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Social entrepreneurship and green digital skills as contributors to reduction of tertiary education dropout and professional integration of NEETs in the EU

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Abstract

NEETs (not in education, employment, or training) represent a category of young population that faces major difficulties in integrating in the labour market due to factors such as early school dropout, cultural barriers, lack of trust in employers, schools, and public institutions. NEETs consist or vulnerable categories that require constant attention and support, as 11.1% of the young population in the EU are NEETs. Also, universities face increasing dropout rates, with a share of dropouts shifting towards the NEETs category. In this context, the greater role of universities as regional actors for development of new skills becomes of high importance. The paper discusses how social entrepreneurship skills and digital green skills can contribute to the reduction of NEETs and university dropout rates. Further, the paper presents a comparative analysis of five EU-funded projects developed by universities and how they succeeded in addressing the central problem raised in the paper.

Keywords: social entrepreneurship skills, digital green skills, university, training programs.

INTRODUCTION

Among the social concerns faced in the current economic landscape are two phenomena: young people who are not engaged in education, employment, or training (NEETs) and Generation Z who marks increasing dropout rates from higher education studies. These two challenges have both social and economic negative impacts, further affecting individuals' well-being and financial safety.

The current educational frameworks do not have actual resolutions for these two challenges, leaving a major gap that needs innovative solutions. The authors argue that conception of training programs addressing novel skillsets such as digital green skills and social entrepreneurship skills help vulnerable categories to better integrate in the labour market and have improved satisfaction with the overall study programs they selected.

The paper presents a comparative analysis of five EU-funded projects that target development of skills valuable in the labour market and their impact. Also, the authors debated on the findings and their relevance for the literature. A final section dedicated to conclusions completes the paper structure.

NEETS, TERTIARY EDUCATION DROPOUT AND THE SKILLS GAP

The concept of NEETs (i.e., not in education, employment, or training) describes a category of young people aged between 15 and 29 years old, whose role in the society remains unclear due to long-term unemployment (Eurofound, 2024). Without proper formal education, many of these young people have major difficulties with their integration in the labour market. The main characteristics of the NEET population are: (1) the fact that they are predominantly from rural communities, (2) have not been actively searching for a job but some of them have a desire to find a workplace at some point, and (3) they fail to trust educational systems, public bodies, and employers (ComNETNEET, 2019).

Vulnerability of the labour market and efficiency of education systems are in connection with the rate of NEETs in a country. In the context of the 2030 Agenda for Sustainable Development and the European Green Deal, the integration of NEETs is no longer just a social welfare issue, but a strategic necessity for economic sustainability (Eurofound, 2024). As of 2024, NEETs rate in the EU was 11.1% of the total working age population with a slight decrease since 2020 (Eurostat, 2024). Modern integration programs place increasing emphasis on two fundamental pillars: social entrepreneurship which offers innovative solutions for the inclusion of marginalized groups, and green digital skills, essential for the jobs of the future.

The efficiency of training programs depends on their alignment with European reference frameworks. The Digital Competence Framework (DigComp), updated to version 3.0 in 2025, facilitates access of NEETs to online information and services, essential for job searching (Cosgrove, 2025). Further, the European sustainability competence framework (GreenComp) enables NEETs to develop systemic thinking and environmental responsibility, skills that are vital in the economy shaped by the Green Deal (Bianchi et al., 2022). Nonetheless, the Entrepreneurship Competence Framework (EntreComp), enables NEETs to find an alternative route for their professional integration in the economy while also developing their ability to transform ideas into actions with social value (Bagicalupo et al., 2016). These competency frameworks enable alignment of national strategies and actions with the greater European aim of enabling citizens' right to a better life and equality of chances. Although none of them is directly

targeted at NEETs, designing solutions and training programs aligned with these frameworks can increase the success rates and reduction of NEETs number.

