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Speeding Up Student Entrepreneurship: The Role of University Business Idea Incubators

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***Abstract*—Student entrepreneurship is becoming more relevant for universities throughout the world. Therefore, it is important to analyse the strategies and mechanisms adopted by universities to support student entrepreneurship. In this article, we analyse the mechanisms used by universities to promote student entrepreneurship through University Business Idea Incubators as part of their Third Mission. University Business Idea Incubators can act as pre-incubators or pre-accelerators that are designed to help a growing number of university students from different backgrounds interact and develop their entrepreneurial ideas in a safe and creative environment. In such a context, we performed a cross-case study methodology on a national programme that is aimed at creating Italian University Business Idea Incubators. As a result, we have identified the five key features and twelve strategies adopted by University Business Idea Incubators to cultivate student entrepreneurship. The article also presents some examples of successful business ideas developed by students as a result of their participation in University Business Idea Incubators. The obtained results also demonstrate how University Business Idea Incubators foster intellectual capital to sustain the development of an entrepreneurial mindset and competences, with the objective of favouring both the creation of concrete new ideas and of offering new challenge-based learning approaches to university students. We also offer some ideas that could be incorporated in educational policies to support university student entrepreneurship.**

***Index Terms*— Entrepreneurship, Pre-incubation, Student entrepreneurship, Third Mission, University Business Idea Incubator.**

I. Introduction

RECENT studies have shown that student entrepreneurship makes a considerable contribution to the development of entrepreneurial universities [1], [2], [3]. The activities of students connected to the development of ideas and venture creation offer an important contribution to making universities more entrepreneurial and to supporting them in transactions on engineering management [4], [5]. These processes allow universities to be more effective in their Third Mission, by instilling an entrepreneurial mindset and competences in their students [6], [7], and enabling the generation of knowledge spillover [8], [9]. Such a process has also been defined as "nascent" and "active student entrepreneurship" [10]. Nascent student entrepreneurs are those students who are in the process of creating their own businesses, while active student entrepreneurs are students who already own and are running their own businesses. Such students are also known as "studentpreneurs".

Several scholars have studied the role and content of entrepreneurship education, and several initiatives and programmes are now present in universities throughout the world (literature reviews offer a rather comprehensive picture of these programmes [11], [12], [13], [14], [15]). The interest in student entrepreneurship is growing throughout the world, with several studies having analysed mechanisms that can help to sustain it (e.g., [16], [17], [18], [19], [20], [21]). However, to the best of our knowledge, only a few studies ([22], [23], [24]) have analysed how pre-incubators[1] can help university students identity business ideas. These studies did not directly link university pre-incubators to student entrepreneurship. Only a few studies (e.g., [25]) have just mentioned the importance of pre-incubators for student entrepreneurship. While Giordano *et al.* [26] analysed the pre-incubation phase as part of a broader incubation process. Therefore, several questions remain open. In this vein, Voisey *et al.* [23] suggested the need to clarify the features and strategies of university pre-incubation models. Voisey *et al.* [23] also indicated the need to analyse these organisations in other countries since their study had just focused on the UK and many universities around the world are in fact creating university pre-incubators. For instance, Yale University (in the US) has recently created Yale Helix, an

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[1] When using the terms "incubator", "pre-incubator" and "pre-incubation", we are also referring to "accelerator", "pre-accelerator" and "pre-acceleration".

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Undergraduate Healthcare Startup Incubator. This interest is also derived from the fact that students (including management engineering ones) are increasingly demanding access to the knowledge needed to become entrepreneurs [27], [28], [29], [30]. Moreover, corporations are increasingly searching for students who have entrepreneurial competences. However, the efforts made by universities and educators suffer from a certain shortage of skills, finance, infrastructures, access to the business environment and internal support [31]. Within this context, the Italian Ministry of Education, University and Research (MIUR) has financed laboratories (named CLabs) in universities with the aim of developing an entrepreneurial mindset and competences in all types of university students, through the activation of links with actors from the local entrepreneurial ecosystem. In other words, these programmes have the objective of favouring the participation of students from different educational levels and backgrounds, organised in multidisciplinary teams, to develop ideas and projects in a safe and creative environment while interacting with the entrepreneurial ecosystem in coherence with the students' entrepreneurship principles. Therefore, this article has the aim of answering the following Research Question (R.Q.): *how can University Business Idea Incubators foster student entrepreneurship?* To answer our R.Q., we performed a cross-case study in 2020 to analyse the activities and results of 18 CLabs created in Italian universities. Italian CLabs offer a novel view on University Business Idea Incubators at a national level. Given the objectives and mechanisms of CLabs, the OECD has recently considered them as one of the best ways of supporting student entrepreneurship and innovation in Italian universities [32].

Our findings indicate the key features and strategies through which University Business Idea Incubators can foster student entrepreneurship on a broader scale. Therefore, our results qualitatively explain how different universities support certain activities which, also according to Morris *et al.* [33], are relevant to sustain student entrepreneurship and the so-called Third Mission. Our results also demonstrate how University Business Idea Incubators foster intellectual capital to sustain the development of an entrepreneurial mindset and competences. As a result of their activities, they allow incubators to receive "studentpreneurs" with a proof of their ideas. Moreover, they may allow corporations to receive more students who have entrepreneurial competences. In fact, students have the possibility of sharing knowledge with other students from different backgrounds in their pre-incubation activities, and a process of contamination of competences and experiences is thus activated. In particular, our results show that University Business Idea Incubators represent a fertile environment for instilling an entrepreneurial mindset in different types of students and for sustaining some of them through the process of opportunity identification, idea generation and new venture creation. To do so, we also explained some business successful cases created.

II. Background

A. Encouraging Student Entrepreneurship

In recent years, entrepreneurship has been becoming an increasingly attractive employment option, not only for highly-skilled and experienced individuals, but also among university students and graduates [34]. This is also confirmed by the increasing rate of new venture creation by students (especially in the Science, Technology, Engineering, and Mathematics – STEM – fields) and by the rising demand for entrepreneurship educational courses and entrepreneurship support structures in universities across the globe [27], [28], [29], [30]. In fact, several studies analysed entrepreneurship education programmes (e.g., [11], [12], [13], [14], [15]). Nevertheless, Ayob [21] has recently found that entrepreneurship education and entrepreneurial culture are positively related to a prevalence of active student entrepreneurship. Therefore, several national and university policies are now promoting and supporting student entrepreneurship [35]. Large corporations, such as Dell, Yahoo!, Google, Facebook, and Dropbox (just to mention a few), were founded by university students [3]. Additionally, several corporations are becoming more and more interested in hiring employees with entrepreneurial competences and in supporting startups to acquiring productive excellence and developing innovations [36] [37]. These trends have led universities to increase their efforts aimed at promoting activities that have a positive impact on intellectual capital [38], by including courses on the knowledge of entrepreneurship in a growing number of curricula [39]. Technology and engineering schools have demonstrated a great deal of interest in such a direction [40]. On one hand, these activities require universities to increase their efforts in a situation of scarce human and physical resources. On the other hand, such efforts also represent an opportunity to give students important practical experiences for the competitive and insecure graduate labor market, thus improving their employability [41]. This also allow universities to improve collaborations with industries [42]. Nevertheless, research has often only focused on senior researchers or academics in a field known as "academic entrepreneurship" [43], [44], [45]. As a consequence, research on technology transfer and academic entrepreneurship has tended to diminish the importance of the role that student entrepreneurship plays in the technology transfer process [46], [47]. Student entrepreneurship can be considered a relevant pillar of the rethinking of the traditional concept of academic entrepreneurship, where the traditional goal of economic revenue from the commercialisation of research is integrated with such technology transfer activities as patents and academic spinoffs [48]. The final goal is a university model in which student entrepreneurship, academic entrepreneurship and technology transfer to industry are at the core of the efforts many universities are making to transit from a pure research-based model to a more entrepreneurial-based one [49], [50]. Within this overall goal, given the fundamental

