond to the educational crisis brought about by the pandemic. Learning disparities affect global economies more than economic crises, and reducing these differences would boost overall economic growth and shorten recovery periods after crises [6]. This European policy initiative establishes a common vision on high-quality, inclusive and accessible digital education in Europe and proposes to support the adaptation of the education and training systems of the Member States to the digital age. Without a doubt, this European initiative has been a model and a point of inspiration for Member States that have started the process of digitalization in education. In Romania, the digitalization of the education system has become a priority since 2016, with the launch of the national project "Educated Romania" by the Presidential Administration. The development of digital skills must be a priority for both teachers and students, in order to facilitate access to and use of innovative online resources. This approach supports the replacement of activities previously carried out in physical format with efficient digital solutions [7]. When it comes to Romania, it is certainly important to mention the Strategy for the Digitalization of Education in Romania 2021-2027, which aligns with the objectives of the European Union's Digital Education Action Plan. According to this strategy, a SMART school is a Modern, Accessible school, based on digital Resources and Technologies [8]. These are the pillars that underlie the transformation of the educational process into a modern and intelligent one. This strategy proposes to develop a flexible, digitalized, adaptable and quality education system, which will lead to the formation of active citizens, well integrated in

the labor market, capable of contributing to sustainable economic growth, and the education system to reach functional predictability [9]. Starting from this strategy, Romania is aware of the importance of digitalization in the educational field and benefits from various programs/projects that help educational institutions reach an adequate level of digitalization. An important program that finances such efforts is the National Recovery and Resilience Plan. Romania's Recovery and Resilience Plan is a strategic document that establishes the investment priorities and reforms necessary for recovery and sustainable growth, correlated with the green and digital transition envisaged by the European Commission [10].
 It is based on 6 main pillars:
1. Green Transition
2. Digital Transformation
3. Smart, Sustainable and Inclusive Growth
4. Social and Territorial Cohesion
5. Economic, Social and Institutional Health and Resilience
6. Policies for the New Generation
What is interesting to note is how, by focusing on one pillar or fulfilling it to a large extent, results can also be achieved in the area of another pillar. For example, digital transformation can be closely linked to the green transition, the two can complement each other. That is why it is interesting to analyze the importance and results of such initiatives.

Challenges in developing smart schools

It is already a certainty that economic, social and human development cannot be achieved without quality education, which represents an important pillar in the development of society. Education should not be seen as an "unproductive sector", but, on the contrary, as an essential engine of progress [6]. Once a school benefits from the funding of such a program, digital changes occur on it. The school is modernized with state-of-the-art digital equipment, which helps facilitate the learning process. Such digital equipment can include interactive whiteboards, laptops, scanners, printers, etc. The European Commission states that: "Digital education aims to enable students to thrive in life, become engaged citizens and better integrate into the labor market in an increasingly digitalized world" [11]. This statement highlights once again the importance of digitalization in the lives of young people. In Romania, there are 11,575 schools in rural areas and 6,616 schools in urban areas, which shows that the number of educational units in rural areas is higher than in urban areas [12]. Also, the 2022 PISA national report shows the perception of school principals regarding digital resources. School principals were asked about the extent to which their schools' ability to provide optimal learning experiences is affected by the lack of digital resources, such as computers, internet access, learning management systems or school learning platforms, as well as by inadequate or poor quality digital resources [13]. According to the data provided by them, over a quarter of Romanian students studied in schools where principals consider that the teaching-learning process is affected by the lack of digital resources or their quality. Even though we currently enjoy projects that bring funding for digitalization, we still need to find solutions to the challenges involved in digital development in schools. Such challenges may include: the lack of a good internet connection, which can hinder the use

of smart tools; the reluctance and poor training of teachers in the use of digital tools, the allocation of insufficient time for their training and the lack of verification of the use of these tools.

From traditional education to smart education

Given that education is an essential pillar in the development of a society, it is crucial to prioritize its development and modernization in order to form active and well-prepared citizens. Technology plays an important role in facilitating the teaching process, digitalization being beneficial both for teachers and for the way in which they carry out their activities. The experiment applied comes from observing the degree of use of smart tools in an educational institution in rural areas in southeastern Romania. Thanks to funding obtained through the PNRR program, each classroom was equipped with a smart board, a laptop, an audio speaker, a printer, a webcam and a scanner. These tools certainly facilitate the learning process and support teachers in carrying out interesting and captivating educational activities for students. Thanks to them, digital textbooks, applications with educational and interactive games, images, videos and many other digital resources can be used to help carry out teaching activities. Following discussions with teachers in this educational institution, we observed their reluctance to use smart boards. Teachers with over 10 years of experience in education claim to use smart boards once or twice a week, while novice teachers or teachers with up to 10 years of experience in the field use these boards more often.

Research Questions and Challenges

This paper aims to highlight the importance of technology in schools, the benefits of digitalization on education, but also the challenges faced by teachers in using it. First of all, if we take the first step in the digital transformation process in a school, namely the acquisition and possession of modern technology tools, we must also pay attention to the training of teachers in terms of mastering their use. In 2021, Romania ranks last in the European Union in terms of digital skills for people aged 16 to 74, with only 28%, well below the European average of 54% [14].Even though there are programs that include meetings to improve digital pedagogy, these are not practical sessions, and thus difficulties may arise in the effective use of technologies. These tools come to the aid of teachers and, in this way, the information transmitted can be consolidated much more easily. For example, when students are presented with information that can also be supported by visual representations, they will retain the information much better than if it were transmitted only verbally. Thus, when asked the question "What is an apple?", the teacher can show directly on the smart board what it looks like, rather than just describing it verbally.

Purpose, objectives, target group and solutions to challenges

This paper had as its target group the teachers/teachers/educators of a rural educational unit in Romania in order to understand how they see the importance of digitalization and what measures they can take to improve teaching activities through the help of technology. As I mentioned earlier, the main challenges faced with digitalization during classes are poor internet connection, poor acquisition of digital skills by teachers, and little time devoted to training sessions on the use of purchased equipment.

Research methods

Regarding the research methods used, this paper focused on qualitative methods. Interviews were conducted with teachers, in which questions such as: "How often do you use the equipment in the classroom?", "Do you have experience with such devices?", "How present is technology in your life?" and "What experiences have you had with these devices when you have used them?" were asked. As previously mentioned, the answers obtained revealed that young teachers, who use technology much more frequently in their daily lives, do not encounter difficulties in integrating it into their lessons. In contrast, teachers without technological experience prefer to use these tools less. On the other hand, a smart board has many functions that can contribute to improving the learning process, but not all of them are intuitive. Thus, often the use of such a board is limited to the experience of a traditional board, where you only write. The work was also based on observing how technology improves the learning process. As a teacher, I was able to observe how students perceive information transmitted with the help of technology. The digitization of classes primarily contributes to capturing attention, improves interactivity in lessons and facilitates the implementation of interdisciplinary activities.

Conclusions

On this topic, there are certainly many analyses and studies that can be carried out to highlight the importance of digitalization in schools and the ways in which we can bring technology closer to both teachers and students. I believe that it is necessary to carry out such studies to highlight the importance and results of digitalization in education. They can open multiple paths for improving this process and for creating a modern educational system. It is also essential to understand the sources of teachers' reluctance to use technology and to identify methods by which we can overcome these obstacles. Even though projects that provide funding to support the digitalization of education are extremely important and bring considerable benefits to schools, it would be useful to have forms of monitoring their implementation. Starting from the premise that the digitalization of education is crucial for the modernization of the learning process, through this paper I wanted to highlight both the challenges encountered and the achievements of the programs designed to achieve these objectives.

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