Start-IT: A Multidisciplinary Approach to Teaching Soft and Future Skills in Higher Education

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This paper analyses student feedback from a project that took place in Berlin over the ten-day period from 27th March to 5th April 2023. The project involved 61 students from six European Union countries.

The Berlin project is one of three ten-day projects from a larger three-year European Union Erasmus+ co-funded project, which is called Start-IT. The aim of the Start-IT Berlin project was to teach students soft skills and future skills in a multidisciplinary setting. The students were mainly from Computer Science and Business Studies undergraduate degree courses. However, some students from other disciplines also participated in the project. The students from the various undergraduate degree courses and colleges were formed into inter-college, diverse, international and multidisciplinary teams. The student teams were tasked with producing a mobile app prototype, business plan, and marketing plan. The student teams were also required to give three presentations during the project's ten days.

This paper reports on both quantitative and qualitative student feedback from the Berlin Start-IT project.

Index Terms—Multidisciplinary, Higher Education, Soft Skills, Future Skills

INTRODUCTION

Forage defines soft skills as being *"non-technical skills that describe how you work and interact with others. Unlike hard skills, they're not necessarily something you'll learn in a course, like data analytics or programming skills"* [1]. Eulers defines future skills as being *"competences that allow individuals to solve complex problems in highly emergent contexts of action in a self-organised way and enable them to act (successfully). They are based on cognitive, motivational, volitional and social resources, are value-based and can be acquired in a learning process"* [2].

Soft skills and future skills are vital for success in the future workplace. The OECD states that, for students to be successful in the future workplace, *"students will need to apply their knowledge in unknown and evolving circumstances. For this, they will need a broad range of skills, including cognitive and meta-cognitive skills (e.g. critical thinking, creative thinking, learning to learn and self-regulation); social and emotional skills (e.g. empathy, self-efficacy and collaboration); and practical and physical skills (e.g. using new information and communication technology devices)."* [3]. NextSkills agrees with this viewpoint, stating that *"in order to deal with future challenges, students must develop curiosity, imagination, vision, resilience and self-confidence, as well as the ability to act in a self-organized way. They must be able to understand and respect the ideas, perspectives and values of others, and they must be able to deal with mistakes and regressions, while at the same time progressing with care, even against difficulties"* [4]. It is very difficult to teach soft and future skills in a normal classroom setting. To develop these skills, students should learn in new ways. Learning can be multidisciplinary, and learning can incorporate the active involvement of learners. Ideally, students will also integrate societal and business real-world challenges into their learning. Start-IT projects help participating students develop these skills.

START-IT

Start-IT is co-funded the European Union's Erasmus+ programme [5]. Start-IT involves colleges from six European Union countries (Germany, Ireland, Portugal, Belgium, Poland and Finland). Start-IT started in February 2022 and runs to January 2025. Start-IT focuses on providing students with the soft skills, future skills, entrepreneurial skills and IT-skills that are highly sought-after in the labor market. Students gain these skills by participating in a diverse, international, multidisciplinary project, such as the project that took place in Berlin from 27th March to 5th April 2023. A total of three projects, each ten days long, will be held over the lifetime of Start-IT, ensuring that many students benefit from participating in the project.

During a Start-IT project, students are assigned into diverse, international, multidisciplinary teams that are required to develop a mobile app prototype, business plan, and marketing plan that addresses the Erasmus+ horizontal *"environment and fight against climate change"* priority [6].

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 match real-world marketplace needs.

Start-IT projects involve students from multiple disciplines, cultures, and nationalities. Each student on the project brings a unique combination of subject knowledge, cultural diversity, and personal experience to the project. The students are put into diverse, international, multidisciplinary teams of size five or six people. As much as is possible, each team will have one student from each of the six participating colleges. Collaboration between the members in a team is vital for the success of a multidisciplinary project. To function properly, the students in a team must work well

together. Start-IT projects use a cooperative learning methodology to ensure that all the team members gain from the experience of working together on the project. Teacheracadamy states that *"Cooperative Learning is an instructional method in which students work in small groups to accomplish a common learning goal under the guidance of the teacher"* [7]. Cooperative Learning provides *"structured opportunities for learners to work together to learn both content and collaboration skills, such as communication, conflict management, leadership, and decision-making, while also strengthening their commitment to group goals and other group members"* [8]. To ensure that the teams stick to the goal of the Start-IT project, each team is mentored by an academic from one of the six participating colleges.

