

Start-IT: An Innovative Approach to Teaching Sustainable Entrepreneurship in Higher Education

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Abstract

This paper describes a project that took an innovative approach to teaching sustainable entrepreneurship in higher education. The project, called Start-IT, was part of a three-year European Union Erasmus+ co-funded initiative. The project was run three times: Porto, Portugal in 2022; Berlin, Germany in 2023; and Antwerp, Belgium in 2024.

This paper examines feedback provided by university students who participated in the Antwerp Start-IT project. The project included 50 students from six EU countries. Participant students were mostly from Computer Science and Business Studies undergraduate programs, though students from other disciplines were also involved in the project. The students were formed into inter-college, diverse, international, and multidisciplinary teams. These teams were assigned the task of developing a mobile app prototype, creating a business plan, and devising a marketing plan. The students were restricted to developing apps that promoted sustainability. This paper presents quantitative and qualitative feedback received from the students who participated in the Antwerp Start-IT project.

The findings in this paper show that engaging in multi-day projects that involve inter-college, diverse, international, and multidisciplinary teams can help develop university students' sustainable entrepreneurship skills.

Keywords: Sustainable Entrepreneurship, Cooperative Learning, Active Learning, Problem Based Learning.

1. Introduction

The Start-IT project is a collaborative effort among colleges from six EU countries. It aims to equip students with essential soft, future, entrepreneurial, and IT skills that are necessary in today's labor market. Through a cooperative problem-based learning approach, students work in diverse, international teams to develop real-world solutions related to sustainable entrepreneurship. The project fosters critical thinking, creativity, innovation, collaboration, self-confidence, resilience, practical understanding of business concepts, and a sense of ownership among participants.

The significance of this research lies in addressing the growing importance of entrepreneurship education, particularly in the context of sustainability. With the rapid changes in society and the increasing focus on sustainable development, it is crucial to prepare students with the skills and mindset necessary to address complex challenges and contribute positively to society. The Start-IT project aligns with UNESCO's Education for Sustainable Development

(ESD) principles and the European Commission's emphasis on entrepreneurship education across all disciplines and levels of education.

The objectives of this paper are to assess the impact of the Start-IT project on students' soft and future skills development, particularly in the context of sustainable entrepreneurship. The research seeks to answer the following questions:

- To what extent does participation in the Start-IT project enhance students' critical thinking, creativity, and innovation skills?
- How does collaboration within diverse, international teams contribute to students' soft skill development, particularly in the context of sustainable entrepreneurship?
- What is the influence of the Start-IT project on students' self-confidence, resilience, and practical understanding of business concepts?
- How does the project foster a sense of ownership and improve students' presentation skills?

By examining both quantitative and qualitative feedback from students involved in the Antwerp Start-IT Project, this research aims to provide insights into the effectiveness of cooperative problem-based learning methodologies in enhancing students' soft and future skills. The findings will contribute to the growing body of literature on entrepreneurship education and sustainable development, providing valuable suggestions for educational practices and curriculum development in higher education institutions.

2. Background

Being entrepreneurial empowers students, as it allows them to contribute to society and to be positive in their personal and professional lives. UNESCO states that Education for Sustainable Development (ESD) “*promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way*” (UNESCO, 2014). Fayolle & Gailly state “*We live in a rapidly changing society where it is essential that everyone has the capacity to act upon opportunities and ideas, to work with others, to manage dynamic careers and shape the future for the common good. To achieve these goals we need people, teams and organisations with an entrepreneurial mindset, in every aspect of life*” (Fayolle & Gailly, 2008). Other papers, such as (Fiet, 2001; Kuratko, 2005; Lackéus, 2015) also discuss the importance of teaching entrepreneurship in higher education and how the teaching of entrepreneurship prepares students for the challenges and complexities of the modern world. These papers provide insights into how entrepreneurship education equips students with versatile skills, fosters a mindset of innovation, and prepares students for the challenges of a dynamic professional environment. The European Commission’s Eurydice report states that:

“Entrepreneurship education is about learners developing the skills and mind-set to be able to turn creative ideas into entrepreneurial action. This is a key competence for all learners, supporting personal development, active citizenship, social inclusion and employability. It is relevant across the lifelong learning process, in all disciplines of learning and to all forms of education and

training (formal, non-formal and informal) which contribute to an entrepreneurial spirit or behaviour, with or without a commercial objective” (European Commission/EACEA/Eurydice, 2016).

