

## EVALUATING THE UNIVERSITY-BASED ACTIVITIES TOWARDS THE CONCEPT OF AN ENTREPRENEURIAL UNIVERSITY: REFLECTIONS ON A CASE OF A HEI

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**Purpose:** This paper attempts to shed some light on the entrepreneurial university concept through the examination of a selected technical university in Poland in the opinions of international master's students. The main objective of the research is to gain insights of students' evaluation of entrepreneurial activities, incentives and support measures offered to them at the university as well as to identify areas requiring improvement or change to fit into the concept of an entrepreneurial university.

**Design/methodology/approach:** The nature of the case study is descriptive and practical orientated. The technical university case of implementation of the entrepreneurial university framework was selected with a purposeful sampling technique. Primary data were obtained in 2022-2023 using the method of reflection (112 reflective essays from international master's students), participatory observation, inductive method with an interpretative approach, and inference in the form of recommendations.

**Findings:** Even as a subjective and descriptive case study, it illustrates the real entrepreneurial practice in implementing the concept of an entrepreneurial university. The findings provide insight into students' expectations for effective result-driven entrepreneurship education and business collaboration. Furthermore, the study highlights areas requiring improvement to build more effective entrepreneurial pathways and inclusion for international students.

**Research limitations/implications:** Due to the purposeful selected informants within the case and its qualitative nature, no general conclusions can be drawn. Moreover, the subjective nature of the essays and the language barrier could have influenced the perception and evaluation of entrepreneurial incentives and support measures offered at the university by foreign-language students.

**Practical implications:** The examples of good practice reflected in the study and the recommendations for improvement can be an inspiration for academics, students and university decision-makers involved with entrepreneurship, internationalization and the study at higher education more broadly.

**Originality/value:** The originality of the conducted qualitative research lies in presenting the real university context and international students' reflections on supporting activities and gaps in the field of entrepreneurship development at a technical university. The value resulting from the study are recommendations with practical implications for the University authorities, the academic community and institutions supporting entrepreneurship.

**Keywords:** entrepreneurial university, entrepreneurship education, internationalization, students' reflections.

**Category of the paper:** Research paper, case study.

## 1. Introduction

Nowadays, Higher Education Institutions (HEIs) face increasing challenges in terms of defining their purpose, basic and applied research, development strategies, as well as their responsibility and impact on society, the environment and the economy. Socio-economic changes of recent years have all shed new light and have imposed new demands on higher education systems across the world. All this contributes to changing the role of universities and transforming them into an entrepreneurial one, and even more to “empower universities as actors of change in the twin green and digital transitions” (European Commission, 2022, p. 8). Furthermore, as outlined by the European Commission on a European Strategy for Universities (2022, p. 9), the new framework need to “facilitate and reinforce transnational cooperation between universities to strengthen their capacities to equip young people, lifelong learners and researchers with the right competences and skills”.

It is worth noting that the development of entrepreneurial universities is fostered both by external and internal pressures. Moreover, great emphasis is currently placed on the need for high flexibility of a university in its response to the environmental requirements (Mascarenhas et al., 2017; Klofsten et al., 2019; Audretsch, Belitski, 2021; HEInnovate, 2023), especially to digital transformation (Guerrero, Heaton, Urbano, 2021; Garcez, Silva, Franco, 2022; HEInnovate, 2023) as well as towards a mission-reorientation to social innovation (Menter, 2024).

Entrepreneurial universities are crucial actors in the facilitation of technology transfer from science to business, knowledge spillover and start-up creation. Furthermore, they are considered as important “drivers” for regional, economic and social development. For these reasons, it is necessary to conduct research on practical implementation of this concept and establish support measures to create favourable environments for entrepreneurship at the university level and beyond. Nowadays, universities are expected to be more active players, linked to their external environment by having a strong presence in the local community contributing to the ecosystem sustainability. This might include for example, providing opportunities for regional start-ups or established companies, participating in regional ecosystem and taking an active role in determining the strategic direction of local development (OECD, 2012; HEInnovate, 2023). Moreover, in response to the demand of different stakeholders an effective cooperation between universities, governance, and a business ecosystem is required (Badzińska, Mrugalska, 2022).

