CULTIVATING ENTREPRENEURIAL MINDSETS AND DIGITAL SKILLS IN PRIMARY EDUCATION: THE DIGITALIS PROJECT

Kalliopi-Evangelia Stavroulia and Kalia Demetriadou
Kalys Solutions
CYPRUS

Abstract

The DIGITALIS project has the vision to promote the cultivation of digital skills and entrepreneurial mindsets from a young age, focusing on primary education students. The project responds to the need for shaping the future generations of people who can think outside the box, which is the key to the innovative solution to many global problems and challenges. Targeting the cultivation of entrepreneurial mindsets and digital skills, the DIGITALIS project adopts innovative teaching and learning methodologies and technology-based training approaches. The proposed methodology will be a three-fold model combining classroom teaching and learning strategies, an educational game, and outside-of-the-classroom business experiences. The project addresses equally the two main target groups of every educational system, namely, students and teachers. Through the projects' methodological framework, primary education students will enhance key competences including creativity, innovation, teamwork, collaboration, problem-solving, and critical thinking. Additionally, DIGITALIS aims to actively involve teachers during the project's activities, aiming to empower their digital skills and equip them with modern and alternative technology-based tools that can support them in providing students with more engaging and motivating learning experiences, while achieving specific learning outcomes.

Introduction

The coronavirus pandemic situation (COVID-19) impacted education and affected all students regardless of the level of education, nationality, income, or gender. COVID-19 overcame national borders and highlighted the lack of digital skills and the urgent need for the digital transformation and modernization of educational systems globally. Global educational institutions' lockdowns affected the regular delivery of education, leading to online education and virtual schooling that posed new challenges to educators and students while highlighting the lack of digital skills. This crisis resulted in tremendous learning losses for all levels of education that could extend beyond this generation, which could result in high percentages of dropout rates in coming years. The current COVID-19 crisis and its impact on education are far from over and the possibility of future unknown crises makes the need for reflection on the way educational systems work more imperative than ever.

There is an urgent need for a quick response supporting the modernization and digital transformation of education.

Equally important is that this situation revealed that innovation, smart ideas, adaptability, and responsiveness are skills that are necessary to survive at personal and workplace levels. In a constantly changing global society and workplace, the skills needed for a sustainable and prosperous future go beyond numeracy and literacy. Creativity, innovation, teamwork, collaboration, problem-solving, and critical thinking are key competences of the 21st century that can foster employability and socio-educational, personal, and professional development (Binkley et al., 2012; Van Laar et al., 2017; Voogt & Roblin, 2012). Moreover, these skills have been identified as strategic for the smart economic and social development of every nation-state. Additionally, due to the rapid technological advancements that are becoming more and more embedded in our everyday lives, there is a need to cultivate digital skills and thinking outside the box for young people. Both of the above-mentioned set of skills (digital and entrepreneurial) should be addressed from an early age, and primary education should go a step further and incorporate innovative teaching and learning practices.

In this context, the DIGITALIS project aims to address these sets of skills by using technology-based approaches and pedagogies that address the needs of primary education. Specifically, a novel educational game will be developed aiming to empower key skills for young students, who will become the next generation of innovators in tomorrow's digital era. The aim and challenge of the project are not just to adapt the training provided to the digital era and connect it with new technologies, but to build a holistic approach to promote gradual professional development as learners progress in the educational system starting from the primary level. It is highly important to enhance digitally young people and future workers, through training that meets the needs of the labour market and at the same time encourages the development of the sense of initiative and innovation that could be the key to unemployment solutions in the future. The proposed educational game will be a novel tool for unique, motivating, and engaging teaching, learning, and training experiences for primary education students that will act as a driver for change towards the integration of technology-based approaches from primary educators to enhance life-skills, digital skills, and entrepreneurial mindsets. Additionally, the DIGITALIS project aims to empower teachers' digital skills and equip them with innovative digital tools for implementing novel practices in today's digital classrooms. Teachers lack confidence in using technology in the classroom, although they acknowledge that technology can provide highly motivating and engaging experiences for the students (Finger et al., 2010; Organisation for Economic Co-operation and Development [OECD], 2019; Winter et al., 2021). Hence, primary education teachers constitute a critical target group for the DIGITALIS project. They will actively be involved, co-designing with the

Partnership the digital tools to be used and transfer the knowledge gained to primary education students.

