Entrepreneurship Education: The International Pedagogical Project COTADAS – Co-Creation to Analyses and Development of Strategic Scenarios

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Abstract: The “new normality” and the growing uncertainty that the world faces determine the development of different business and innovative ways of work. To this end, a new mindset and new competences are required to the actors that will participate in these new social and business contexts. Higher Education will certainly have its role in shaping this mindset and competences of the future managers who should be able to participate in the co-creation of value propositions for companies. The project COTADAS (CO-creation To Analyses and Development of Strategic Scenarios) aims to contribute to the training of these future managers. The project aims to analyse and develop strategic scenarios that facilitate intelligent and sustainable value propositions, through digital and intelligent tools. Supported in a multidisciplinary approach and using innovative methodologies, it is intended to facilitate the acquisition of knowledge in less attractive areas for students, namely the areas of finance, revealing how this knowledge can leverage emerging and important areas of knowledge such as innovation, entrepreneurship, and sustainability. The objective of this article is to describe and evaluate the COTADAS project, developed in two Higher Education Institutes (Polytechnic Institute of Setúbal and Federal Institute of Santa Catarina) with Portuguese and Brazilian students. This study is structured in two main parts. In the first part we present a theoretical approach and in the second part we describe the project and the results of the assessment. A questionnaire was applied to participants to evaluate the degree of satisfaction with the project and its impact on entrepreneurial skills. The results revealed a high degree of student’s satisfaction, as well as a valuable impact on the acquisition and development of entrepreneurial skills. Several advantages in participating in COTADAS were pointed out as well as some possible improvements that can enrich the next project edition. Finally, the results allowed us to understand that both successes and failures were important aspects in the students’ learning and personal growth.

Keywords: higher education, entrepreneurship, international education, international program

1. Introduction

The pandemic crisis has brought new challenges to companies and citizens. New ways of working, new business models, new forms of relationship were invented or reinvented to respond to the productive sector and guarantee the functioning of the economy. This renewal requires new ways of thinking and new skills. Higher Education will certainly have its role in the formation of this new mindset and skills of future managers who should be able to participate in the co-creation of value propositions for companies that generate economic, social, and environmental value.

Pedagogical innovation in the context of higher education has become a necessity and a reality that aims to improve the teaching-learning process in a sustainable way, considering the problems and challenges previously mentioned and the social and technological evolution. So, it is important an adaptation of teachers and students to this new economic and social reality.

In this context, entrepreneurial education is considered crucial for the economic and social development of nations. This education allows the training and preparation of students with the necessary competencies,
skills, and attitudes (Heinonen and Poikkijoki, 2006; Lans and Gulikers, 2010; Costa and Carvalho, 2012; Carvalho, Costa and Mares, 2015; Costa and Mares, 2016; Mares, Costa and Galina, 2017). In this sense, project COTADAS (CO-creation To Analyses and Development of Strategic Scenarios) adopt specific teaching methods and strategies, that according with several authors, contribute to the effectiveness of this entrepreneurial education (Smith et al, 2010; Ó Cinnéide, 2010; Blenker and Christensen, 2010). The project aims to analyse and develop strategic scenarios that facilitate intelligent and sustainable value propositions, through digital and intelligent tools.

In this context, the research question emerges “Does COTADAS project impact on entrepreneurial education of the students?”. To answer to this question this paper describes and evaluate the project, developed in two Higher Education Institutes (Polytechnic Institute of Setúbal and Federal Institute of Santa Catarina) with Portuguese and Brazilian students, to understand its contribution to the training of the future managers.

2. Theoretical framework

2.1 International education and crisis

The internationalization of higher education institutions (HEIs) has grown significantly in terms of volume, scope, and complexity over the last few decades. Since the mid-twentieth century, the internationalization of these institutions has increased. This tendency reveals a strong concern and effort to respond to the global economy and cultural dynamics (Goby, 2007).

First, in HEIs, internationalization has evolved between contemporary business curriculum, teaching and learning strategies using international examples, case studies and cross-cultural comparisons (Marginson, 2000; Stohl, 2001). Later, these institutions began to promote exchange programs or international mobility (Hermans, 2007). Both internationalization strategies contribute to multi-cultural learning, as well as to the improvement of international perspectives and students' competences. Also, for Crossman and Clarke (2010) international experience allows the acquisition and development of essential skills and improves employability.