The current changes in the surrounding environment require new competences and new ways of teaching and learning (European Commission, 2022; Guerrero et al., 2021; Sidrat, Chaudhry, P.E., Chaudhry, S.S., 2023). Creating widespread awareness among staff and students of the importance of developing entrepreneurial skills and abilities is therefore an important function of an entrepreneurial university. Furthermore, as internationalisation is increasingly integrated into the strategic processes of higher education institutions, it has become essential for entrepreneurial universities to be able to enhance performance in a multicultural environment. “Perceptions of entrepreneurship and attitudes towards entrepreneurship and entrepreneurs are a crucial element of a cultural context, influencing not only the way entrepreneurship is interpreted but also the behaviour of individuals as entrepreneurs, employees, and customers” (Glinka, Megyeri, Tabajdi, 2023, p. 123). Therefore, “the need for skilful and multicultural competent graduates with an entrepreneurial and intrapreneurial mindset is crucial” (Badzińska, 2020, p. 444) and more attention should be paid to the development of student-oriented participatory teaching and sharing with peers.

The evidence reveals a tendency to use case studies to explore and build understanding on the phenomenon of an entrepreneurial university (Guerrero, Cunningham, Urbano, 2015; Byun et al., 2018; Erkut, Thierbach, 2019; Huang, Liu, An, 2020; OECD, 2022; Kaya, Guerrero, Lira, 2023; O’Flynn et al., 2023). Possible reasons are related to a large range and variety of characteristics of this issue, a lack of one universally recognized method and indicators for measuring this phenomenon, a large number of variables depending on the regional environment as well as many qualitative factors. According to Henry and Lahikainen (2024), HEIs are actively encouraged to strive towards entrepreneurial university status to enable them to deliver their third mission and create entrepreneurial graduates. To critically examine the intrapreneurial activities of five HEIs the researchers asked the core question: What activities do HEIs engage in as part of their entrepreneurial university journey.

Following this line of research, the author of this paper conducted qualitative research aimed at understanding the scope and nature of activities offered to students at a university that strives to be an entrepreneurial one. The nature of the qualitative study is descriptive and the case of Poznan University of Technology is studied here. The author attempts to assume main insights together with current reflections on the concept of an entrepreneurial university focusing on preconditions necessary to transform a traditional university into the entrepreneurial one. In turn, the empirical part is reflective and provides an illustration of the opinions of international master's students in the field of “Managing Enterprise of the Future” about the practical implementation of this concept. The main objective of the research is to gain insights of international students’ evaluation of entrepreneurial activities, incentives and support measures offered to them at the university, as well as to identify areas requiring improvement or change to fit into the concept of an entrepreneurial university.

Research limitations of this study resulting from the analysis of a purposefully-selected case of a technical university do not allow formulating general conclusions. Furthermore, the subjective nature of the essays and the language barrier could have influenced the perception and evaluation of entrepreneurial incentives and support measures offered at the university by foreign-language students. Nevertheless, the international students' reflections illustrate the real entrepreneurial practice and thus contribute to the discussion on the role and impact of universities in stimulating entrepreneurial potential. Moreover, what students believe is particularly valuable, because students are supposed to be the recipients of most of the activities provided by the university. This type of research is subjective in nature, but students' further actions depend also on the subjective perception of the university support.