The Significance of Cultivating Entrepreneurial Mindsets at a Young Age

Lately, the cultivation of entrepreneurial mindsets has become a significant objective within the European Agenda. The Commission of the European Communities highlighted the importance of entrepreneurship education in its "Green Paper: Entrepreneurship in Europe" (2003), while the sense of initiative and entrepreneurship are considered to be among the most important competences for future generations. According to the European Education and Culture Executive Agency Eurydice report (2017), entrepreneurial education and culture is the key to shape future generations of innovators, by providing young people the necessary skills and knowledge that will lead to business innovation. People are not born entrepreneurs, but they become successful entrepreneurs by empowering their knowledge, skills, and entrepreneurial culture. Despite the significant value of entrepreneurial education, the Eurydice report states low levels of practical entrepreneurial learning at school. The DIGITALIS project aims to close this gap and proposes a novel pedagogical framework that aims to connect primary education and the business world. The project's activities aim to bridge the gap and disconnection between primary education and the business sector, providing teachers with the necessary guidelines.

The project will provide to the students core practical activities that will promote the establishment of strong communication channels between primary education settings and businesses, inspiring the students to think innovatively and outside the box. Equally important is that this activity has the objective to familiarize primary students with the terms of entrepreneurship and green businesses and jobs while enhancing skills like critical thinking, innovation, and out-of-the-box thinking. This will be achieved through experiential entrepreneurship learning, based on bringing primary education students in touch with successful entrepreneurs, who could act as role models, inspiring the students and improving their attitudes towards entrepreneurship. The novelty of the proposed activities lies in the active involvement of entrepreneurs. They will visit online classrooms, providing the students the opportunity to experience several success stories, pose questions, and discuss their ideas. In addition, they will also help students look at the world from a different perspective, explore new ideas and possibilities, look beyond the obvious, and think out-of-the-box. Through this highly interactive activity, the students will encounter real-life conditions and experiences, helping them actively conquer knowledge, understand the role of business, and connect the business sector with sustainable development goals.

Digital Education in Cyprus

COVID-19 created an unprecedented situation and forced countries to declare a state of emergency, resulting in schools closing globally. Teachers and students came face to face with new challenges as the delivery of education became digital. This situation revealed several problems and deficiencies in digital skills and equipment in Cyprus. The proportion of Cypriot schools with a high provision of digital equipment (laptops, desktop computers, cameras, whiteboards) per number of students and a high broadband speed is lower than the EU average at both primary and secondary levels (European Commission, 2019). The Cypriot Primary Education emphasizes utilizing modern technological achievements and integration of ICT in the curricula of Primary schools. The modernization and digital transformation of primary education focus on three main pillars:

- ➢ The development of modern and ICT-based material and technical infrastructure in all classrooms of schools;
- ➢ The continuous training of teachers in the use of ICT-based teaching and learning approaches;
- ➢ The modernization of the curricula.

Efforts are made towards all three pillars, yet digital education is among the greatest challenges that the Cypriot educational system faces in primary and secondary education (European Commission, 2019). Even though Cyprus invests in technological equipment and teachers feel confident and well prepared to deliver technology-based teaching (Kyriakidou et al., 1999), there is a gap in digital skills. Several initiatives have been supported by the Ministry of Education regarding the introduction of ICT in Cypriot education, including the introduction of ICT lessons and robotics in selected schools and the donation of 250 tablets to primary and secondary education students. The course Design and Technology - Digital Technologies is recommended to be taught at the last two classes of primary education and the purpose of the course is to enable the involvement of students in a creative and innovative process through which they will acquire the necessary knowledge, skills, and attitudes to meet different needs and to solve various problems of the human environment. The course also provides students with opportunities to develop skills and attitudes that are necessary for the modern society of the 21st century. Furthermore, to boost the integration of ICT in primary education, some educational software and tools have been purchased, including Kidspiration, Kar2ouche-Creative Writing, Gennadios Encyclopedia, Journey to Culture, About Cyprus, Virtual Labs Electricity, Virtual Labs Light, Focus on Climate Change, Sibelius, and Arc View.

The implementation of ICT-based teaching and learning is a major challenge in Cyprus and future actions should be planned to fill in the gap in digital education. Supporting teachers and enhancing their digital skills and competences and their

confidence in using technology-based tools in the classroom could be the first step towards this approach. Moreover, it is essential to implement ICT lessons in all primary education schools, starting from a young age to familiarize the students with the fundamentals of computing. In this context, the DIGITALIS project aims to promote the development of key competences via a digitally based framework and through game-based learning approaches, supporting teachers in the integration of technology-based approaches in today's dynamic and digital classrooms.