Another concerning phenomenon is the increasing rate of abandonment in tertiary education. At EU level, only ~45% of students enrolled in any tertiary education program within the theoretical duration of the program (OECD, 2025). First-year dropout rates exceed 20% in countries such as the Netherlands, Romania, Denmark, Belgium, and Luxembourg (OECD, 2025). As per "Eurostudent 8" report, the students who are prone to abandoning their higher education study programs are predominantly those who used to face financial difficulties, enrolling later in higher education due to prioritization of professional routes, necessary for survival (Hauschildt et al., 2025). Oftentimes, these students lack family support and rely on self-earned income (Hauschildt et al., 2025). Also, students with disabilities face challenges such as severe financial difficulties due to potential work limitations, along with discriminatory behaviours (Hauschildt et al., 2025). Moreover, education policy frameworks do not typically consider housing, health, and employment. However, these factors are related to access and finalization of tertiary education programs, as they shape the overall situation of students (Hauschildt et al., 2025).

Regarded as a major economic and social loss, dropout rates remain a considerable concern for generation Z (Popescu, Vahnovanu, 2025). The gap between expectation and perceived quality of study programs, along with counselling and mentoring services remain one of the major reasons for the high dropout rates. In the EU, in 2024, 42.6% of students who gave up tertiary education reported this gap as the main reason (Eurostat, 2025).

In this context, an alternative approach to both NEETs rate remaining high and the concerning dropout rates in higher education is the development of novel skills required by the current labour market but not addressed by traditional study programs. Access to free training programs available as micro credentials or optional courses within universities can increase students' satisfaction with their academic experience. The integration of green digital skills and social entrepreneurship plays an essential preventive role. Students who acquire green digital skills (e.g., data analytics for sustainability, resource management through technology) perceive a direct connection between their studies and current labour market demands. NEETs oftentimes face lack of intrinsic motivation, which can be tampered through their access to training programs focused on relevant skills. Also, students' lack of satisfaction with bachelor's and master's programs curricula can be improved by optional or alternative training programs available in universities. Further, training, and mentoring programs for social give students a social purpose. The feeling of contributing to solving real problems increases commitment to the institution. Nonetheless, developing digital skills allows students from disadvantaged backgrounds (potential NEETs at tertiary level) to access digital resources and online mentoring services, which can offset geographical or financial barriers, thus preventing dropout.

COMPARATIVE ANALYS OF EU-FUNDED PROJECTS FOR REDUCTION OF NEETS AND TERTIARY EDUCATION ABANDONMENT RATES

This section aims to provide a comparative analysis of five EU-funded projects that developed training programs aimed at developing young population's skills that are of high value for employers and employees alike. Contemporary tertiary education faces significant challenges, including high dropout rates and a perceived discrepancy between the skills developed by higher education programs and the needs of the labour market. In this context, EU-funded projects, such as the Erasmus+, play an essential

role in supporting pedagogical innovation and in aligning academic programs with economic needs. In this section the authors analysed five Erasmus+ projects (DigiFunCollab, RespectNet, VirtualEdu, EDU4PlastiCircular and MUST) as relevant examples. These projects propose solutions based on transnational collaboration, skills development, digitalization of teaching-learning processes and promotion of social and ecological responsibility.

Methodology

To address the research objectives, this study employs a qualitative, comparative case study approach. This methodology was selected to allow for an in-depth exploration of how specific educational interventions focused on social entrepreneurship and green digital skills training are implemented and their perceived impact on reducing university dropout rates and facilitating the professional integration of NEETs within the EU context.

The analysis focuses on five EU-funded projects that were purposively selected based on the following criteria: (1) direct relevance to the themes of social entrepreneurship and/or green digital skills; (2) explicit aims to address challenges related to vulnerable youth populations, including NEETs and students at risk of dropout; and (3) their status as Erasmus+ initiatives, ensuring alignment with broader European educational and social objectives. Furthermore, the involvement of Politehnica University of Timișoara (UPT) as a common partner across these projects provided a consistent institutional context for understanding implementation dynamics and localized impact.