## **2. Theoretical Background of the Concept of an Entrepreneurial University**

The role of universities as a driving force for entrepreneurship development in the wider regional, social and business environment envisages a structural shift from their traditional missions to a third task: the commercialization of knowledge and new solutions in the form of patents, licences, and university-based start-ups as well as research-based spin-offs (Scuotto et al., 2019). Thus, the strong collaboration at university–industry–government interfaces as a regional innovation strategy is the implementation of the third mission of the university (Etzkowitz, 2012). In this context, “the entrepreneurial university serves as a conduit of spillovers contributing to economic and social development through its multiple missions of teaching, research, and entrepreneurial activities” (Guerrero, Cunningham, Urbano, 2015, p. 748). The crucial goal is to “enable universities to play a creative role in economic and social development from an independent perspective while still being responsive to government and industry priorities” (Etzkowitz, 2016, p. 83). According to Mascarenhas, Marques, Galvão and Santos (2017), entrepreneurial universities focus on changes in the university paradigm towards a better understanding of past trends and future directions. This area is particularly important today in the context of the university's contribution to socially responsible and sustainable activities and the change “from third mission to sustainable development co-creation” (Rinaldi et al., 2018, p. 67). It is even claimed that the university should transform to the university for the entrepreneurial society as well as from technological to social innovations (Menter, 2024). While an entrepreneurial university is a response to generate and transfer technology and knowledge-based start-ups, “the role of the university in the entrepreneurial society has broadened to focus on enhancing entrepreneurship capital and facilitating behaviour to prosper in an entrepreneurial society” (Audretsch, 2014, p. 313). Currently, the entrepreneurial university is perceived as a driver for economic growth and social change, therefore attention

should be paid to the strategic challenges that these universities face today (Klofsten et al., 2019).

The concept of an entrepreneurial university is now well established in the academic literature (Etzkowitz, 2016; Guerrero et al., 2016b; Mascarenhas et al., 2017; Klofsten et al., 2019; Forliano, De Bernardi, Yahiaoui, 2021; Cunningham, Lehmann, Menter, 2022). One of the expectations placed on universities is the involvement of internal and external stakeholders to look for mutual cooperation mechanism to facilitate and accelerate knowledge spillover and absorption of innovative practice-oriented solutions developed at universities (Etzkowitz, 2017). Part of this response is the development of academic fields and areas of research that focus not only on “knowledge for its own sake”, but rather oriented towards knowledge for solving specific and compelling problems as well as challenges confronting society (Audretsch, 2014, p. 317). Thus, entrepreneurial universities play an important role as both knowledge-provider and a disseminating institution. Moreover, the new socio-economic conditions require universities not only to generate and transfer knowledge but also to contribute and provide leadership for the creation of entrepreneurial thinking, actions, and institutions (Guerrero, Urbano, Fayolle, 2016a).

In the subject literature there are identified various theoretical models associated with the creation and development of an entrepreneurial university or even its transformation. In a review of scholars' approaches to conceptualising and operationalising the entrepreneurial university, Badzińska (2020) identifies several different models that have emerged over the past two decades. These include: I) five pathways to institutional transformation into the entrepreneurial concept with strong commitment of academics (Clark, 1998); II) a formal process model of transformation with a specific focus revising the organisation's existing tasks (Etzkowitz et al., 2000); III) guidelines for institutional renovation incorporating new hybrid organisational forms (Etzkowitz, 2004); IV) an adaptive universities approach with a focus on organisational culture (Sporn, 2001); V) a framework of formal and informal strategic actions with a focus on recognition and reward (Kirby, 2006); VI) and a framework with the environmental dimension that highlights the university's attitudes toward entrepreneurship as well as academic reward systems (Guerrero et al., 2016b). Moreover, “the preconditions for the transformation into an entrepreneurial university can be divided into the endo- and exogenous factors, both formal and informal ones” (Badzińska, 2020, p. 451). As Etzkowitz (2016) aptly notes, the entrepreneurial university model paradoxically includes both increased university autonomy and greater involvement of external stakeholders.