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role of universities [51], it is necessary to analyse and plan how universities can improve their support of student entrepreneurship. Universities represent an appropriate context to generate new business ideas and to test entrepreneurial capabilities [52], [53] as well as to create and share knowledge that is useful for the identification of new entrepreneurial opportunities, which can lead to the formation of new ventures [54]. For instance, university entrepreneurship education, rather than entrepreneurship education at a basic educational level (e.g., primary education), has been found to be positively related to the prevalence of nascent student entrepreneurship [55]. This may derive from the fact that entrepreneurial activities take place in a social, organisational and spatial context, together with a wide range of university stakeholders [56], who influence the results of entrepreneurship programmes [57] and offer entrepreneurial competences and unique opportunities to test and experiment ideas (which are fundamental stages for the creation of new ventures [58], [59]). Stakeholders are becoming more involved in developing student entrepreneurship programmes [60], given their interest in employees with entrepreneurial competences. Thus, universities have new collaboration opportunities with the local entrepreneurial ecosystem [61], [62] that allow them to include the stakeholders' points of view and, therefore, to help students work on real topics. All these factors are necessary to both recognise new opportunities and to make the initial business idea evolve over time from an evolutionary perspective [63], [64]. In this sense, the University Business Idea Incubator may represent a good context to offer resources, competences and support strategies that are able to foster student entrepreneurship.

B. Pre-incubation activities

According to Wright *et al.* [25], two of the most important activities that are supported or developed by universities to foster student entrepreneurship are pre-incubators and incubators. Voisey *et al.* [23] found that pre-incubators have made positive economic and social contributions to the local entrepreneurial ecosystem in the UK. In fact, pre-incubator activities in universities are increasing all over the world. Some examples are: LiU Innovation at Linköping University in Sweden [65], the Student Startup Summer Pre-Incubator Programme at the University of Exeter and CreateLab at Imperial College in the UK, the Ubee Lab at the University of Bordeaux in France, as well as eLab at Cornell University, Helix at Yale, and Startup Garage at Stanford University in the US. Some of these activities may be developed in a virtual [22] or hybrid setting. These activities support students in developing their entrepreneurial ideas and in testing them in a safe and creative environment, that is, the university context. According to OECD/EU [66], pre-incubation is also important to select and screen entrepreneurs that go on to receive more intensive incubation support. Pre-incubation programmes involve several services, such as practical-oriented entrepreneurship teaching (including mentorship), co-working spaces and venture labs. As suggested by Assenova [67], mentorship activities are fundamental in fostering, for instance, entrepreneurial creation. Assenova [67] discovered that mentorship is even more significant for those entrepreneurs that have limited knowledge and experience of entrepreneurship. Mentors with different backgrounds are needed for these activities [24]. These mentors may be derived from the universities themselves (from different departments). Nevertheless, since researchers and professors already have several duties, mentors may also come from the local stakeholders. As suggested by Secundo *et al.* [68], the involvement of several mentors increases the complexity of these programmes, but at the same time permits the students to improve their ideas and to network. Similarly, Jansen *et al.* [69] highlighted that meeting and working with other entrepreneurs has been evaluated as a positive contribution towards student entrepreneurship activities. Nevertheless, young are more likely to start businesses in teams [70]. In addition, the members of pre-incubators have an informal background. Scuotto and Morellato [71] emphasised the importance of the role of informal collaborative networks (e.g., students collaborating with firms) in determining the attitude of student entrepreneurs to start a new business. Nevertheless, the activities carried out by students in these programmes may vary from university to university and countries. Therefore, the next sub-section provides a general overview of the Italian situation, in terms of entrepreneurship, to better understand the background of this specific study.

C. Overview of the Italian entrepreneurial ecosystem

In 2012, the Italian government developed Decree-Law 79/2012 which is also known as 'Italy's Startup Act' [72]. As a result, a special section of a firm's register was created to collect data about innovative startups in Italy. These startups needed to meet certain criteria to obtain incentives (e.g., cuts in government fees). At the end of 2013, about 1500 startups had been registered. On the 1st of July 2021, a total of 13582 startups had been registered in Italy. In addition, with Law no. 297/1999, Italian universities and public research institutions began to encourage the involvement of research in commercialisation by fostering the creation of spinoffs [73]. Several additional initiatives (e.g., certified incubators and equity crowdfunding) were introduced to support the Italian entrepreneurial ecosystem [74]. Some of them are also directly connected with Italian student-led entrepreneurial organisations, such as Junior Entreprises or Enactus. As shown in the Report on Italian incubators drawn up by the Social Innovation Monitor, there were 212 incubators in Italy in 2019 (38 of which were legally certified as incubators). Some of these incubators are developing their own seed investing funds. Moreover, some new organisations, named Startup Studios, are