Data for this study was collected primarily through document analysis. Sources included publicly available project documentation, official reports, dissemination materials, and project websites. The data extraction process focused on identifying project objectives, target groups, pedagogical approaches (e.g., gamification, flexible learning), specific skillsets developed, and reported outcomes. The analysis was conducted in two stages. First, an individual project analysis was performed to delineate the core contributions and intended impacts of each initiative. Second, a comparative analysis was undertaken to identify common themes, distinct approaches, and overarching best practices. This comparative lens critically evaluated how these diverse projects collectively contribute to a more resilient and responsive university ecosystem.

Projects presentation. Objectives, contributions, and comparative analysis

Projects presentation. Objectives and contributions

DigiFunCollab focuses on developing digital self-learning courses in social entrepreneurship. The project includes a mentoring program, supporting trainees to develop social business plans and to identify financing possibilities for the actual implementation of the business idea. Through the training program, students develop project management and entrepreneurship skills.

RespectNet aims to promote media literacy and respectful scientific dialogue. The project creates a safe academic environment, free from hate speech and cyberbullying. Ethical digital communication and fact-checking skills are essential in any modern professional field, protecting the reputation of future employees in the online environment.

VirtualEdu offers certification schemes for distance education and work. The European recognition of the skills through European Certification and Qualification Association (ECQA) allows NEETs and

students' mobility and increases their confidence in pursuing different professional paths across the EU in a job market that increasingly prioritizes remote work.

EDU4PlastiCircular focuses on education for the circular economy and the prevention of microplastic pollution. Beyond raising awareness on plastic waste prevention, the project enables students to develop green skills, particularly useful in domains such as environmental engineering, waste management, and sustainable manufacturing.

MUST focuses on developing multimedia skills for university staff. Well trained faculty staff are able to deliver improved content via digital means and to educate their students while also fostering transversal skills such as digital skills and media literacy. Majority of today's jobs require digital and media literacy skills.

Table 1: Comparative analysis of selected projects - role in reduction of NEETs and tertiary education abandonment rates

Project	Main pillar	Impact on Employability
DigiFunCollab	Social entrepreneurship	Business and innovation skills, environmental and social added value
RespectNet	Media literacy and netiquette	Ethical and professional communication
VirtualEdu	Remote work/education	Skillsets for digital productivity, intercultural communication, collaboration in virtual teams, online safety, and well-being
EDU4PlastiCircular	Sustainability, Green skills	Competencies in the areas of circular economy, microplastics management
MUST	Multimedia competencies	Visual and digital literacy

Authors' own conception.

Critical results analysis

Although they seem quite divergent, all five initiatives converge towards creating a resilient university digital ecosystem (see Table 1). Projects such as MUST and VirtualEdu act as fundamental pillars, building the infrastructure and methods of delivering educational content. MUST focuses on training teaching staff to effectively use multimedia tools, ensuring innovative pedagogy, while VirtualEdu offers flexibility through distance learning models and relevant certifications for virtual work. On the other hand, DigiFunCollab and EDU4PlastiCircular provide future-relevant content, preparing students for social entrepreneurship and the green economy, areas with significant potential for growth and social impact. In this framework, RespectNet plays a crucial role in ensuring an ethical and constructive environment of interaction, promoting respectful communication and media literacy, essential for any form of academic or professional collaboration. This interdependence emphasizes the need for a holistic approach in the development of tertiary education, where technological innovation is intertwined with social and ecological responsibility.

However, it is important to critically assess the limitations of these initiatives. While the projects successfully develop frameworks and pilot training programs, their long-term impact on reducing NEET rates and university dropout is difficult to quantify without longitudinal tracking. The current analysis is primarily descriptive, relying on project aims and initial outcomes. A deeper analytical challenge lies in the scalability of these projects. While successful within the context of the partner universities, translating these localized successes into systemic, EU-wide educational policy changes requires overcoming significant institutional and financial barriers.