Critical factors are used to shape changes in the organizational structures of universities leading to the verification of the mission statement and strategy (Cunningham et al., 2022; Menter, 2024). The aim is to become aware of the existence and functioning of the entrepreneurial ecosystem and the possibilities of creating practice-oriented study paths in the field of entrepreneurship. However, effective cooperation with research centres and the business environment is necessary to accelerate the transfer of knowledge from universities,

the development of applied research and the appropriate adaptation of the results obtained to the needs of society, environment and the economy. From this point of view, the transformation of decision-making and leadership roles, as well as responsibility at the organizational level requires networks, strategic alliances, and joint entrepreneurial projects with industry, government, and other higher education institutions.

Creating and sustaining business-science relationships with key partners and stakeholders is essential in achieving the full potential of an entrepreneurial university in research, teaching and entrepreneurship mission activities. The stimulus for this commitment is the creation of value for both the university community, especially students, and society. Therefore, the development of entrepreneurial practices in universities is considered a significant contribution to support the strategic development of education and research, linking universities in a meaningful way with their entrepreneurial ecosystem.

Although the concept of an entrepreneurial university has received considerable attention over the last years (ACEEU, 2017; Baglieri, Baldi, Tucci, 2018; Brown, 2016; Bucos, 2021; Compagnucci, Spigarelli, 2020; Forliano et al., 2021; Horner et al., 2019; Maniglio, 2018; Pacheco, Ferreira, Simões, 2023; Qamariah, Muchtar, 2021; Sanyal, 2023), further comparative case studies and considerations of the practical aspects of its implementation are expected in order to explore and disseminate good practices as well as to identify gaps and areas requiring improvement. The latest literature reports on this topic investigate among others: intrapreneurial capabilities and activities in the context of the entrepreneurial university (Klofsten et al., 2019; Cunningham et al., 2022; Henry, Lahikainen, 2024) additionally in relation to the digital era (Guerrero et al., 2021; Garcez et al., 2022). Unlocking the potential of HEIs for innovation and entrepreneurship still constitutes a significant challenge for the academic community. Following this research line, the author attempts to investigate the entrepreneurial pathways and activities offered by a selected technical university based on the reflections and assessment of international students.

### **3. Research methodology**

The empirical method makes use of a case study involving the analysis of entrepreneurial initiatives and incentives undertaken by a selected technical university. The rationale for the use of the case study is its usefulness for the practice-oriented approach (Yin, 2013) and it builds understanding on the phenomena as an interpretative study in the selected context in a naturalistic form (Czakoń, 2015; Sułkowski, 2009). The nature of the study is descriptive and reflective and it illustrates the opinions of respondents based on their reflective essays which highlight the real university-based entrepreneurial practice. Thus, the objective of the research is to gain insights of international students' evaluation of entrepreneurial activities, incentives

and support measures offered to them at the university, as well as to identify areas requiring improvement or change to fit into the concept of an entrepreneurial university.

The subject of the research is the Poznan University of Technology (PUT), which was selected using the purposeful sampling technique (Yin, 2013). This selection resulted from a pragmatic criterion of data availability, a clear example illustrating the problem studied as well as the observed and reflected factors influencing the development of an entrepreneurial university. The case study description is created following the Entrepreneurial University Framework by OECD (2012) and the HEInnovate self-reflection tool for HEIs (2023) to explore the entrepreneurial potential of the case studied here. However, the multidimensionality of the concept of an entrepreneurial university requires the acceptance of limitations of the study area. So the main question is how the selected technological university develops and supports the entrepreneurial pathway for its students and how does this process meet with the entrepreneurial university framework.

The objective of the exploratory qualitative research covers students' experiences and reflections on as well as the evaluation of entrepreneurial activities and support measures provided to them during their full-time master's studies at the PUT. To achieve the research goal the study was conducted using the method of reflexion, participatory observation, inductive method with an interpretative approach, and inference in the form of recommendations. Reflection is an important human activity in which the participant consciously thinks about an experience, assesses what happened and offers an evaluation. A critical aspect of reflection is that it is conscious and deliberate (Boud, Keogh, Walker, 1996; Brookfield, 1998). Moreover, reflection involves considerations of thoughts, feelings and actions.