During the COVID-19 pandemic, the internationalization of higher education gained even more importance. The cooperation between research and development groups, laboratories, and academia to find new solutions to problems affected by pandemic, new teaching and learning methodologies was significant. Joint publications with international partners were intensified, as well as bi/multilateral funding for the development of joint research (Babbar and Gupta, 2021).

Nevertheless, the crisis that has taken hold in the educational sector has brought negative consequences for the physical mobility, and impossibility of face-to-face relationships, both for students and professors (Altbach and De Wit, 2020; Ogunode et al, 2021).

This slowdown in physical mobility triggered a search among HEIs for alternatives to these constraints (Toro, 2020), which would allow students to develop skills and achieve the goal of international learning at home (Woicolesco et al, 2021). In this sense, new processes of international and intercultural learning have proliferated through virtual mobility programs. New collaborative online projects, webinars, scientific conferences, short courses, etc. emerge (Woicolesco et al, 2021, in press). According to Altbach and De Wit (2020), these initiatives were developed through the collaboration between partner institutions, strengthening international cooperation ties.

2.2 Entrepreneurship education

Is consensual the contribution of entrepreneurship in the economic development. As referred by Hosseini et al (2020) entrepreneurship has a significant effect on job opportunities, efficiency improvement, and welfare.

Entrepreneurial education is considered not only a way to train individuals to deal with risks, but also a way to promote a culture of associating risks with the other environments of the organization. In fact, the environment context of companies is increasingly dynamic and according with Tajpour et al (2021) these changes in companies causes changes in their attitudes.
Also other researchers, experts and practitioners considerer that the methods of entrepreneurial teaching, as group discussions, lecturing, preparing an action plan for the enterprising, case studies, mentoring by real entrepreneurs, scientific visit methods, storytelling from entrepreneurial experiences, role-playing method, as well as, the development of multidisciplinary projects based on real challenges or problems of companies, are recognised as important contributions in terms of student’s soft and hard skills acquisition (Lonappan and Devaraj, 2011). The challenge is even greater when these projects were developed in an international context (Carvalho, Costa and Mares, 2015; Ryabova, 2020).

According with Heinonen and Poikkijoki (2006) the results of entrepreneurship education are evident and can be measured considering three dimensions: 1) Attitudes (self-confidence, initiative, risk-taking, creativity, problem solving); 2) Knowledge (technical, economic and financial literacy, management knowledge); 3) Skills (communication, presentation and transmission of ideas, teamwork, ability to explore opportunities in the various stages of the entrepreneurial process, including opportunity assessment, execution and business plan).

In this context, entrepreneurial education is considered more effective, capable of training and preparing students with the necessary competencies, skills, and attitudes for the creation of new value propositions (Heinonen and Poikkijoki, 2006; Lans and Gulikers, 2010; Ó Cinnéide, 2010; Blenker and Christensen, 2010; Costa and Carvalho, 2012; Carvalho, Costa and Mares, 2015; Costa and Mares, 2016; Costa, Mares and Galina, 2017).

Precisely due to the demands of the presented context, COTADAS (CO-creation To Analyses and Development of Strategic Scenarios) aims to contribute to the training of the future managers. The project aims to analyse and develop strategic scenarios that facilitate intelligent and sustainable value propositions, through digital and intelligent tools. Supported in a multidisciplinary approach and using innovative methodologies, it is intended to facilitate the acquisition of knowledge in less attractive areas for students, namely the areas of finance, revealing how this knowledge can leverage emerging and important areas of knowledge such as innovation, entrepreneurship, and sustainability.

3. Method

The research strategy for the present study is the case study. This option is related to the need to understand the phenomenon analyzed in a systemic way, with a high degree of depth. According to Yin (2009), the case study “is an empirical investigation that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly defined”. Yin (2009) also states that a case study can focus on a single case or on multiple cases. In this work, a single case study will be carried out.

The general objective of this study is to describe and evaluate the COTADAS project. The specific objectives refer to 1) understand entrepreneurial capacities and skills developed by students during COTADAS, 2) know the most positive and negative aspects of COTADAS recognized by students and 3) evaluate the students satisfaction concerning COTADAS.

The research method used is a survey method. The survey was conducted by distributing an online questionnaire to all participants at the end of the project, during March of the current year. The questionnaire employed closed-ended and open-ended questions and it was divided into three sections that followed the objective defined in this study. The first section collects general information about respondents, the second section collects information about the project’s contribution to the strengthening of participants’ skills and the main positive and negative aspects of the project. The last section collects information about students’ degree of satisfaction with their participation in the project.