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now appearing in Italy. Furthermore, with Decree-Law 34/2020 the Italian government provides substantial benefits for venture capitalists and business angels. These benefits may support the 1209 Italian business angels identified by the Social Innovation Monitor in 2020 in the Report on Italian business angels and several Italian venture capitals. In line with these policies, the Italian government has also introduced some initiatives regarding R&D, patents, Industry 4.0 and such emerging technologies as artificial intelligence and blockchain. A new foundation, named ENEA Tech, has been developed to support technology transfer in Italy. Some large Italian corporations are also trying to support the Italian entrepreneurial ecosystem. Enel, for instance, was named one of the 10 most active companies, in terms of open innovation, in the Corporate Startup Stars Awards 2020 ranking. Other Italian corporations are now developing entrepreneurial activities (e.g., open innovation and intrapreneurship) by creating ad hoc structures and strategies, such as corporate venture capital funds or corporate incubators. Finally, there are several startup events (e.g., Italian Tech Week), competitions (e.g., regional StartCups in collaboration with PNICube), organisations (e.g., InnovUp, Junior Achievement and the European Institute of Innovation and Technology) and grants (e.g., Premio Gaetano Marzotto) that contribute to fostering the Italian entrepreneurial ecosystem. However, since the Italian entrepreneurial ecosystem has created just one startup unicorn (Yoox), some improvements are still needed. One of the main obstacles is linked to the availability of finance for entrepreneurship. Italy invests a smaller amount in entrepreneurship than other European countries [75], even though some players (e.g., Invitalia, the National Innovation Fund, and Cassa Depositi e Prestiti – CDP) are now trying to solve this problem. Moreover, in order to respond to the recent COVID-19 pandemic, the European Union has recently approved the Italian Piano Nazionale di Ripresa e Resilienza (PNRR) in which there are some incentives for entrepreneurship. Nevertheless, according to the World Bank Ease of doing business Ranking, Italy ranks only 58 out of the 190 countries that were analysed. According to their data, this is mostly due to the high cost and time needed to start a business in Italy. Similarly, the 2020/2021 Global Entrepreneurship Monitor Report shows that Italy has a low entrepreneurial culture level. It is in fact stated in this report that Italy has a lower total early-stage entrepreneurial activity than any of its compeer high-income level countries (e.g., Spain, Germany, Sweden, etc). Moreover, no Italian city is listed in the 30 Top cities in the Global Startup Ecosystem Ranking. This may also derive from the "brain drain" of talented young Italians who leave Italy to start their business in a more developed ecosystem. Italian universities may play a relevant role in fostering entrepreneurship in Italy [76], [77]. Italian entrepreneurs seem to lack the focus and techniques required for them to succeed. Therefore, universities may work towards enriching the entrepreneurial mindset and competences of students. To do so, the Italian government has supported the creation of CLabs. Together with the majority of Italian university entrepreneurship courses, CLabs are aimed at fostering an entrepreneurial mindset and competences in all students. Moreover, the GUESSS Reports [10] have shown an increase in entrepreneurial intention of Italian students immediately after their studies. Chiarello *et al.* [3] have recently explained that the number of startups created by graduated students is relevant in the Italian entrepreneurial ecosystem.

In short, even though there is a growing interest in student entrepreneurship (e.g., [16], [17], [18], [19], [20], [21]), only a few studies have discussed pre-incubation programmes [22], [23], [24]. Nevertheless, student entrepreneurship is growing and becoming relevant for the entrepreneurial ecosystem [78], [79]. Moreover, students, big corporations, SMEs and several others organisations (e.g., incubators) are requiring entrepreneurial competences. The Italian government has recognised this need and decided to finance the creation of Italian University Business Idea Incubators.

III. Research Methodology

In order to address our R.Q., a multiple case study methodology has been followed, as suggested in the literature [80]. A case study methodology is particularly useful for "how" or "why" research questions. This methodology requires observations of the social phenomena and an interpretation by researchers. It is appropriate to analyse events that cannot be controlled. In addition, as also suggested by Jang [81], it is difficult to find open-access datasets to perform quantitative analyses on student entrepreneurship and to compare them across universities. For these reasons, we performed a multiple case study analysis of Italian CLabs. First, we carried out an in-depth investigation of the literature and the Italian entrepreneurial ecosystem out to understand the background of this specific study. Then, as suggested by the literature (e.g., [82]), we performed an analysis of primary (e.g., focus groups and semi-structured interviews) and secondary resources. In other words, we explored our R.Q. through a qualitive multiple case study methodology according to the following three phases: i) case study selection; ii) research design, and iii) research validity. These three phases were performed by considering the entrepreneurship background of Italy.

A. Case study selection

In order to understand the complex phenomenon of creating student entrepreneurs and of making a novel comparison of cases, we chose all of the 18 CLabs launched in Italian universities. The choice of a specific context, that is Italy, was made to reduce the impact of other context variables (e.g., different legislations). In fact, Laskovaia *et al.* [83] stated that different culture contexts can have an impact on entrepreneurship. All the authors of this manuscript are also involved in the creation and the development of several

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entrepreneurial activities regarding student entrepreneurship in the Italian ecosystem. Therefore, the study sample composed of all the 18 CLabs financed by MIUR represents a convenient sample [84] and a good context to analyse the role of the university in sustaining student entrepreneurship, as underlined by OECD [32]. The 18 CLabs are located in almost all the Italian regions, from north to south, in the following universities, which are presented in alphabetic order: Basilicata, Bergamo, Cagliari, Catania, Mediterranea of Reggio Calabria, Modena and Reggio Emilia, Naples, Padua and Verona, Palermo, Pisa, the Politecnica delle Marche, the Politecnico di Bari, the Politecnico di Torino and the University of Turin, Salento, Sassari, Teramo, Trento, and Venice.

B. Research design

A combination of methods - ranging from direct participant observation and semi-structured conversations with CLab staff (professors, mentors and students) and participants in archival research – was adopted to collect primary data, secondary data and literature on the topic. Ethnographic methods, such as observation and conversations with the participants, are a common element of recent studies on organisations [85]. Following a grounded theory approach [86], the data that emerged from the fieldwork were subsequently analysed to identify interpretation patterns. Multiple data collection methods were used to exploit the synergistic effects of combining data via triangulation, which consists in the combination of investigative techniques to reduce the bias of a single observation compared with multiple data [87]. The data collection included primary data (e.g., interviews with the key informants and surveys administered to CLab staff and participants), secondary data (e.g., official documents, official web sites, social accounts) and the literature. The process covered the period from March 2020 to December 2020. Secondary data, such the official documents available on the institutional web sites and social accounts, were analysed to obtain a first general understanding of the 18 CLabs. On the basis of this information, it was then possible to have a first general understanding on the selection modality of participating in the programme, the competition announcement, the learning path, the final outputs and awards, and the value for the participants. Additionally, primary data were collected through several activities such as participation in focus groups with the staff of each Italian CLab. These focus groups allowed us to obtain relevant data on successful stories (e.g., histories of startups created by teams of students). Additional interviews with the key informants were also performed to gain other insights. These interviews were conducted with the project chief, or the CLab project manager, tutors, and participants from 9 out of 18 CLabs who agreed to be interviewed. The 9 interviews were conducted with the CLabs of the following universities: the University of Padua, the University of Cagliari, the University of Basilicata, the University of Bergamo, the University of Pisa, the Politecnico delle Marche, the University of Trento, the Politecnico di Torino and the University of Turin, and the University of Salento. Therefore, different types of Italian universities (from Engineering to Humanities), from north to south Italy, were analysed in depth. The interview was structured around the features and strategies of each CLab, as well as the success stories in order to capture the key elements introduced to foster student entrepreneurship. Moreover, the authors were directly involved in some CLab activities. In parallel, an analysis and interaction between our findings and the papers regarding student entrepreneurship was carried out. After the data collection, data reduction, data display, conclusion drawing, and verification were carried out [88].