Students who engage in course content that encourages entrepreneurial skills and capabilities while in college have an increased tendency to start their own business when they leave college (Peterman et al., 2003; Souitaris et al., 2007; Liñán & Fayolle, 2015). The European Commission’s Eurydice report states that *“an analysis carried out by the Global Entrepreneurship Monitor (GEM) shows a strong correlation between perceived entrepreneurial capabilities (skills) and the total early stage entrepreneurial activity (TEA), which indicates how important education is in developing entrepreneurial competences”* (European Commission/EACEA/Eurydice, 2016). The same report also states that *“Entrepreneurship education is essential not only to shape the mind-sets of young people but also to provide the skills, knowledge and attitudes that are central to developing an entrepreneurial culture”*.

It is important that students not only engage in entrepreneurship. They must engage in sustainable entrepreneurship. Entrepreneurs need to be aware of the impact of sustainability practices on the entrepreneurial ideas that they conceive. Entrepreneurs need to recognise their corporate social responsibility by adopting practices that contribute positively to society and the environment. The World Commission on Environment and Development’s Brundtland Report defines sustainability as *“meeting the needs of the present without compromising the ability of future generations to meet their own needs”* (World Commission on Environment and Development, 1987). Gaining sustainable entrepreneurship skills in college will impact positively on the way that students engage with sustainability if they set up a business after they leave college. This focus on sustainable development enhances the need for the promotion of educational practices that bring awareness to all these upcoming changes. With this perspective in mind, UNESCO stated that *“Education for Sustainable Development allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future”* (UNESCO, 2014). In this report, UNESCO states that Education for Sustainable Development (ESD) means *“embedding key sustainable development issues into teaching and learning. ESD must cover the four interconnected environmental, human, social and economic pillars associated with sustainability”*. The UN’s Sustainability Evaluation Tools for Higher Education Institutes states that HEI are a major driving force for sustainability because of their prominent role in shaping society (UN Academic Impact (UNAI), 2023). The report sets guidelines for the involvement of HEI in this domain. The report states that HEI should *“educate and train the future leaders and equip them with the skills and knowledge that prepare them to contribute to sustainable societies”*. HEI should also *“undertake the majority and the most innovative research in societies, creating cutting-edge knowledge and technology”*. HEI should also *“directly contribute to communities by transferring and disseminating this knowledge and technology and establishing alliances with other actors of the Quadruple Helix (governments, industry and societal groups)”*. HEI should also *“lead by example making governance, strategies and operations more ethical and sustainable”*.

Being sustainable is only useful to entrepreneurs if it makes good business sense. The switch to sustainable economies will present entrepreneurs with many opportunities. Embedding sustainability into business practices can lead to a competitive advantage. Bocken et al argue that embedding sustainability into business can serve as a key driver of competitive advantage (Bocken et al, 2014). Igarashi et al. explore the relationship between corporate sustainability and firm value, the role of sustainable entrepreneurship in business innovation, and how sustainability can drive competitive advantage (Igarashi et al, 2017). Many governments are investing huge sums of money in sustainability, providing sustainable entrepreneurs with many opportunities. The EU is spending \$1 trillion on the Green Deal (European Commission, 2019). Similarly, the US is spending over \$2.3 trillion on its American Jobs Plan (AJP), which aims to create millions of new jobs in sectors related to sustainability on the AJP. (White House, 2021). Even smaller economies are driving policy and investment toward sustainable development. For example, in the UK, The Build Back Better Business Council (BBBBC) has brought together government and business leaders to drive economic recovery and growth across the UK and to enable the transition to a Net Zero economy by 2050. The UK will invest almost \$2 billion in the BBBBC (The Build Back Better Business Council, 2021).

Sustainability goals can only be achieved with global international collaboration because the challenge is global. To achieve global sustainability, the UN created the sustainable development goals (SDG) (United Nations General Assembly, 2015). The SDG provide a global framework to address the various aspects of sustainability. They are an attempt to integrate all the different aspects required to promote sustainability globally. The SDG are based on a multidimensional understanding of development, including environmental, human, social and economic sustainability. Many governments are becoming more involved in driving policy, and funding, toward sustainable entrepreneurship. The European Green Deal is a *“growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use”*. The European Green Deal *“also aims to protect, conserve and enhance the EU's natural capital, and protect the health and well-being of citizens from environment-related risks and impacts”*. The European Green Deal *“resets the Commission’s commitment to tackling climate and environmental-related challenges that is this generation’s defining task”*.