The data collected were analyzed considering descriptive and content analysis. The quantitative data were analyzed through descriptive statistics to illustrate the pattern of answers and the qualitative data were analyzed using content analysis (Mason, 2002). This approach allowed the authors to capture the general evaluation of the COTADAS project (Oppenheim, 2004).
4. COTADAS (CO-creation To Analyses and Development of Strategic Scenarios)

4.1 Project description

The COTADAS project focuses on very relevant and current topics related with performance and evaluation in the business context, allowing students to interconnect strategic analysis to the economic and financial analysis of companies. Thus, in this pedagogical innovation project, students could work with tools such as PESTEL analysis, Porter’s 5 forces, SWOT analysis, the CANVAS model and economic and financial analysis, building new value propositions for companies studied, with reference to the main challenges encountered and their impact on financial performance.

The pedagogical methods were based on learning by doing methodology and problem-based learning, where the students could analyse and work on real challenges in the business context of Portugal and Brazil. Students worked in multidisciplinary and multicultural groups, where they could study real cases of listed companies of different nationalities and work with sector and management specialists, contributing to the acquisition of important complementary skills.

In addition, the work was developed in a bootcamp environment, where techniques such as brainstorming, the flipped classroom, the elaboration of frameworks, dashboards, and the realization of presentation pitches of their work were used. These techniques, together with contact with professors in bootcamps, contribute to the acquisition and strengthening of skills, abilities, and attitudes, fundamental for their competitiveness in the job market and for their ability to transfer knowledge in the business context.

The development of the project took place over several weeks through the realization of different activities that we present below.

**Activity 1 - Launch of the pedagogical innovation project:**
Preparation of project dissemination was carried out, to maximize the number of participants and to publicize and promote the project. In this sense, a public event was organized for the community in general, where the project, its objectives and expected impacts were presented.

**Activity 2 - Preparation and organization of the pedagogical innovation project:**
In this activity, materials to support pedagogical activities were prepared and tested (templates and digital frameworks, some recordings of sessions, videos).
In addition, the entire pedagogical program was planned and organized in Moodle (bootcamp activities, framing sessions, videos, among other aspects of the project).

**Activity 3 - Carrying out pedagogical activities:**
The activities were carried out in 8 bootcamps (BC), took place in streaming format, using adapted pedagogical tools, and in each bootcamp were done Complementary Activities (CA) and Intermediate Deliveries (ID).
Additionally, to finish the pedagogical activities of the project, was organized a Meeting, with a Final Delivery (FD). Each bootcamp lasted approximately 1h30m of face-to-face work in streaming and 2h to 3h of autonomous work by each group.

The following table presents the complementary activities and intermediate deliveries associated with each bootcamp (BC).

<table>
<thead>
<tr>
<th>BC: Day</th>
<th>Political factors: a presentation was made about the main actions, financing, relations between countries, degree of government intervention in the economy, etc.</th>
<th>CA1: Organization of teams and choice of companies to analyse.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Economic factors: a presentation was made about data such as, inflation rate, exchange rate, interest rate, employment/unemployment rate and other indicators of economic growth.</td>
<td>CA2: Brainstorming about opportunities from political and economic factors.</td>
</tr>
<tr>
<td>BC: Day</td>
<td>Social factors: a presentation was made of the different</td>
<td>CA3: Use of the Flipped classroom method to</td>
</tr>
<tr>
<td>Day</td>
<td>BC: Day 3</td>
<td>Cultural and demographic aspects of society that form the macro-environment of organizations. Technological factors: a presentation was made on how technology evolves at a fast pace, which makes companies need to be up to date with these changes. Legal factors: a presentation was made on the legal considerations of a business, considering the territories in which they operate.</td>
</tr>
<tr>
<td>Day 4</td>
<td>BC: Day 4</td>
<td>Environmental factors: a presentation was made on the influences of the environment and the impact of ecological aspects. Legal factors: a presentation was made on the legal considerations of a business, considering the territories in which they operate.</td>
</tr>
<tr>
<td>Day 5</td>
<td>BC: Day 5</td>
<td>Factors of the future: presentation of a new analytical category of the PESTEL model, inserting the item F – Future.</td>
</tr>
<tr>
<td>Day 6</td>
<td>BC: Day 6</td>
<td>SWOT Analysis: In a mixed perspective (external and internal), a presentation was made about the elements of this tool.</td>
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<tr>
<td>Day 7</td>
<td>BC: Day 7</td>
<td>Economic and financial analysis: a presentation was made on the economic and financial analysis and on various indicators.</td>
</tr>
<tr>
<td>Day 8</td>
<td>BC: Day 8</td>
<td>Innovative value perception: a presentation of the CANVAS tool was made, discussing all the elements of the framework.</td>
</tr>
<tr>
<td>Day 9</td>
<td>Meeting</td>
<td>A workshop was held to promote lectures and the presentation of the case studies.</td>
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</table>
During the bootcamps held each week, the professors carried out and made available in Moodle, pedagogical support materials on the different topics covered (videos, PowerPoint presentations, word templates, excel models, among other resources), which contributed to a better framing of participants in the objectives of each session. At the same time, the participants putted in the Moodle the various deliveries associated with each bootcamp.