Student teams are formed on the first day of a Start-IT project. The teams are given ten days to develop a mobile app, business plan, and marketing plan for any application that relates to the Erasmus+ horizontal *"environment and fight against climate change"* priority. Start-IT projects use an active learning methodology. Cornell states that *"active learning methods ask students to engage in their learning by thinking, discussing, investigating, and creating"* [9]. Bonwell states that active learning improves students' content retention ability and improves their critical thinking skills [10]. In a Start-IT project, each team gets to decide the issue that their mobile app will address. During the project, teams spend their time working on their mobile app, business plan, marketing plan and presentations. It is up to each team to manage their time and to allocate tasks amongst themselves.

Start-IT projects focus on student independent learning. Livingston states that *"independent learning is a method or learning process where learners have ownership and control of their learning – they learn by their own actions and direct, regulate, and assess their own learning. The independent learner is able to set goals, make choices, and decisions about how to meet his learning needs, take responsibility for constructing and carrying out his own learning, monitor his progress toward achieving his learning goals, and self-assess the learning outcomes"* [11]. Students who participate in a Start-IT project are responsible for their own learning and for their interaction with the other students on their team. Students on a team must resolve any issues that occur between team members during the project. Placing this responsibility on the students helps them to improve their communication, interpersonal and conflict resolution skills. If a team is not able satisfactorily resolve an internal issue, then the team's mentor can help to find a solution.

On days two, six and ten of a Start-IT project, all the student teams are required to give a presentation to the entire group of students and mentors. The presentations ensure that all the teams get regular feedback. Presentations allow teams to compare their own progress to that of other teams. Cornell states that *"timely feedback, from either the instructor or fellow students, is critical to the active learning process"* [9]. The presentations foster the sharing of best practice among teams. Teams learn from the feedback that they receive after each presentation. This improves the quality of every team's work for the rest of the project.

Every team is required to meet daily with their mentor to discuss progress to date and organize a plan for the day ahead. The combination of presentations, group work and daily meetings ensures that feedback is provided to each student on a continuous basis throughout the project. The presentations, group work and daily feedback also ensure that the students get a shared experience. Gable, Reis & Asher state that *"communicating personal positive events with others is associated with increased daily positive affect and well-being"* [12]. The shared experience is vital to keeping the entire group of 61 students focused during the project's ten days. It gives each student a sense of meaning and enhances each student's self-esteem and feelings of belonging. The shared experience also reduces feelings of isolation and anxiety.

RESULTS

Each day during the Berlin Start-IT project, the students were asked to answer a set of questions that focused on their personal feelings about their team's interaction that day. Over the ten days that the project ran, the 61 students gave a total of 299 responses to the daily survey. The results of the survey are outlined below.

Questions A-C provide feedback about the general interaction within teams. The responses reveal that most students felt they were working in a positive team environment and that they received encouragement from the other team members.

A. Do you feel that your team operates in a positive environment?


■ Yes ■ No
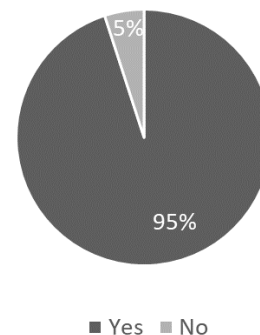
95% of students felt that their team was operating in a positive environment. Positive feedback included *"Yea my team has been very nice overall feeling for the whole project"*, *"Yes we were in a positive and safety environment and the mentor made sure of that too"* and *"Everyone can share their opinions openly and respectfully"*. Negitive feedback included *"Most of the time but some people need to learn not to jump the gun and overtake tasks without asking the team"*.