3. The Start-IT Project

The Start-IT project involves collaboration between colleges from six EU countries (Germany, Ireland, Portugal, Belgium, Poland, and Finland). The Start-IT project commenced in February 2022, and it will run until the end of January 2025. During this three-year period, three ten-day diverse, international, and multidisciplinary projects were run. In 2022 the project was run in Porto, Portugal. In 2023 the project was run in Berlin, Germany. In 2024 it was run in Antwerp, Belgium. Running the project three times ensured widespread student participation and allowed the academics to refine the project. For each of the three Start-IT projects, each travelling partner

college sent ten students and two academic staff. For each Start-IT project, the participating universities sought to get a gender balance among the participants. Additionally, partner colleges endeavored to ensure that their student selection process favored students from disadvantaged backgrounds, as these students have had less opportunities to travel and interact with people from other countries. For the Berlin and Antwerp projects, the host college also included some of their own local students in the project. Having a local student on each team was very useful in helping the visiting students get around the workings of the host city.

The primary focus of a Start-IT project is to equip students with the soft, future, entrepreneurial, and IT skills that are essential in today's labor market. Start-IT projects use a cooperative problem-based learning methodology that focuses on the interaction and cooperation among students who are working in teams to solve real-world problems. Cooperative problem-based learning projects focus on the development of essential skills and prepare students for the collaborative and problem-solving nature of the professional world. Cooperative problem-based learning projects have become an integral component of higher education, as they offer students a unique opportunity to collaborate, share ideas, and enhance their learning experiences. Cooperative learning fosters not only content acquisition, but also collaboration skills, such as communication, conflict management, leadership, and decision-making. Problem-based learning involves deep engagement with the problem to be solved. This helps students acquire deep understanding of the topic, encourages students to be critical thinkers, fosters creativity, and helps students learn to persevere.

Start-IT projects bring together students from various disciplines, cultures, and nationalities. Student teams, of size five or six, are established on the project's first day. The teams are then given ten days to work on their mobile app, business plan, marketing plan, and presentations. When forming teams, students from each participating college are placed in different teams. This results in each member of a team having a unique combination of subject knowledge, cultural diversity, and personal experience.

Within a Start-IT project, the student teams are tasked with developing a mobile app prototype, a business plan, and a marketing plan aligned with a sustainability goal. Students on each team come from different study programmes, such as IT or business. For most students on the project, this is their first time working with students from different study programmes. This reflects the real working world. To be successful, team members must trust the various app development and business tasks to the team-members who are knowledgeable in the field. They must collaborate to ensure that the app, business plan, and marketing plan match each other. Additionally, to create and present their work, all the team members must work together to give engaging presentations.

The European Commission state that *“Real world experience, through problem-based learning and enterprise links, should be embedded across all disciplines and tailored to all levels of education. All young people should benefit from at least one practical entrepreneurial experience before leaving compulsory education”* (European Commission, 2012). Each Start-IT project involves one or more local business or governmental partners. Start-IT projects are focused

on, and are driven by, the needs of the local partner. The local partners bring domain expertise to the project. The inclusion of local partners ensures that the mobile app prototype, business plan, and marketing plan that are developed by the student teams during a Start-IT project address real-world marketplace needs, as influenced by the local partners' expertise.

The three Start-IT projects focused on sustainable entrepreneurship. The topic chosen for the projects in Porto, Berlin and Antwerp related to the host city. In Porto, students were tasked with developing a solution (prototype app, business plan and marketing plan) relating to sustainable tourism in the city of Porto. In Berlin, students were asked to develop an app-based solution that solved a problem for the local government or for NGOs that work in the city of Berlin. In Antwerp, the students were asked to develop a solution relating to the concept of the 15-Minute City (*Council for New Urbanism, 2021*), as it applies to Antwerp. The local partners were able to give expert feedback to the students as the teams developed their solution over the course of the ten-day project. Getting feedback from the local partners as they went about building a real-world solution helped engage the students throughout the project. Asking students to develop solutions relating to sustainability helped them to think about this aspect of entrepreneurship. Seeing their own solution and the solutions of the other teams helps students to realise the potential for them becoming a sustainable entrepreneur when they leave college.

Active learning methodologies are used to engage students in a Start-IT project. Cornell University states that “*Active learning methods ask students to engage in their learning by thinking, discussing, investigating, and creating*” (Cornell University, 2024). Teams have the autonomy to choose the issue that their mobile app addresses, which promotes independent learning. Making students responsible for their learning and team interaction helps them develop their communication, interpersonal, and conflict resolution skills.