The DIGITALIS Project

The DIGITALIS project has the vision to promote the cultivation of digital skills and entrepreneurial mindsets from a young age, focusing on primary education students. By providing a novel pedagogical and methodological framework empowered with new and innovative technology-based approaches and particularly educational gaming, the project will address the cultivation of key 21st-century competences including creativity, innovation, teamwork, collaboration, problem-solving, and critical thinking for young students. DIGITALIS project aims, via using a combination of in-class assignments and a game-based learning tool, to provide young students, aged 8-12 years old, a unique learning experience that will form the basis for outside-of-the-box thinking that can result in future innovative initiatives. Addressing the cultivation of entrepreneurial mindsets from a young age is also considered to be critical to economic growth. Now more than ever there is a need for creative people that can boost the global economy with creative ideas and initiatives. After all, the global pandemic situation constrains the business world to shift to digital to ensure its survival.

Equally important for the DIGITALIS project is the empowerment of teachers' digital skills. Teachers are the key actors of every educational system, shaping the future generations of citizens. School closure due to COVID-19 forced them to go online, posing a great challenge for those with low digital skills that must support hundreds of students. Moreover, the possibility of a future pandemic outbreak that could lead once more to possible lockdown measures highlights the significance of addressing the lack of digital skills of teachers. In this context, the project aims to enhance teacher's digital skills and also equip them with new innovative and digital teaching methods and tools to support digital native students and dynamic, diverse, and digital classrooms.

The DIGITALIS project is dedicated to primary education starting from the preparation of young students for the world of work, where digital literacy is essential. The innovation of the project stems from the learning methodology that will combine in-class assignments with game-based learning techniques aiming to foster the development of a range of digital competences and also the cultivation of entrepreneurial mindsets. Combining theoretical and practical training will allow

the students to connect theory and practice and conquer knowledge. The methodological framework of the project will offer both teachers and students high-quality training and will be implemented in five different European countries: Greece, Cyprus, France, Romania, and Spain.

The Aims of the Project

Primary education is the first step on an educational journey towards the acquisition of knowledge and skills that can guarantee a sustainable future for today's students. According to The European Commission's European Digital Progress Report of 2017, 90% of all today's jobs require at least some level of digital skills, while in its *White Paper on the Future of Europe* (2017), the European Commission highlighted that today's primary school students will more likely end up working in new job types that do not yet exist. In addition, the European Education and Culture Executive Agency, Eurydice's report "Digital Education at School in Europe" (2019) indicates that digital competences are not explicitly addressed in the national curriculum by the Member States, particularly for primary education. Moreover, in several Member States, digital competences are addressed as a separate subject and not as a cross-curricular theme.

In the face of an increasingly uncertain, complex, and changing world that is facing challenges without precedent, there is a need for people not only to be equipped with digital skills but also to raise children who can think out-of-the-box, innovate, turn ideas into action, and be able to adapt easily to changes. Consequently, it is vital to start cultivating a sense of initiative and entrepreneurial mindset, from a young age, as children are born imaginative, energetic, and willing to take risks. Moreover, it is essential to cultivate an entrepreneurial mindset as it can promote competitiveness, innovation, and creativity. Early cultivating of such a mindset is considered to be critical to economic growth and prosperity as not only it will contribute to new innovative business ideas but at the same time, it will contribute to a generation of people that will be competitive, solve challenging problems, think critically, turn ideas into action, and adapt to any change. However, despite the benefits of cultivating entrepreneurial skills, over half of the EU member states are only in the initial stages of embedding it into their national educational systems and have few or no guidelines of entrepreneurial learning, while there is no instruction for the teaching staff for this thematic area.

In light of the above challenges, the DIGITALIS project has as a main objective to empower the acquisition of digital skills and the cultivation of thinking-out-of-the-box mindset to the target group of primary education students aged 8-12. At the same time, the project aims to equip teachers with innovative technology-based tools and knowledge that can be taught in the classroom and support the acquisition of key competences, including digital skills and entrepreneurial mindsets between

the students. DIGITALIS project has the vision to develop from scratch and implement a novel educational game as part of the training methodology, to give the students-players real agency over the challenges and learning objective they are trying to master. The game will present real-life challenges that need to be solved through understanding and experimentation within a safe environment. These challenges will be novel to the students, offering access to experiences that would otherwise be impossible to accomplish in the classroom. The educational game will provide primary education students with a unique and highly motivating and engaging training experience that will boost the cultivation of core competences. The scenarios of the educational game will reflect real-life problems and challenges, promoting the development of a range of competences, including innovation, creativity, critical thinking, problem-solving, teamwork, and digital skills.

The impact of the DIGITALIS project is of paramount importance for both students and teachers. For the students, the vision of the project is to promote the personal and professional development of core life competences and skills along with the cultivation of entrepreneurial mindsets. For the teachers, the importance of the project lies in equipping them with new teaching and learning methodological framework enhanced with an innovative game designed to further support their efforts to equip young students with key competences.