B. Do you feel that your teammates give you encouragement?

93%
7%
■ Yes ■ No
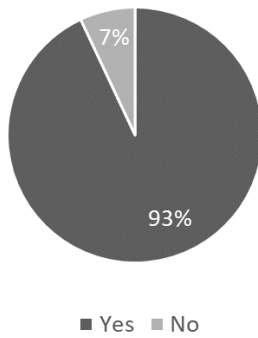
93% of students felt that their teammates gave them encouragement. Positive student feedback included *"Yeah they are supportive of my ideas and in case they aren't they give me the reasons why they aren't"*, *"We share opinions with each other and we discuss about everything, if I'm missing some words in English and can't explain something the way I wanted to they help me say it in other words"*, *"Because their feedback is constructive"* and *"In our group all the other people start asking questions about the idea to make sure that all the point of views are covered and they take all the suggestions seriously"*. Not so positive feedback included *"Most of the team does"*.

C. Do you have positive expectations about your engagement with your team today?

95%
5%
■ Yes ■ No
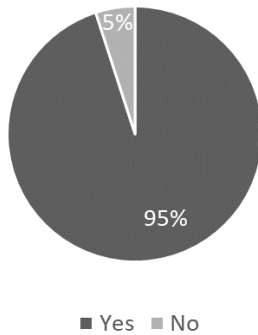
95% of students were positive about how they engaged with their teammates. Positive feedback included *"I feel like our group is starting to have really good spirit and we have clear roles and everything has started going even more positively"*, *"Everyone worked together today and are working on what they are meant to do"*, *"Everybody is productive and motivated"* and *"We are engaging in the project more and more. It's going in a good direction"*. Of the students who did not positive expectations about how they engaged with their team, one student stated *"There is a split in the group especially one guy is unwilling to work and change a template he had made before the project in figma although the group decided we want a different look and feel"*

Questions D and E provide feedback about how much team members value each other. The results show that team members felt valued for the work that they did. The results also show that team members valued the work that other team members did.

D. Do you feel that your team values the work that you do?

94%
6%
■ Yes ■ No
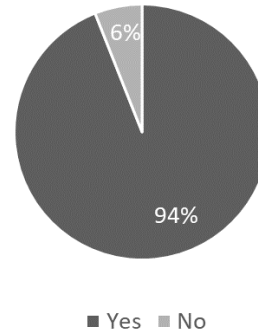
94% of the students felt that their teammates valued their work. Student positive feedback included *"We all value each others work"*, *"We all did our part and it felt nice to be recognised"*, *"Because they have informed me how they consider my work good and valuable for the project"* and *"Yes my tram valued my skills and competencies as I was one of the few business students in the group"*. Of the students who did not feel that their team valued their work, one student stated *"Yes although where was a moment where I was writing on the share doc were a team member started cutting parts of it even though he was meant to be working on something else but this team member just does not understands boundaries"*.

E. Are you confident that your team will complete your project?


92%
8%
■ Yes ■ No
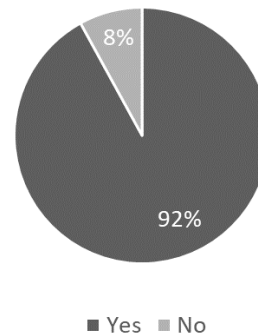
A student being confident about their team being able to complete the project shows that the student believes that the other team members are doing a good job. Most of the students (92%) were confident that their team would complete their project. Positive student feedback included *"My team is going to be ready. We had done most of the work and we are happy about our progress overall"*, *"We are so close to the finish line"*, *"We are on the track of completion of the project"* and *"Yes, because every motivated have a good mentor and everybody is doing its job"*. Feedback from students who were not cofident that their team would complete the project included *"Not yet. We have to see how much there is to do, but I really hope and want to finish our project and present the results"*.

Questions F and G provided feedback about the skills that the students acquired during the project. Question F asked students if the project was helping them improve their technical skills. Question G asked students if the project was helping them improve their communication skills. The results show that most students (94%) felt that their communication

skills improved, while a smaller proportion (68%) felt that their technical skills improved. This makes sense, as the project was focused primarily on developing the soft skills that the students will need to work in a diverse multidisciplinary workplace. From the students' feedback, the improvement that students reported in their technical skills seems to be a result of students from the different colleges introducing each other to new software.