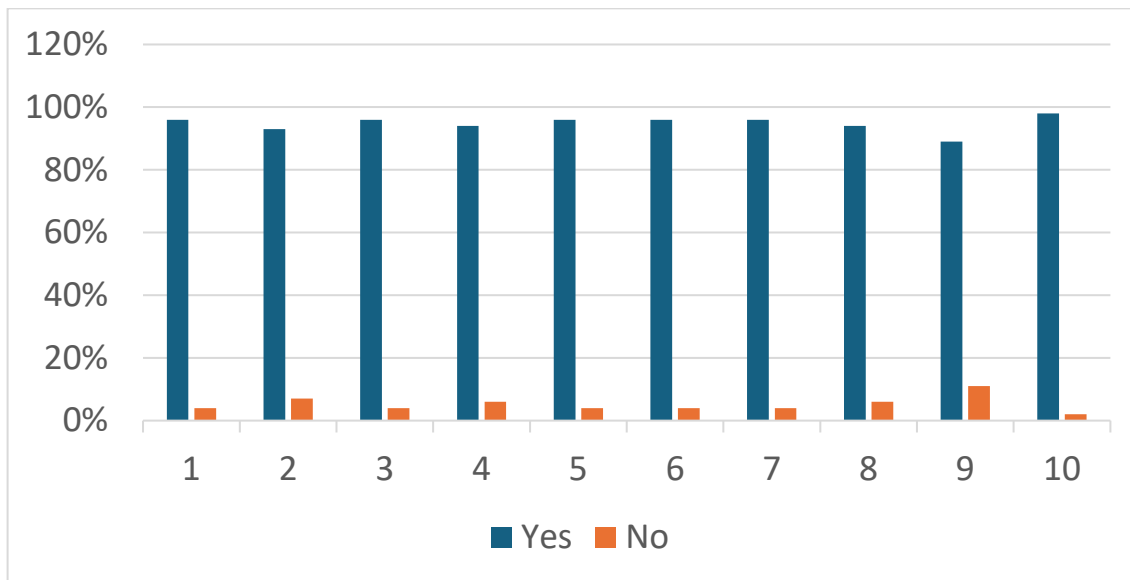
Effective cooperation within a team is crucial for the team's success during a Start-IT project. During the project, academics take on the role of team mentor. Each team has a mentor. The role of the mentor is to keep their team from veering too far off focus. Having mentors helps to keep the teams motivated to achieve their project goals. Daily meetings with mentors ensure continuous feedback, allowing students to compare progress, learn from each other, and improve the quality of their work.

On days two, six, and ten of a Start-IT project, each team presents to the entire student and academic cohort. This provides regular feedback to the students and facilitates the sharing of best practices among the teams. Presentations allow teams to compare their own progress to that of other teams. This encourages all student teams to up their game. This continuous feedback loop, coupled with shared experiences, contributes to the students' focus, sense of meaning, self-esteem, and belonging throughout the ten-day project. This helps mitigate against any feelings of isolation and anxiety that individual students might have. Cornell University states that “*timely feedback, from either the instructor or fellow students, is critical to this learning process*” (Cornell University, 2024).

4. Results and Discussion

The students who participated in the Antwerp Start-IT project were asked to give qualitative and quantitative feedback to ten questions that related to the entrepreneurial aspects of the project. 46 students answered the questionnaire. As shown in figure 1 below, the students' responses were overwhelmingly positive.

Figure 1: Percentage of Yes and No responses for each of the ten questions



The ten questions related to various skills that are required to be an entrepreneur. The percentage of Yes and No responses for each question and two quantitative responses for each question are included in the discussion below:

4.1 Creativity

Entrepreneurship projects challenge students to think creatively. This cultivates an entrepreneurial mindset, encouraging students to explore new ideas and think outside the box.

The students were asked *“Do you feel that this project provides students with a real-world hands-on experience?”*

96% of the students answered YES to this question and 4% answered NO.

Comments from the students in relation to this question included: *“Yes, because you get many different ideas, challenges and real life experience.”* and *“There is a lot things to do and understand, it this just forces you to go in and search.”*

4.2 Critical Thinking

Entrepreneurial projects involve problem-solving, decision-making, and critical analysis. Students learn to assess situations, identify opportunities, and make informed decisions, fostering the development of critical thinking skills.

The students were asked *“Do you feel that this project helps students develop critical thinking skills?”*

93% of the students answered YES to this question and 7% answered NO.

Comments from the students in relation to this question included: *“Yes, it helped my analyze the present things and then develop a perspective to work on anything new.”* and *“Yes because we are expected to already think if something will be asked before the presentation and think about it.”*

4.3 Creativity

Entrepreneurship projects challenge students to think creatively. This cultivates an entrepreneurial mindset, encouraging students to explore new ideas and think outside the box.