C. Research validity

As suggested by Yin [89], we followed three steps for our research validity: internal validity, construct validity, and external validity. First, we ensured internal validity by identifying causal relationships and patterns. This was achieved by relating empirical data to existing research through the identification of causal relationships and patterns of the research. Secondly, we ensured construct validity by utilising a wide variety of primary and secondary sources to establish reliable chains of evidence. In our case, we used a combination of data collection methods, that is, from ethnographic observation to different types of archival documents, such as websites, social accounts, and the literature on the topic. Thirdly, we proved external validity through a generalisation of the study results. This research validity followed an inductive and iterative process [90] to cross-check the findings and, therefore, to generalise our results. As pointed out by Gilmore and Coviello [91], this approach guarantees the highest degree of reliability in case studies based on investigations. As described by Eisenhardt [92], we conducted a series of iterations between primary data, secondary data and the literature, to link the theoretical background to our research. Since interviews and focus groups with different key informants represent the primary sources in case research [93], [94], we derived our primary data from interviews and focus groups with the staff and participants of the CLabs. This allowed us to have access to the informants' views and interpretations [95]. Moreover, as suggested by Czarniawska [85], given the direct involvement of the authors in some CLab activities, we used also direct observations of the interactions between participants and stakeholders during lectures as primary sources of data for this study. The secondary data we considered included archival data, such as official documents, web sites, project reports and social accounts, which allowed us to define the background information on the organisations and to construct a mental picture about the observed phenomena [95]. We analysed the MIUR documents and official website regarding the CLab projects, the CLab websites and their social accounts on YouTube, Facebook, Instagram, Twitter and

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LinkedIn.[2]

Since research data are focused on a single organisational pattern [95] and on relationship factors, independently of the time, it was possible to organise such data through an "open coding" (Strauss and Corbin, [90] p. 101) by analysing and comparing similarities and differences and categorising them. Thus, we codified and synthesised the primary and secondary data in tables to compare different features, strategies and successful business ideas of the CLabs and to identify the key elements.

IV. Research Findings and Discussions

This section is divided into three sub-sections to answer our R.Q. We first present the features of University Business Idea Incubators, and then the support strategies adopted by the University Business Idea Incubators to foster student entrepreneurship. Finally, we present some successful business ideas resulting from the participation of students in the pre-incubation programmes.

A. The features University Business Idea Incubators

As a result of our analyses, we found five relevant features that are common to all the University Business Idea Incubators: selection, application, duration, final event, and awarding. Table I summarises the relevant features of the considered pre-incubators.

TABLE I
THE FEATURES OF THE UNIVERSITY BUSINESS IDEA INCUBATORS

Features	Characteristics
Selection	Motivation, multidisciplinary teamworking and ideas
Application	Calls (selection windows) and/or help desk (always open)
Duration	From 1 to 9 months, with a mix of lectures and mentoring activities
Final event	Business Idea presentation / pitching performed by multidisciplinary teams
Award	Financial support for an incubation or supplementary programme (e.g., collaboration with a corporation)

Selection

Almost all the University Business Idea Incubators focus their selection process more on motivation than on the students' grades. The universities usually follow a two-step process to analyse the motivation of the students. The first step consists of a set of general questions in the application form (such as "Why are you applying for this programme?"), while the second one involves individual interviews, which are needed to understand the real motivation behind the students and their business ideas, if they already have one. We realised that the three most common motivations for the students participating in these programmes were to learn by doing (hands-on experience), to work in team, and to enlarge their network. The University Business Idea Incubators apply several criteria to understand the motivation of the students. The most common criteria concern the perceived behavioural control of Ajzen's Theory of Planned Behavior [96]. For instance, a high level of importance is given to the students' motivations regarding the following tasks: identifying new business opportunities, developing business ideas, being a leader and communicating, building up a professional network, commercialising a new idea or development, challenging traditional ways of thinking, and successfully managing a business. In addition, a high degree of importance is given to previous experience gained in teamwork activities, internship or in a student association, studies abroad (e.g., Erasmus) and volunteering.

All the University Business Idea Incubators explained that multidisciplinary and teamworking are two fundamental ingredients of their programmes. Heterogeneity seems to be particularly relevant, since the entrepreneurship programmes in Italian universities mostly focus on one field of study. On the other hand, university pre-incubators set up a multidisciplinary environment, given the importance of this aspect. As suggested in studies based on the Human Capital Theory (e.g., [97]), teams composed of members from different backgrounds perform better than teams composed of members with a homogeneous background. Some studies (e.g., [98], [99]) also explained the importance of creating teams of students from different fields of study. Accordingly, University Business Idea Incubators try to enroll students from very different fields of study, even though other students are sometimes more motivated. They found that, at the beginning of the programme, most of the students previously attended a course with the professor(s) who was (were) the leader(s) of these university pre-incubators. Their programmes usually became more diffused after about a year and students from almost all fields of study applied. Although most of the students came from Engineering, Economics, Business Management and Production backgrounds, the programmes attracted students form almost all the other fields of study (e.g., Art and Design, Law, Medicine, Philosophy, etc.). This interest from all the fields of study may derive from the appeal of entrepreneurship (some of the most successful startups in the word were created by university students). Nevertheless, the heads of one of the University Business Idea Incubators explained: "*Actually, we*

[2] Some examples of secondary data from the official MIUR website, the official CLab websites and their social accounts can be found on the following links: http://attiministeriali.miur.it/anno-2016/novembre/dd-29112016.aspx, http://digilab.poliba.it/, https://www.youtube.com/channel/UC996TnaiG_5M_ctyyYAwniw, https://www.linkedin.com/school/clabtrento/posts/?feedView=all, https://www.facebook.com/HC.LabContaminationLab/, https://twitter.com/CLab_Pisa, https://www.instagram.com/clab_univpm/?hl=en.

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always try to have at least one student from IT in each team of students, but it is not so easy because students from IT usually already have several projects to work on". Some University Business Idea Incubators create programmes in a specific business sector to strengthen collaboration with the business ecosystem. As one of the project managers of the University Business Idea Incubators explained: "*We created programmes for students in collaboration with industrial partners […] therefore, we had to select a larger portion of students from a specific field of study*". Another explained: "*We are also developing programmes linked to a specific challenge and/or topic […] that needs students from a specific field of study related to those specific challenges and topics*". Hence, students have the possibility of applying for two different types of programme: a pre-incubator programme without a specialised sector, or a pre-incubator programme from a specialised sector.

University Business Idea Incubators usually allow students and existing teams of students to present their ideas in their applications to all the programmes. If a student (or a team) has an idea, the idea is preliminarily evaluated. However, university pre-incubators pay more attention to the motivation of the students or the team than to the idea, since most ideas change during pre-incubator programmes. Interestingly, one of the interviewees explained that they had had such a great interest from international students (not fluent in Italian) that they decided to plan a new programme that would be presented entirely in English to facilitate the participation of such students.

Surprisingly, our interviews suggested that students seem more motivated when these pre-incubation programmes do not give any ETCS credits. Nevertheless, when these programmes do not allow students to obtain a credit, the probability of some students leaving the programmes is higher.