F. Do you feel that this project is helping you develop your technical skills?

■ Yes ■ No
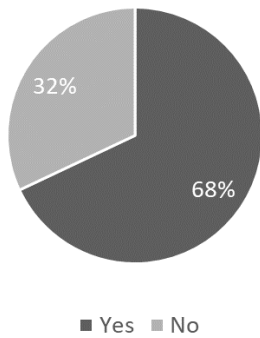
68% of students felt that the project helped them develop their technical skills. Positive student feedback included *"Yes I'm actually using the skills that I had never had the possibility to prove"*, *"You're dealing with new software so we get to learn new things each day"* and *"Still learning all the tools my colleague students use, it's very satisfying"*. Feedback from the students who felt they did not improve their technical skills included *"For me is too much focus on the business site of the project. I know that's important to sell our project but from a technical person view is not interesting enough. I think that the project should be a little more technical challenging"*, *"Nothing used on the project was really all that challenging in a technical aspect. The focus was all on prototypes and presentations and not much on technical development."* and *"I haven't learned anything technical, but I gained skills that are as important"*

G. Do you feel that this project is helping you develop your communications skills?


■ Yes ■ No
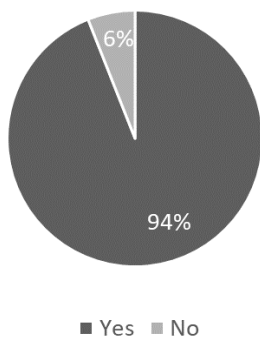
94% of students felt that the project helped them develop their communication skills. Student positive feedback included *"Definitely, because I have never been talking so much about all the business and technical aspects during one week ever before. This helped me understand better how to work in a team and communicate more efficiently.", "Yes, trying different angles to communicate and see what works*

best is a valuable skill", *"it is the perfect opportunity to update the English language and communicate with purpose"* and *"We hangout with people from different cultures so yes"*. Negitive student feedback included *"I have developed my communication skill but also how to hold my opinion back as after being yelled at from nothing I really could have went off on him but he has something going on with him but I am no psychologists and I feel like it would have ended badly. But I have talked to the rest of the team including a Zoom call to practice our power point although him and another member didn't bother showing up even thought we all agreed on a time"*.

At the end of the project, students were asked to give final quantitative feedback relating to their experience of the project. As shown below, the student feedback was very positive.

Question A asked if the project promotes excellence in learning, teaching, and skills development. Questions B and C asked if the project promoted internationalization and interculturalism. Most students (81%) felt the project promotes excellence in learning, teaching, and skills development. Almost all (96%) of students felt the project promotes internationalization and interculturalism.
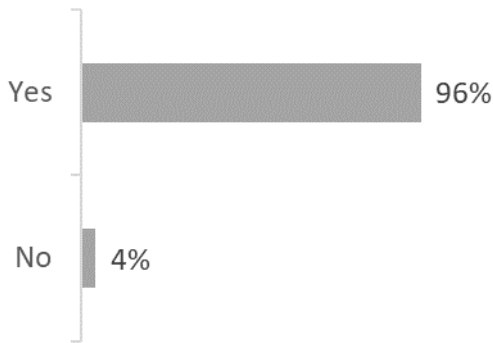
A. Do you feel this project promotes excellence in learning, teaching, and skills development?
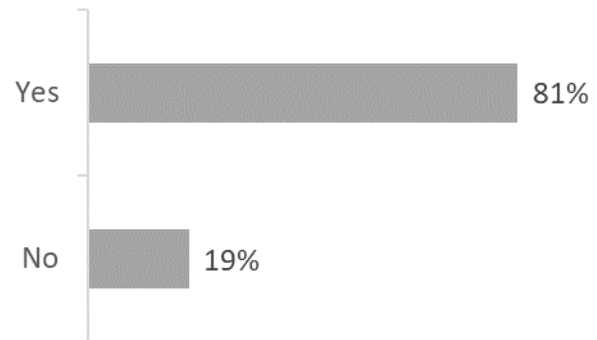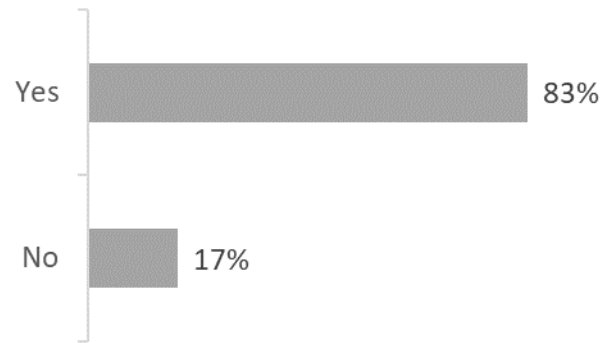