The students were asked *“Do you feel that this project encourages creativity?”*

96% of the students answered YES to this question and 4% answered NO.

Comments from the students in relation to this question included: *“The theme was very open so a lot of different projects were created”* and *“In this project we are free to follow our own path. We are able to come up with our own idea and whole design of app.”*

4.4 Innovation

Entrepreneurship projects challenge students to come up with innovative solutions. This cultivates an entrepreneurial mindset, encouraging students to explore new ideas and think outside the box.

The students were asked *“Do you feel that this project encourages innovation?”*

94% of the students answered YES to this question and 6% answered NO.

Comments from the students in relation to this question included: *“Yes especially this one as it's strictly related to the present times”* and *“this project makes me think out of the box.”*

4.5 Collaboration

Entrepreneurial ventures can require collaboration within a team. Working on projects with peers helps students develop effective communication skills, learn to delegate tasks, and collaborate towards a common goal.

The students were asked *“Do you feel that this project helps students improve their collaboration skills?”*

96% of the students answered YES to this question and 4% answered NO.

Comments from the students in relation to this question included: *“Yes, we need to collaborate to deliver a good presentation and service. No-one can do it by themselves.”* and *“We need to work together to finish our app. And the collaboration is the key to it.”*

4.6 Self-confidence

Successfully completing entrepreneurship projects boosts students' self-confidence. Overcoming challenges, presenting ideas, and completing a project contribute to a sense of accomplishment and self-worth.

The students were asked *“Do you feel that this project helps students build self-confidence?”*
96% of the students answered YES to this question and 4% answered NO.

Comments from the students in relation to this question included: *“Yes because you work together, everybody is respectful, also you have the presentations where you have to stand in front of the whole crowd.”* and *“I feel I can contribute to a skilled group now.”*

4.7 Resilience

Entrepreneurial projects often require adaptability as students navigate changing circumstances and market conditions. Students need to embrace uncertainty and develop resilience in the face of setbacks. Learning to adapt to unforeseen challenges is a valuable skill that transcends the entrepreneurial context.

The students were asked *“Do you feel that this project helps students develop their resilience?”*

96% of the students answered YES to this question and 4% answered NO.

Comments from the students in relation to this question included: *“Yes not everything will go as expected critical feedback makes the work changing of course and we need to adapt”* and *“The project is tense, so it has made me become more resilient with dealing with the tasks.”*

4.8 Practical Understanding of Business Concepts

Students gain a practical understanding of business concepts (such as marketing and business planning) by using them in real-world projects. This practical experience complements theoretical knowledge.

The students were asked *“Do you feel that this project helps students to gain a practical understanding of business concepts?”*

94% of the students answered YES to this question and 6% answered NO.

Comments from the students in relation to this question included: *“I am more IT than businessperson but because working on the project I was able to better understand business connected with developing apps”* and *“Totally. I have never worked on a business plan or worked*

out a financial plan before this project, and together with the feedback from the mentors, I think I developed a much better understanding about them.”

4.9 Sense of Ownership

Entrepreneurship projects involve students taking ownership of their ideas and work. This sense of ownership leads students to give a greater commitment to their project and it encourages students to invest time and effort into the success of their project.

The students were asked *“Do you feel that this project gives students a sense of ownership of their ideas and work?”*

89% of the students answered YES to this question and 11% answered NO.

Comments from the students in relation to this question included: *“I took pride in creating the best possible product that I could”* and *“Yes, because we found a start up.”*

4.10 Presentation

By giving several presentations over the course of this project, students should learn to communicate their ideas effectively, refine their presentation skills, and articulate the value proposition of their projects.

The students were asked *“Do you feel that this project helps students improve their presentation skills?”*

98% of the students answered YES to this question and 2% answered NO.

Comments from the students in relation to this question included: *“I was nervous a bit due to not having presented for a long time, but with the encouragement from teachers and friends, I manage to feel more relieved and boost more of my confidence to deliver presentation more smoothly and fluently.”* and *“Not everyone appreciate the spotlight but all of us learned to overcome the fear at least a bit.”*

5. Conclusion

The findings from the Start-IT project highlight the importance of entrepreneurship education in promoting sustainable development and equipping students with the skills and mindset necessary for success in the 21st-century workforce. By embracing innovative pedagogies, fostering multidisciplinary collaboration, and emphasizing real-world application, higher education institutions can play a significant role in preparing future generations of entrepreneurs and change-makers committed to building a more sustainable and inclusive world.

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