4.2 Results and discussion

COTADAS project have the participation of 19 students from Polytechnic Institute of Setúbal and 10 students from Federal Institute of Santa Catarina that completed the project. To evaluate the project a questionnaire was carried out that sought to know the opinion of the participants about the project’s contribution to the strengthening of their skills and to identify opportunities for improvement in its operation in future editions. It was received 21 responses, which represents 72.4% of the population.

The age group of respondents is between 19 and 36 years. Regarding gender, 66.7% are women and 33.3% are men (Table 2). 21 participants answered the questionnaire, of which 13 (61.9%) are from the Polytechnic Institute of Setúbal and 8 (38.1%) from the Federal Institute of Santa Catarina (Table 3).

<table>
<thead>
<tr>
<th>Table 2: Respondents demographic based on gender and age</th>
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<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
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<tr>
<td><strong>Total</strong></td>
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</tbody>
</table>

As the method was based on international, interdisciplinary, and inter-institutional issues, it was natural for this characterization to exist. Including, the heterogeneity of the participants was explored in the designed method, proposing debates, studies, and creations from the work groups.

<table>
<thead>
<tr>
<th>Table 3: Respondents demographic based on Higher Education Institution and gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polytechnic Institute of Setúbal</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>Federal Institute of Santa Catarina</td>
</tr>
</tbody>
</table>

In the following analysis, we examine the participation of students in the COTADAS project, the impacts of the project on the participants and the students’ satisfaction.

Regarding the time that the participants dedicated to the project, in addition to participating in the weekly Bootcamps, most respondents stated that they dedicate more than two hours a week to the COTADAS project (Figure 1). Considering that the project took place during the school period, this indicator shows that the commitment of most participants was quite satisfactory.

![Figure 1: Average number of hours per week dedicated to the project](image)

Figure 2 provides information about the project contributions in improving participant’s capacities and skills. Most participants consider that their participation in the project contributed to the improvement of skills and competences in terms of teamwork, leadership, research and analysis of information and strategic analysis. On the other hand, participants considered that participation in the project had a smaller impact on improving skills related to market and finance analysis. Thus, the results of the pedagogical activities developed during the COTADAS project seem to meet the model of Heinonen and Poikkijoki (2006) presented in the theoretical framework.
The greater concentration of "agree" and "strongly agree" answers strengthens the thesis that the methodological design contributes to the project's objective. The analysis of environments, financial conditions and subsequent value propositions work in a complementary way. The construction of skills considers the context, in this case, understanding the theory and identifying in practice how it relates to the corporate world.

Figure 2: Project contributions in improving participant’s capacities and skills

To analyse the impact of the project on the participants, they were asked to indicate the main positive and negative aspects of the project. Regarding the positive aspects of the project, the aspects most highlighted by the respondents were the development of soft skills (25.7%), such as communication, teamwork and leadership; the opportunity to have an international and intercultural experience, allowing participants to interact with people from another country and with a different culture (22.9%) and the possibility to apply the knowledge acquired during the course and to learn about other management tools (17.1%). These results confirm the statement of Crossman and Clarke (2010) concerning international experience and its contribution to the acquisition and development of essential skills. Also confirm the importance of the development of multidisciplinary projects based on real problems of companies, as well as the importance of the acquisition of soft and hard skills referred in literature review by Lonappan and Devaraj (2011).

Figure 3: Positive aspects of the project

During the project, problems were observed in the functioning of some groups, namely in organizational and communication difficulties, as well as in terms of the participants' commitment.