Primary data was obtained from 112 reflective essays from international master's students (each for approx. A4 format) which represented 14 countries worldwide (mainly from the countries of North Africa, Arab countries, as well as Central and South America and Eastern Europe). At the studied University, at the Faculty of Engineering Management, foreign students constitute an increasing group of recipients of the services offered. According to the Faculty's data (October 2023), 16.5% of full-time students are foreigners (fields of study: Engineering Management, Managing Enterprise of the Future and Logistic), but in the field of Managing Enterprise of the Future itself this share is already 25% and has a growing tendency, which justifies the purposeful selection of this group of respondents.

Students who participated in the study were informed by the teacher (author of this study) about the entrepreneurial university framework (OECD, 2012) and the European policy context related to entrepreneurship and innovation in higher education (EIT's HEI Initiative, 2022; HEInnovate, 2023). The purpose of the reflective descriptions was to explore in more depth international students' experiences and evaluation related to the entrepreneurial opportunities and incentives offered to them at the PUT. The modes of the reflective essays were primarily descriptive and evaluative and offer suggestions for improvement. In order to achieve the

research objective and exemplify the students' opinions, the following research questions were posed: (I) What does it mean to be an entrepreneurial university and what activities do this concept apply to support students' entrepreneurial education, actions and attitudes?; (II) Does Poznan University of Technology fit into the concept of an entrepreneurial university providing incentives to stimulate the development of entrepreneurship?; (III) What are the critical improvements or changes needed to develop towards an entrepreneurial university?

The reflective essay was a voluntary assignment and the students were notified that the purpose of the descriptions is to explore their experiences and expectations according to the entrepreneurial pathways offered at the PUT and the study constitutes the first stage of the conducted experimental research. What is more, the reflection helps identify strengths, opportunities and potential, but also shows where gaps and needs for improvement exist. The confrontation of multiple data sources justifies the iterative nature of data collection in the years 2022-2023. The data gathered during the research process includes the perspective of international students. The criteria for the purposeful selection of students were as follows: (I) a full-time master's student in the field of Managing Enterprise of the Future; (II) a period of study at the PUT of at least three semesters; (III) completion of a course in "Entrepreneurship in contemporary economy" and "Technological entrepreneurship". It was assumed that students of this selected field of study should have sufficient knowledge and experience in the field of entrepreneurship to be able to assess activities that fit into the concept of an entrepreneurial university and identify areas for improvement. In the next step, the reflective essays were subjected to a semantic analysis in order to identify repeatable categories/keywords indicated by respondents when assessing activities consistent with the concept of an entrepreneurial university. The inductive method was used here, in which the so-called observational statements are often based on the researcher's individual and intuitive judgments (Nowak, 2012). Moreover, an interpretative approach was adopted (Sułkowski, 2009; Sułkowski, Lenart-Gansiniec, 2021), assuming that a thorough understanding of the phenomenon is possible only by understanding the motivation of the participants in a given situation (Glinka, Czakon, 2021).

The empirical data are augmented by publicly available reports on entrepreneurial activities of HEIs (OECD, 2022; HEInnovate, 2023) as well as of the PUT (2024). Moreover, the author draws on contemporary literature presenting case studies of entrepreneurial universities, to enhance understanding of the nature and scope of activities in which HEIs engage as part of their entrepreneurial university journey. Thus, the necessity to confront a variety of data sources forced the application of the principle of triangulation (Glinka, Czakon, 2021). Data only from secondary sources did not provide sufficient saturation of information for the research objective.