Applications

All the University Business Idea Incubators have one or two calls a year for applications to their programmes. However, only a few of them have a help desk that is always open to give information to students, and it was found that the help desk option was more common in University Business Idea Incubators that support students/teams who already have an idea. In our opinion, the help desk option requires a more structured organisation than University Business Idea Incubators. In fact, such help desks are always open and can therefore support students throughout the whole year.

As a result of the increasing interest in student entrepreneurship, more than one head of the University Business Idea Incubators explained that it was not a problem to obtain a large number of applications. One explained: "*Nowadays, you can find several events on entrepreneurship and our university is interested in fostering such an event. […] when we sent out a call for application, we had a large number of applications from the students*". This may also derive from the fact that these pre-incubation programmes represent one of the few opportunities the students have to work in teams on real problems.

Duration

The length of the programmes varies from 1 to 9 months. Programmes that last less than 3 months are usually more intensive and require at least three activities per week. On the other hand, programmes that last more than 3 months are less intensive and usually require a maximum of three activities per week. This aspect may vary as some of these programmes allow students to obtain credits, while others do not.

A few University Business Idea Incubators develop programmes that are divided into two phases. In these cases, the first phase is mandatory for all the students and lasts from 1 to 3 months. Then, after a mid-term revision, only the best ideas are brought forward to the rest of the programme for another 1 to 6 months. Nevertheless, all these university pre-incubators have highlighted the relevance of revisions during their programmes. All the heads of the University Business Idea Incubators also explained how it is important to offer mentorship throughout the entire programme (especially at the beginning) and to collaborate with the local entrepreneurial ecosystem.

University Business Idea Incubators are only financed by the Italian government for three years. However, the project managers and tutors explained there has been interest in continuing their programmes after this three-year period, since they received positive feedback from the students in this regard. These programmes are not profit-oriented, and they will therefore probably need further financial support through national or EU policies.

Final event

At the end of the course, all the University Business Idea Incubators require the students to pitch their ideas. All these university pre-incubators create multidisciplinary teams to foster a physical and virtual entrepreneurial learning environment. During such a final presentation, the students usually present their ideas using well-known tools like Business Model Canvas. Just a few University Business Idea Incubators require the students to develop a prototype with the aim of defining a Minimum Viable Product. Moreover, just a few of them require the students to deliver a Business Plan that includes financial statements. The students in general appreciate taking part in these events (which are usually well advertised in universities) due to the experience they gain. In line with this, such events create good opportunities for the students to network with representatives from the local entrepreneurial ecosystem.

Awards

In the final event, there is a jury whose role is to award teams that have ideas with a high potential. The jury usually includes

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the head of the University Business Idea Incubator and other relevant stakeholders of the university entrepreneurial ecosystem. If the programme is developed in collaboration with local actors, representatives of these actors are also present. The jury usually adopts various criteria to select the best ideas or innovative projects that have been developed. These criteria are generally related to five topics: i) the financial feasibility of the solution; ii) the technical feasibility of the solution; iii) the ability of the students to analyse strengths and weaknesses (i.e., show the advantages and disadvantages compared to existing solutions); iv) the quality of the teamwork, in terms of the contribution of different disciplines to the idea; v) the effectiveness and quality of the presentation. Some University Business Idea Incubators explained that they also consider the social and environmental impacts of the ideas presented by the teams.

The award is usually related to an in-kind financial support to continue developing the ideas and to help create relationships with the local entrepreneurial ecosystem. In most cases, the award is related to a university incubator programme (or to a programme of incubators that are partners of the University Business Idea Incubators). Just in a few cases do the best teams become connected to the open innovation programmes of large companies. Interestingly, one University Business Idea Incubator also allows the teams with the best ideas to participate in an international programme on entrepreneurship.

B. The support strategies of University Business Idea Incubators

On the basis of our analysis, we identified the 12 support strategies presented in Table II.

TABLE II
UNIVERSITY BUSINESS IDEA INCUBATOR SUPPORT STRATEGIES

Support strategy	Description
Mentorship	Guidance provided by one or more mentors to students. Mentors have a high level of competences and experience (in a company, in an educational institution, etc.) regarding a specific field of knowledge.
Networking with the local entrepreneurial ecosystem	The action or process of interacting with people and organisations outside the university to exchange information and develop professional and/or social contacts. This strategy is aimed at helping students obtain feedback as well as creating future opportunities.
Seminars	Mentors act as facilitators and/or presenters and support the students' intentional knowledge on a specific topic related to entrepreneurship, such as innovation; technology forecasting; design thinking; business model preparation; entrepreneurship capabilities, team development, and creativity.
Case studies	Case study approaches facilitate intentional knowledge sharing among the students and between the students and faculty.
Business idea competition	Student teams identify a business idea and prepare an elevator pitch to present it. In the competition, teams receive constructive feedback and suggestions for the future business development of their ideas.
Business Model Canvas design	By using the Business Model Canvas, the student teams learn how to define and analyse in detail the key elements related to their innovative ideas.
Contamination workshops	Speakers share experiential knowledge about specific themes related to entrepreneurship and innovation. A contamination workshop closes with brainstorming and Q&A sessions.
Entrepreneurs in residence	Innovative entrepreneurs and managers share their experiences, through storytelling, thus offering interesting insights and suggestions to the students.
Open Innovation, problem-based challenges	Companies launch an open call to identify innovation opportunities. The student teams develop innovative solutions to satisfy the call requirements.
Students@abroad	Talented students are invited to participate in conferences, exhibitions and workshop, identify emerging trends, and to create networking and social capital.
Prototype development	The student teams, by accessing enterprise or university research laboratories, implement a first prototype of their innovative business idea
Business plan development	Teams of students, after idea identification, redact the business plan and financial statements of their innovative idea.

Table II presents the support strategies on the basis of their occurrences. The first 5 support strategies, that is, Mentorship, Networking, Seminars, Case studies, and Business idea competition are offered by all (100%) of the University Business Idea Incubators. On the other hand, the last two support strategies, prototype development and business plan development, are only offered by 5 (27%) and 3 (16%) University Business Idea Incubators, respectively.

From Table II, it is possible to note that some support strategies, such as Mentorship, Seminars and Case studies, are linked to entrepreneurship education. This is because these university pre-incubators also work on sustaining the development of the entrepreneurial mindset of students. The head of one University Business Idea Incubators in fact stated "*our programmes create awareness of entrepreneurship in our students*" but also allow the so-called soft skills, such as teamwork, communication skills, and spirit of initiative to be developed effectively. Similarly, a project manager of another University Business Idea Incubators said that "*our programme includes several modules whereby students learn about entrepreneurship by working on real challenges [...] It is an entrepreneurial learning environment centred on the concept of*

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learning by doing". Therefore, the first objective of the University Business Idea Incubators is to develop an entrepreneurial mindset in students. To achieve this objective, they offer practical support activities within a heterogeneity environment. The importance of practice and learning by doing for an entrepreneurial mindset has clearly been described in the literature [100]. Honig [101] emphasised the importance of activities that involve students in more complicated, nonlinear thinking processes.