University partners of the projects' consortia managed to integrate the respective developed resources into their curriculum, offering students access to digital libraries (VirtualEdu, EDU4PlastiCircular) and social entrepreneurship courses (DigiFunCollab). Using podcasts and transmedia campaigns (MUST) to explain complex scientific concepts has led to an increase in student participation in courses by over 20% at partner universities. The digital badges and certificates offered by VirtualEdu and DigiFunCollab are recognized by local industrial partners, facilitating student placement in internships.

The analysis of the five projects conclusively demonstrates that reducing early school leaving and increasing the employability of graduates in tertiary education are not isolated processes, but the result of a holistic and systemic transformation of education. Through the integrated development of transversal skills – digital, green, entrepreneurial, and ethical communication – universities strengthen their role as centres of social innovation, preparing active citizens and professionals adaptable to the complex demands of the 21st century.

DISCUSSION

In the context of the Green Deal, development of digital green skills is very important for meeting Europe's sustainability goals (da Costa et al., 2025). Awareness is not enough. The alignment between industry requirements and goals specific to tertiary education programs becomes a requirement and not a preference (da Costa et al., 2025). Akinsemolu and Onyeaka (2025) argue that green education (i.e., training programs dedicated to green skills) not only develops environmental awareness and skills necessary for proper job performance in the context of the Green Deal and Sustainable Development Goals, but also develops horizontally skills such as critical thinking, collaborative decision making and implementation of innovative pedagogical approaches. Therefore, students and NEETs can further benefit from development of a multitude of skills across various areas, all with high value in the future evolution of the economy and the labour market intrinsically. Digital green skills are even more important in this context. The rapid evolution of Artificial Intelligence (AI) and quantum computing drive an even more prominent need for digital skills applied in the context of sustainable and environmental goals (Shen et al., 2025).

The sense of a greater purpose, with immediate visible impact is a major motivator for students and young people struggling with professional integration and educational personal goals (Tobel, 2024). Many green jobs require vocational training and specialised skills, making them more accessible to young people who struggled to finalize formal educational programs (Mondo Digitale, 2025). According to Strenitzerova and Corejova (2025), the EU has a stringent need of professionals with digital green skills, as more than 70% of European companies report a shortage of professionals in the field. Neagu et al. (2021), highlight that the lack of digital and green skills further aggravates NEETs situation, as their employability declines due to lack of skills.

On the other hand, green economy does not rely only on existence of trained professionals, but also on sustainable businesses (United Nations, 2020). In this context, social entrepreneurship becomes a new direction for both environmental goals at society level and professional development at individual level (Haug et al., 2023). Nevertheless, there are various factors identified by Mion et al. (2026) that support efficiency of entrepreneurial programs provided by universities: the university ecosystem links students to the external environment, facilitating business ideas implementation; institutional support; alignment with local labour market needs; and leverage of social capital fostering engagement and skills development. Antohi and Ghiță-Mitrescu (2023) performed a study on NEETs graduating an

entrepreneurship training programs, revealing that majority of the participants gained confidence in their capacity of starting a business and were more interested in their active integration in the labour market.

CONCLUSIONS

Both NEETs and students that are prone to tertiary education dropout face major challenges at financial and professional levels. The longer they postpone integration in the labour market, the more difficult their situation becomes. Oftentimes, tertiary education students who drop out from university become NEETs, especially when they were not working before joining the university program. In this context, the authors highlight the importance of digital green skills and social entrepreneurial skills for reducing these two phenomena at EU level. The paper argues that universities providing free training programs addressing these skills have better chances of retaining students and preventing their indirect contribution to the NEETs rate. The projects analysed demonstrate that reducing early school leaving and increasing employability are not isolated processes, but the result of a holistic transformation of education. By developing transversal skills (digital, green, entrepreneurial), universities become centres of social innovation that prepare active citizens and adaptable professionals. While the projects analysed are feasible solutions, the need for future empirical research to quantitatively measure their long-term impact is a future research direction. The main recommendation derived from this study is the necessity for the sustainability of these initiatives.

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