B. Do you feel that this project promotes internationalization?

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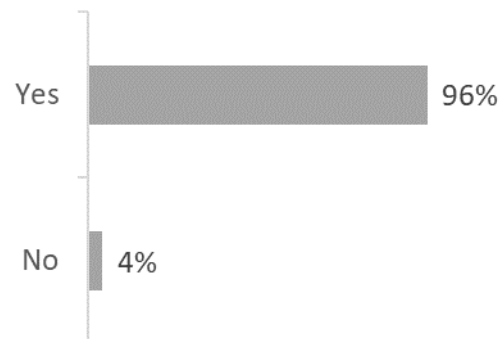
C. Do you feel that this project promotes interculturalism?
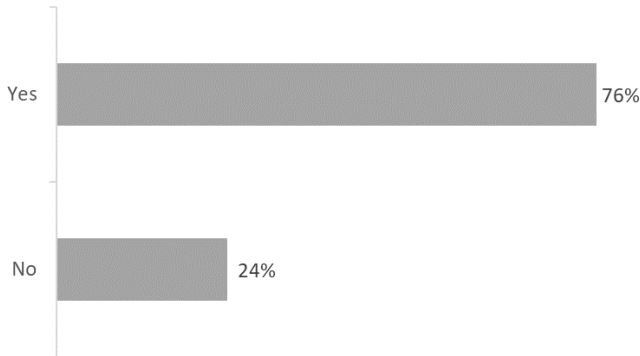

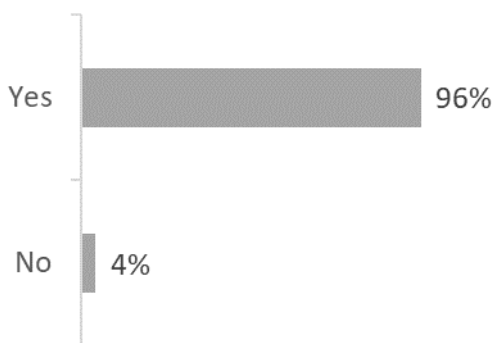*F. Do you feel that this project improved your creativity?*

Questions D-G asked students if they felt an improvement in their entrepreneurial skills, communication skills creativity and critical thinking. Almost all students (96%) felt their communication skills improved. Most felt their entrepreneurial skills (76%), creativity (83%) and critical thinking (89%) improved.
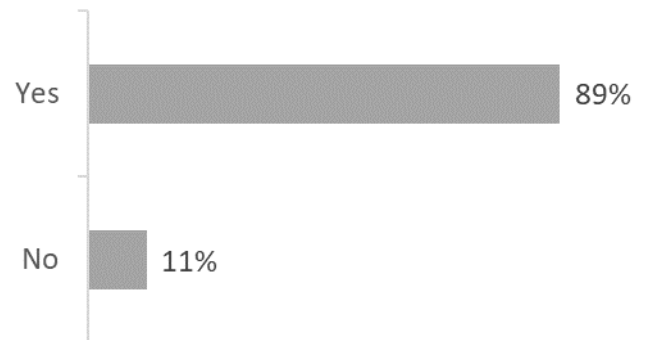
D. Do you feel that this project improved your entrepreneurial skills?

E. Do you feel that this project improved your communication skills?

G. Do you feel that this project improved your critical thinking?

CONCLUSION

The positive student quantitative and qualitative student feedback detailed in this paper is a strong endorsement for the approach that was taken in delivering the Berlin Start-IT project. The feedback shows that students felt their soft and future skills improved because of their participation in this project.

Our results suggest that students benefit by having the opportunity to be immersed in a single substantial multidisciplinary project. Our results suggest that multidisciplinary projects help improve students' soft and future skills.

We intend to replicate the research that was conducted in Berlin at the next Start-IT project to see if the results remain consistent.

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