We also found that these programmes are extra-curricular in a few universities, while they are part of curricular courses (usually minor or elective courses open to all the fields of study) in most of the universities. This is probably because some students may give up participating in the programmes if they are extra-curricular. Moreover, it is also rather difficult to develop courses for students from different fields of study in extra-curricular programmes (for example, it could be necessary to organise some lectures late in the evening or at weekends). However, these support strategies allow students to develop the intellectual capital knowledge required to increase their entrepreneurial competences. One-to-one feedback reinforces this process and, as suggested by Stam and van de Ven [102], intellectual capital development is one of the fundamental constructs necessary to create and develop an entrepreneurial ecosystem. These activities may indirectly foster an entrepreneurial culture inside universities since they also involve professors and researchers from different departments. Certain support activities, such as Mentorship and Collaboration with the local entrepreneurial ecosystem, are aimed at supporting the entrepreneurial competences of students, mainly in terms of the identification of opportunities, and the generation of ideas and new venture creation. One project managers of a University Business Idea Incubator explained "*during the programme, students are supported by coaches, from different backgrounds, to develop different details of their ideas. This support is provided throughout the programme and the students have the possibility of talking to him/her in groups or individually anytime they want*". Similarly, another manager explained "*we literally discovered the power of mentorship in these programmes […] we have 4-5 different mentors for our teams of students for each challenge. These mentors support all the student teams in their activities and in preparing pitches. These experts are from a specific domain, such as Business and Management, IT, or User Design. Moreover, if the challenge is developed in partnership with a company, it makes a mentor available to share expertise in the specific field of the challenge […] We have a mentor for Medicine, and one for Culture and Tourism, since one challenge was related to Medicine and another one was related to Culture and Tourism*".

C. Successful business ideas developed by students as a result of their participation in University Business Idea Incubators

Several teams have developed successful ideas as a result of participating in these pre-incubator programmes. The development of ideas may also require additional activities outside the University Business Idea Incubators. These activities are usually available as a result of collaborations with the local entrepreneurial ecosystem, and they are generally carried out by incubators. Table III presents some successful business ideas that were developed within the Italian University Business Idea Incubators and they are listed in alphabetic order. As can be seen from Table III, these business ideas regard different sectors. These examples were chosen with the aim of presenting some concreate outcomes of the support activities of university pre-incubators for student entrepreneurship. In fact, even though these ideas may receive additional support from the local entrepreneurial ecosystem, they would probably never have been created without the help of the University Business Idea Incubators. The following paragraphs briefly describe the business ideas listed in Table III.

9seconds App

The 9seconds App is aimed at changing a person's relationship with their smartphone and therefore their life and social habits. Through a game, based on a waiver-reward mechanism, the application rewards players for the time spent offline with offers and vouchers. The University Business Idea Incubator of Salento gave these students the opportunity to create a network, thanks to the Student@abroad initiative and a contamination workshop, with important players on the market. The University Business Idea Incubator offered mentorship and the opportunity of participating in an important competition that awarded them a cash prize to set up a startup. According to the CEO of 9seconds App: "*participation in the programme allowed us to grow professionally and to acquire technical and personal skills that traditional university courses do not offer*". Nowadays, the COVID-19 pandemic has had a huge impact on this business idea, so that the team is now working on redefining their initial business idea by re-engineering the technical solution.

Artaxy

The aim of Artaxy is to introduce art into everyday life. There are thousands of artists around the world who create works of art every day and which, in most cases, remain hidden. On the other hand, there are countless public and private spaces that could be enhanced by art. Artaxy brings together these two realities and transforms them into a single solution: a platform that unites art and space. The team is composed of students from IT and Sociology and has won some prizes. Artaxy was started in 2018, in the University Business Idea Incubator of Trento, which, according to the founders, "*allowed our project to take its first steps. Ideas, intuitions and thoughts of all kinds have over and over again been put into black and white in "flying" sheets! An idea is nothing without execution*". Nowadays, Artaxy is supported by an incubator from the local

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entrepreneurial ecosystem.

Astarte edizioni

The aim of Astarte edizioni is to give voice to the art and culture of countries in the Mediterranean Basin, by enhancing their material and immaterial cultural heritage, with a view that ranges from the local to the global. The team is composed of students from Language, Art and Culture backgrounds. Astarte edizioni is now the first academic spinoff in the Humanity sector of the University of Pisa. Today, Astarte edizioni has several scientific committees made up of professors and researchers from different universities. As one of the members explained: "*The business idea was already conceived during a university course, but participation in a seminar organised by the CLab, entitled "Humanist and Business is possible", allowed all the aspects of the business project to be defined. Then, the CLab gave us all the necessary instruments and tools to start a new business venture with an incredible networking opportunity, thanks to the seminars and activities they organised. Moreover, CLab supported us in the process of becoming a spinoff of University of Pisa*". Astarte edizioni has had access to microcredit instruments of the Region intended to foster entrepreneurship.

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TABLE III
SUCCESSFUL IDEAS DEVELOPED WITHIN ITALIAN UNIVERSITY BUSINESS IDEA INCUBATORS

Name	***University of the University Business Idea Incubator***	***Field***	***Aims***	***Web site***
9seconds App	University of Salento	Social Science	Reduce smartphone addiction	n.a.
Artaxy	University of Trento	Art	Diffusing art	https://www.artaxy.com/home
Astarte edizioni	University of Pisa	Cultural Heritage	Promoting Mediterranean Culture	http://www.astarteedizioni.it/
Bacfarm	University of Cagliari	Biotechnologies	Developing innovative technologies for extracting biomolecules	https://bacfarm.com/
Ciby Spray	University of Salento	Health care	Preventing bacterial infection of the skin	under construction
HiveGuard	University of Cagliari	Biotechnologies	Allowing the remote monitoring of bee hives	https://hiveguard.it/
IntendiMe	University of Cagliari	Health care	Improving the quality of life of deaf people	https://www.intendime.com/
Monobit Games	Politecnico di Torino and the University of Turin	Smart technologies	Creating video games to diffuse long-term knowledge	http://monobit.games/
RestWorld	Politecnico di Torino and the University of Turin	Ho.Re.Ca. (Hotellerie-Restaurant-Café)	Creating a web platform for ho.re.ca workers	https://www.restworld.it/
Up The Frequency	Politecnico di Torino and the University of Turin	Electric mobility	Reinventing charging stations in a town/city	https://www.clabto.it/progetti/frequency

Bacfarm

The aim of Bacfarm is to provide innovative solutions to create the best natural products for their customers. Bacfarm uses an innovative technology to extract carotenoids and antioxidant biomolecules, with benefits on human and animal health, and which are useful for various applications: from cosmetics to nutraceuticals, from food to medicine and pharmacy. Bacfarm was set up in 2019 from the matching of the entrepreneurial spirit of the co-founders with the scientific capabilities of the research laboratories of University of Cagliari. The services offered by the University Business Idea Incubator of University of Cagliari, such as mentorship, prototype development and networking, allowed the team to participate in a regional competition and to win a National Innovation Award. Bacfarm then exploited a technology patented by the University of Cagliari. The members have a background in Medicine, Biological sciences, Agrifood and Management. Bacfarm, which is an academic spinoff, received an investment from a corporation and is now supported by the incubator of that corporation.