The Target Audience

The DIGITALIS project targets two main groups:
- *Students aged 8 to 12 years old*. Through the dedicated project activities, this target group will acquire core digital competences and skills through the use of innovative teaching and learning methods and game-based training tools. These skills are the starting point for a successful professional career and the best protection against unemployment and poverty. The students involved in the project are expected to acquire key life skills, including creativity, innovation, teamwork, collaboration, problem-solving, critical thinking, decision making. Additionally, the students are expected to cultivate entrepreneurial mindsets, a sense of initiative, and out-of-the-box creating thinking that could lead to future innovative business and professional attitudes.
- *Primary education teachers*. Teachers are the key wheel for achieving the digital transformation and modernization of education. Additionally, they need digital skills empowerment to respond to the needs of digital native students. Through the projects' activities, primary education teachers will be equipped with modern and innovative tools and good practices to be integrated into the curriculum. The teachers that will be trained through the project's activities will act as ambassadors and will implement the
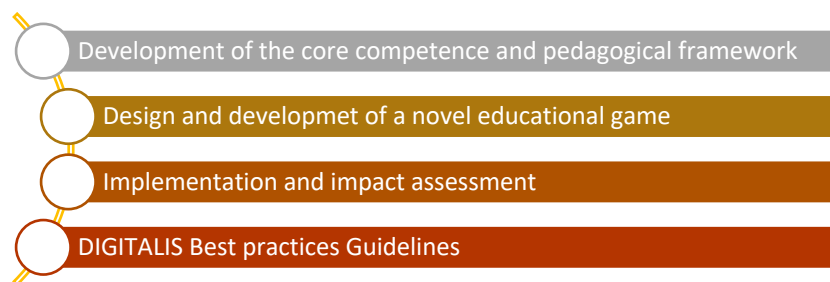
methodology and tools of the project in their classroom. In the long run, their active participation aims to foster future initiatives using the methodological framework and tools of the project ensuring also its sustainability.

The Methodological Framework

The main activities of the DIGITALIS project are presented in Figure 1.

Figure 1
Main activities of the DIGITALIS project

Development of the core competence and pedagogical framework

Design and developmet of a novel educational game

Implementation and impact assessment

DIGITALIS Best practices Guidelines

The project activities begin with the development of the core competence and pedagogical framework dedicated to primary education students aged 8-12. An analysis of the existing competence models and collaboration with teachers will lead to the identification of the key competence and basic skills model that will be in line with the age of primary education students. The identification of the competence model will contribute to the development of the pedagogical framework and the training methodology to be used that combines in-class activities, enriched with experiential learning strategies (educational gaming) and online visits from entrepreneurs. The identification of the competence and pedagogical framework will lead to the development of a dedicated educational game promoting game-based learning experiences to primary education students. The in-class activities along with the educational game to be implemented will be assessed and evaluated, providing significant feedback about the impact of projects' activities on students and teachers. The final activity of the project deals with the development of the best practices guidelines of the DIGITALIS Project, which will summarize the experience gained throughout the project, the methodology and guidelines, along with the training resources and tools developed and implemented.

Conclusions

The main aim of the DIGITALIS project is to promote the cultivation of entrepreneurial mindsets and empower digital skills for primary education students.

Equally important is that the project targets also teachers, aiming to provide them with novel technology-based tools that can be used in teaching and learning. The DIGITALIS project addresses today's urgent need for the digital transformation and modernization of education and has the vision to provide innovative digital tools for both the students and the teachers that can foster the cultivation of life skills that are essential for achieving excellence in the workplace. The proposed methodology will be a three-fold model, combining classroom teaching and learning strategies, an educational game that will be developed, and outside-of-the-classroom business experiences. The classroom activities, which will be designed with the active participation of teachers, will empower students' core competences and entrepreneurial mindsets through real-life challenges. The classroom activities will be enhanced with the novel educational game providing students the opportunity to work towards goals, choose actions, and experience the consequences of those actions along the way. Moreover, the cultivation of entrepreneurial mindsets will be promoted through the establishment of strong collaboration channels with the business sector, through actions such as online visits to schools by entrepreneurs who are willing to share their experiences to help students cultivate innovative and out-of-the-box thinking. The DIGITALIS project proposes a novel key competency training framework incorporated with game-based approaches that will be implemented in five different countries (Greece, Cyprus, France, Spain, Romania).

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Author Details

Kalliopi-Evangelia Stavroulia
Kalys Solutions
Cyprus
p.stavroulia@kalys-solutions.com

Kalia Demetriadou
Kalys Solutions
Cyprus
k.demetriadou@kalys-solutions.com