These problems were also highlighted by the participants in the responses to the questionnaire. In the opinion of the respondents, the main negative aspects of the project are related to the lack of commitment of some participants (39.1%), the difficulty in finding compatible schedules with the other group colleagues (21.7%) and the constraints associated to the COVID-19 pandemic (17.4%). These aspects turn out to be interrelated, since the differences in the time zone between Brazil and Portugal, as well as the differences in class schedules and academic calendars, caused difficulties for the groups in carrying out the different activities. Also, literature review highlight some of these constraints (Altbach and De Wit, 2020; Jacobs et al, 2021).
The difficulties are related to the very foundations of the project, notably with cultural issues, difficulties in higher education, difficulties in interpretation, among others. It should be noted that the satisfaction of the participants (who answered the questionnaire) can be seen in Figure 5.

The participants were asked to use a 5-point Likert scale (1=Very dissatisfied, 5=Very satisfied) to rate their overall satisfaction. As we can see in figure 5, participants reported a high level of satisfaction with their participation in the project.

Finally, respondents were asked if they would recommend the COTADAS project to other colleagues. As we can see in Figure 6, more than 95% answered positively. This result shows that participants enjoyed the experience of having participated in this project.

The possibility of recommending the project to other students is directly related to satisfaction with the results and confidence in the proposed teaching process. Although difficulties appeared in the work of the groups, the method designed in COTADAS was useful enough to promote qualified knowledge, preparing students with the necessary competencies, skills, and attitudes.

5. Conclusions
This study allowed to conclude that over the last few years, HEIs have been focusing on the development of multidisciplinary projects based on real challenges or problems of companies, due to the contribution of these projects to represent in terms of student’s skills acquisition (hard and soft skills). Also allowed to understand that the challenge is even greater when these projects take place in an international context, as it is the case of COTADAS. The results of the study revealed that the COVID-19 pandemic has brought several constraints, leading HEIs to look for alternatives to overcome these constraints, in order to allow students to develop skills and achieve the goal of international learning at home. COTADAS allowed a new form of virtual mobility contributing to the training of future managers from Polytechnic Institute of Setúbal and Federal Institute of Santa Catarina. From the data analysis it was revealed a high degree of student’s satisfaction, as well as a valuable impact on the acquisition and development of entrepreneurial skills such as leadership, communication, and teamwork. The students pointed out several advantages in participating in COTADAS, highlighting the intercultural experience and the acquisition of knowledge. On the other hand, the students also pointed out some negative aspects regarding the project, mainly associated with the availability and commitment of some participants and the constraints associated with the COVID-19 pandemic. These results
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allowed us to understand the successes and failures of this project and will be very important to improve the next project edition. The findings of this study may be highly useful for academicians and teachers in shaping the international education in higher education system.

Appendix 1

Survey

I – General Issues
1.1. Age: ____

1.2. Gender:

   □ Female
   □ Male

1.3. Select the higher education institution to which you belong:

   □ Federal Institute of Santa Catarina
   □ Polytechnic Institute of Setúbal

II – COTADAS Project

2.1. Indicate the average number of hours per week you have dedicated to the project:

   □ Less than 1 hour per week
   □ Between 1 and 2 hours per week
   □ Between 2 and 3 hours per week
   □ More than 3 hours per week

2.2. How satisfied are you with your participation in the project?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very satisfied</th>
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</thead>
<tbody>
<tr>
<td>□</td>
<td>□</td>
<td>□</td>
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</table>

2.3. Participation in this project has increased your capacity in:

<table>
<thead>
<tr>
<th>Communication</th>
<th>1 – Strongly disagree</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 – Strongly agree</th>
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<tbody>
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<td>Teamwork</td>
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<td>Leadership</td>
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<td>Research, collection and analysis of information</td>
<td>□</td>
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<td>Management tools</td>
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<tr>
<td>Innovation and entrepreneurship</td>
<td>□</td>
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<td>Strategic analysis</td>
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<td>Finance</td>
<td>□</td>
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<tr>
<td>Market analysis</td>
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</tbody>
</table>

2.4. Considering the project, indicate what were the main positive and negative aspects.

   Positive aspects: ______________________________________________________
   Negative aspects: ______________________________________________________

2.5. Would you recommend this project to other students?

   □ Yes
   □ No

2.6. Please indicate reasons for not recommending this project: ________________

   Thanks for your collaboration!
References