Ciby Spray

Ciby Spray (Coating Indicator of Bacterial Infection) is an innovative spray patch which, thanks to natural pigments that are sensitive to the skin's PH, protects wounds and changes colour in the case of a bacterial infection. The spray technology makes the product easy to apply and produce. It is also eco-friendly and therefore respects the person and the environment. The final goal is to reduce the use of antibiotics to only the strictly necessary cases, and thus to help to avoid the phenomenon of bacterial resistance. The creators of the idea said: "*Thanks to the CLab services, especially the mentorship, thematic seminars and contamination workshops, we have had the possibility of increasing our competences in the field of management and entrepreneurship and the possibility of creating an interdisciplinary team. A Business Plan Competition allowed us to define the market for our prototype and to identify the possible stakeholders in the projects*". Nowadays, the team is working on the first prototype, and it has submitted a patent application to protect its innovative solutions.

HiveGuard

HiveGuard helps beekeepers to prevent swarming and detect diseases. It allows hives to be monitored remotely through a dedicated application. The aim of HiveGuard is to understand any problems (e.g., diseases) that may exist inside a hive, without having to open it. The team is composed of students from Industrial Engineering and IT backgrounds. They defined their participation in CLab as "*a unique experience that makes you see the world from a completely different perspective*". Interdisciplinarity, knowledge sharing, and contamination workshops were important key factors for the success of the team. The team is now collaborating with beekeepers. They

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developed a prototype and they have created a company based on this idea.

IntendiMe

The aim of IntendiMe is to improve the lives of deaf people through an innovative system that allows people with hearing problems to be notified about everyday life noises. The team is composed of students from Humanities, Management, IT and Electronic Engineering backgrounds. The team created a startup in 2020. The idea originated from the needs of one of the co-founders, who is the daughter of deaf parents. Thanks to the University Business Idea Incubation services, an interdisciplinary team was created and a first prototype of the project was defined. "*The Contamination Lab supported us in developing our idea. It was our starting point as a company*", said the co-founder of IntendiMe. The IntendiMe company then received a round of investments from a VC.

Monobit Games

Monobit Games aims to create products that combine the principles of game design, storytelling and the neuroscience of learning to create video games that have a long-term impact on the knowledge of their players. The students in the team came from Management, IT studies, Art and Design. One of the founders stated: "*The idea started at the CLab; I presented it in front of a group of people, we decided to go ahead with it, and we won. This was the first encouragement to actually start working on the project… CLab has been the glue of our entire programme and it has allowed us to create stable networking with the local innovation ecosystem*". The team has already developed three games, established a venture and is currently part of a university incubator.

RestWorld

The aim of RestWorld is to improve the intellectual capital value in the Ho.Re.Ca. sector through the development of an online platform. The team is composed of students from Psychology, Management, Mechanical Engineering and IT. The team has two important collaborations with national associations in the Italian Ho.Re.Ca. sector. According to the CEO, the University Business Idea Incubator is "*a very stimulating environment because, first of all, we learned a lot of things during formal and frontal lessons and we met a lot of very intelligent people with entrepreneurial ideas and the desire to do something, and we were therefore able to profit from both the information and the energy of the programme*". RestWorld is supported by a university incubator and have received funds from professional investors.

Up The Frequency

Up The Frequency is a good example of open innovation and collaboration with the local ecosystem. The aim of this project is to reinvent electric mobility charging stations in cities, without disturbing the urban structures of the cities. The project was developed by students from different backgrounds: Energy, Sociology, Philosophy and Architecture. First, the programme gave them the opportunity to get to know each other. As a result of the programme, the team had the possibility of getting in contact with an energy utility that was one of the partners in the programme. The founders said: "*Through the CLab, we set up contacts with a large company that shares its experience, and then we started to know how to analyse industrial plans, business plans, product making, product analysis, and product management in all sectors, both through experiments and case studies, which allowed us to understand how to develop our idea*". Nowadays, the team is working with this company on a European Project in order to test their first prototype.

These business ideas represent successful examples of student entrepreneurship developed through University Idea Business Incubators. They may help to attract other students to participate in their programmes. However, the success of University Idea Business Incubators cannot be measured only by these successful case studies. For instance, as explained by Matt and Schaeffer [103], these activities are not limited to the formation of companies, and may include several universities entrepreneurial support activities that may not lead to the creation of new firms. Therefore, it is necessary to consider the overall long-term impact of the entrepreneurial mindset and competences on all the students that take part in such programmes. To have a better idea of the impact of University Business Idea Incubators, other indicators could be considered, such as: the variety of the students' fields of study, the number of interdisciplinary teams created, the number of students that spend a period abroad participating in international or national conferences and workshops, the number of international students that have enrolled, the networking opportunities created among students from different levels of education, the number of business ideas that end up in incubators, the number of faculty members that represent the industry context, the number of university departments involved in the programme, the relationships with actors from the local and/or international entrepreneurial ecosystems (in terms of contact or agreements), the number of universities/research centres involved in the programmes, the number of open innovation programmes that have been activated, the number of new internships, and the number of venture capitalists or business angels involved in the programmes that sustain the ideas or programmes. Some of these indicators have been validated by the Italian Ministry of research, which funds the CLabs, to explain how University Business Idea Incubators contribute to the Third Mission of universities.

In short, Italian University Business Idea Incubators can be considered a new mechanism to support student entrepreneurship in the Italian context. However, these findings may also be useful for all international readers since they may help them to understand how to create and develop University Business Idea Incubators. Our findings explain, for instance, what the key features and strategies adopted by Italian University Business Idea Incubators are to cultivate student entrepreneurship. These features and strategies could be applied and adapted to other universities outside Italy. The article also presents a few successful business ideas developed by students

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after their participation in University Business Idea Incubators to obtain an understanding of some possible outputs. As it is possible to see from our results, a multidisciplinary environment, with entrepreneurial competences aimed at the future generation of new entrepreneurs (inside and outside universities and corporations), is fundamental to foster intellectual capital. The multidisciplinary environment concerns students and the faculties. Our findings also explain that, unlike incubators and university incubators, University Business Idea Incubators only focus on pre-incubator activities aimed at developing student entrepreneurship. By doing this, University Business Idea Incubators may allow universities to overcome some of the challenges related to the development of student entrepreneurship. For instance, they help mitigate the effects of several obstacles, such as a lack of entrepreneurial mindset and competences in students and the unknown market potential of their ideas. University Business Idea Incubators may also allow universities to enhance their collaborations with other actors in the local entrepreneurial ecosystem as a result of intense networking. These activities may also encourage universities to activate or enhance open innovation collaborations with companies. However, as we explain, there are some obstacles that have to be overcome in order to develop permanent University Business Idea Incubators. Despite these obstacles, we explain that University Business Idea Incubators represent an incubator of intellectual capital that could be replicated in a different context from the Italian one.