## 4. Results and Discussion

### 4.1. The case of Poznan University of Technology

The study provides a picture of the selected Higher Education Institution (HEI) in a general, descriptive form. The Poznan University of Technology (PUT) is the best technical university in Wielkopolska Region and among the best universities in Poland. Established in 1919 as Higher State School of Mechanical Engineering was transformed in 1955 into Poznan University of Technology. The PUT therefore has a 100-year tradition. The educational and scientific offer of the Poznan University of Technology is very wide and diverse and it provides education for about 16,000 students with more than 1300 academic staff. Candidates can choose between 9 faculties, 44 fields of study, and almost 60 post-graduate courses as well as doctoral studies in many fields of research. The entrepreneurial-driven activities offered for students include, among others: a large number of scientific circles (around 70) and 10 student organizations operating at nine faculties (PUT, 2024). A wide range of specializations is addressed to people who want to develop their professional skills in practice, get better career opportunities in their field of work or have the possibility to grow intellectually.

The “Development Strategy of Poznan University of Technology 2021-2030” is a response to the needs of the environment and illustrates the University's ambitions for continuous development of innovation, technology and the highest quality of education. The socio-economic environment defines the most current needs and seeks strong partners. The essence of innovation and progress lies both in the internal potential of the organisation and in the synergy between science and business. Moreover, the vision of the Poznan University of Technology is to strive to be a technical university with a leading international position, creating significant solutions to key problems of the modern world through high quality education and the highest level of scientific as well as research and development work (PUT, 2024). The above statements are in line with the assumptions of an entrepreneurial university concept.

In practical terms, the entrepreneurial university approach of PUT is expressed through the visible business-science collaboration. It should be emphasized that PUT has close business relationships with many international companies (e.g. VW, Beiersdorf, Solaris, Bridgestone, Samsung Electronics) which allows students to collaborate on research projects and develop commercial solutions. In terms of internationalization, an important pillar is the cooperation with other educational and research institutions. The University has around 230 worldwide agreements with HEIs in Europe and outside as well as it is affiliated with numerous associations such as CESAER (Conference of European Schools for Advanced Engineering Education and Research), SEFI (European Society for Engineering Education), EUA (European University Association), IAU (International Association of Universities), ADUEM (Alliance of Universities for Democracy) and the Baltic University Program (BUP) and many others. In the context of an entrepreneurial university, PUT's involvement and being a leader in the

project of the European University for Customized Education (EUNICE, 2023-2027), currently the alliance of ten European partner universities, should be emphasized. The EUNICE is designed to provide students with unique and personalised learning pathways, promote knowledge exchange between staff, support interdisciplinary research and implement educational solutions that respond to global challenges while addressing regional socio-economic issues. The role of the University is seen as a hub for the regional ecosystem, one of the key features of an entrepreneurial university. Moreover, customised education plays a vital role in empowering regions by leveraging human capital, collaborating with business partners and responding to local development needs and capacities. On the other hand EUNICE also facilitates connectivity cooperation between European regions and the global community (EUNICE, 2024).

#### **4.2. International students' reflections on supporting activities and gaps in the field of entrepreneurship development at PUT**

The applied exploratory research aims at presenting real opinions of PUT international students about pro-entrepreneurial activities, programs and support measures offered to them that fit into the concept of an entrepreneurial university. In addition, they were asked to share their comments on areas for improvement. The respondents were 112 full-time master's students in the field of Managing Enterprise of the Future who participated in classes on "Entrepreneurship in contemporary economy" and "Technological entrepreneurship" as well.

Below are presented the opinions of students concerning mainly five areas in relation to the OECD Entrepreneurial University Framework (2012) and the HEInnovate self-reflection tool (2023), namely: I) Organizational capacity: people, resources, incentives and rewards; (II) Entrepreneurship development in teaching and learning; (III) Pathways for entrepreneurs; (IV) University-Business relationships for knowledge exchange; (V) The internationalised institution. Based on the fieldwork data obtained from the reflective essays, it can be concluded that international students notice a number of initiatives to support entrepreneurship and innovation among students and faculty, including entrepreneurship courses, start-up incubator as well as workshops and competitions within the EUNICE project (e.g. Start Cup, Contamination Lab). Moreover, they indicated that entrepreneurial mindset is implemented in curricula of such subjects as: corporate management, enterprise competitiveness, technological entrepreneurship, entrepreneurship in contemporary economy, business internationalization, enterprise development, concepts and tools of modern business management, and many others in the field of social sciences.