V. Conclusion

Student entrepreneurship is becoming more relevant for universities worldwide [78], [79]. For instance, several European universities are developing strategies and mechanisms to support student entrepreneurship [40]. Some examples of these mechanisms are the Entrepreneurship Centres that have been created in several universities, such as at ESADE, Delft University, Montpellier Business School, the Technical University of Munich, and the University of Oxford, just to mention a few. The European Commission and OECD, in an attempt to support student entrepreneurship, are encouraging different activities, such as the EECOLE (Entrepreneurship Education Collaboration and Engagement) network, EntreComp (European Entrepreneurship Competence Framework) related projects, the European Institute of Innovation and Technology also with their Knowledge and Innovation Communities, the HEI Initiative - Innovation Capacity Building for Higher Education, the Junior Achievement and Junior Entreprises activities. In line with this trend, MIUR decided to support the creation of CLabs in Italy. This intervention by MIUR is also in line with the other innovation strategies that have recently been developed by the Italian government to improve the overall entrepreneurial knowledge and competences of Italian citizens.

Since the number of these strategies and mechanisms to support student entrepreneurship is increasing, it is important to analyse them [23], [104]. The aim of this manuscript has been to improve our understanding of student entrepreneurship by investigating the role of CLabs as Italian University Business Idea Incubators. Compared to other European strategies, CLabs were developed by Italian universities to answer a specific call by MIUR. Therefore, Italian University Business Idea Incubators are the result of a call to action by the Italian government's policymakers to universities. As a result of our analyses, we explain how University Business Idea Incubators foster students' entrepreneurship through their key features and strategies. University Business Idea Incubators support the pre-incubation phase of the development of students' ideas through a multidisciplinary approach in order to help them develop and test their entrepreneurial capabilities in a safe and informal environment. The multidisciplinary setting, with regard to both university students and the faculty, is one of the novel attributes of CLab, compared to other strategies and mechanisms developed by universities. This setting allows University Business Idea Incubators to create an environment that facilitates business idea creation through mentorship regarding several fields of knowledge. Su *et al.* [105] in fact explained that heterogeneity has a positive impact on entrepreneurial bricolage. University Business Idea Incubators promote a wide array of activities to include different types of students: from bachelor to Ph.D. students, with either a STEM background or from the humanities field of studies. Having students from different backgrounds and with different educational levels makes it possible for both STEM and non-STEM students to work together in a unique learning and informal environment. Our results show that University Business Idea Incubators are effective in supporting student entrepreneurship through intellectual capital development at two levels. First, University Business Idea Incubators sustain the development of an entrepreneurial mindset in students. Second, they support the entrepreneurial competences of students. These aspects allow universities to increase the individual capabilities of students and decrease institutional barriers, which, according to Bailetti [106], are two fundamental principles that are necessary to foster student entrepreneurship in universities. In this way, it is possible to foster student entrepreneurship in several university courses and in a setting that cannot be created outside universities. In addition, and in line with the Third Mission of universities, another key attribute of University Business Idea Incubators is the close connection with the local entrepreneurial ecosystem. We have observed that some students who attended the activities offered by University Business Idea Incubators created successful business ideas. In fact, University Incubators of Business Ideas also have the aim of creating a stable and quality deal flow for incubators, thus effectively contributing to student entrepreneurship, as suggested by Lamine *et al.* [107]. Furthermore, these activities allow corporations to have access to students that already have entrepreneurial experience.

Although this study presents some interesting results, it is not free of limitations. First, this work focuses on only one country.

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However, our findings may be useful for other contexts. Nevertheless, in line with the suggestion of Jang [81], we would like to invite future researchers and professors to work on setting up an international open-access database for student entrepreneurship. Moreover, even though some participants in CLab programmes are in the process of creating their own businesses, while others have already done so and are now running their businesses, some others may have decided not to follow this path. Nevertheless, future studies could analyse whether students with entrepreneurial intentions and capabilities are more likely to participate in intrapreneurship or open innovation activities to obtain a better understating of student entrepreneurship that is not limited to only student entrepreneurs. In addition, we analysed CLabs and some successful cases pertaining to their participants, but we did not analyse the effects on any of the other actors in the entrepreneurial ecosystem. Since several studies (e.g., [108]) have discovered that innovation entrepreneurial ecosystems are fundamental for the creation, survival and development of startups, future studies could be directed towards analysing all the different actors in the entrepreneurial ecosystem for student entrepreneurship to obtain a broader picture. It would also be interesting to analyse how to obtain grants and other financial instruments to support these initiatives. Some Italian universities are developing crowdfunding programmes to financially support the entrepreneurial ideas of students. Additionally, due to the COVID-19 pandemic situation, it is important to understand whether and how the space and equipment universities offer as supports (e.g., co-working space, maker spaces, labs etc) can become virtual and facilitate the development of proof of concepts [22], [109]. It would also be interesting to analyse these activities regarding a specific sector (e.g., Artificial Intelligence or Blockchain) or from a specific point of view (e.g., female student entrepreneurship [110] or minority and migrant entrepreneurship) considering all the features of the local entrepreneurial ecosystem. Finally, a more international background needs to be considered for these activities.

These results have theoretical and practical implications. First, we show that in order to develop intellectual capital on a large scale, universities must make stable and long-term oriented investments in University Business Idea Incubators. Strategies related to University Business Idea Incubators focused on creating an entrepreneurial mindset and competences in students cannot be developed by other institutions with the same degree of effectiveness, thus indicating their key role in such a process. Nevertheless, we suggest the need to develop a stronger focus on multidisciplinary settings, in order to leverage on the full set of competences available in each university, while mixing STEM and non-STEM students. As a result, Business Schools, Arts and Humanities universities, Engineering universities and all field-specific universities may collaborate to support student entrepreneurship. Unlike the majority programmes on entrepreneurship, we show that teamworking with students from different educational levels and fields of study, but also the contribution of mentors and experts from different application fields, are necessary to develop new ideas. These findings could be useful to define guidelines for the design of pre-incubation programmes within universities in collaboration with all the actors of an entrepreneurial university ecosystem. These programmes should be aimed at sustaining student entrepreneurship as part of the university's Third Mission. We made also differences between pre-incubators for student entrepreneurship and incubators. Although incubators are highly selective when choosing startups [111], University Business Idea Incubators are more focused on playing a positive role to help students develop and refine ideas. Finally, we highlight that the success of University Idea Business Incubators cannot only be measured by considering successful case studies and we therefore present some additional possible metrics that could be used for this purpose.

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