In relation to the Academic Incubator students stated that it offers workshops, seminars and competitions, e.g. "Entrepreneurial Students for START". This undoubtedly confirms the support of entrepreneurial attitudes, however the Incubator strives to promote the entrepreneurial activities only among Polish students, because it does not organize any events in English, at least they don't know about them. In addition, the surveyed students are aware

about the Technology Transfer Center that assists researchers and students in commercializing their research outcomes, patenting and developing innovative products and services. They mentioned also the Students and Graduates' Internship and Career Center as an university-wide unit which promote students and graduates from PUT on the labour market.

Among the positive aspects that fit into the concept of an entrepreneurial university, students pointed to PUT's strong focus on scientific and application research as well as numerous projects and partnerships with industry. In their opinion, the University has strong ties to a variety of local and regional businesses providing them with access to the university's expertise and resources, as well as creating opportunities to collaborate on R&D projects. Moreover, the international students underlined a strong track record of cooperation with industry and businesses as important aspect of an entrepreneurial university. They pointed to the successful event, which was the Festival of Internships and Apprenticeships in April 2023, where they had the opportunity to directly contact such companies as e.g. Tesla, VW, Beiersdorf, PROMAG, Samsung Electronics, Dimark Manufacture, DFDS Polska, Exide Technologies, Rhenus Logistics) (FEM, 2023).

In addition, the participants of the study emphasized a strong international focus and involvement in a number of international research collaborations and partnerships, which is important for developing an entrepreneurial mindset and fostering innovation. Moreover, they confirmed that PUT enjoys a good reputation for providing high-quality technical education, therefore internationalization is important to increase its competitiveness both in Europe and on the global market.

Although PUT has made some efforts to promote entrepreneurial culture and develop towards an entrepreneurial university, the University's overall focus remains on traditional academic pursuits. Referring to the opinion of international students, entrepreneurial pathways are not prioritized and many areas require changes for more effective use of the University's potential. Using the collected empirical material, the table below (Table 1) contains the most frequently repeated categories/keywords indicated by students in the reflective essays and exemplary statements in the form of quotes. Areas selected here are those that, according to the respondents, require significant improvements. Moreover, the students' assessment and suggestions may constitute guidelines for practical implications by the Faculty and University authorities, the academic community and staff as well as by support institutions as Incubator or Career Center.

**Table 1.**

*Students' reflexions on PUT as an Entrepreneurial University with areas requiring improvements*

Areas related to Entrepreneurial University	Examples of respondents' statements	
Organisational capacity: people, resources, incentives and rewards	categories/keywords	Areas requiring improvements
	networks of investors, mentors, and entrepreneurs	<i>I think it would be highly beneficial to encourage students and provide them with opportunities of networking and mentorship.</i>
	entrepreneurial culture	<i>When it comes to entrepreneurial culture, it is still too conservative and risk-averse, which can be a barrier to entrepreneurship and innovation. To enrich it all parts of the university must work together in interdisciplinary teaching and research groups.</i>
	promotion of entrepreneurial activities, communication	<i>The encouragement towards entrepreneurial way of thinking has not been communicated effectively for students and still this way of thinking is not witnessed between students. There should be better advertising for the available funding or projects opportunities.</i>
	rewarding entrepreneurial success, academic reward systems	<i>To encourage students to engage in entrepreneurial activities, the university should create a clear reward system and publicly recognize and promote the achievements of its students and potential start-ups.</i>
	Academic Incubator, start-ups	<i>The Academic Entrepreneurship Incubator is operating within the University but it has not been made known within the student's community. Greater promotion of the existing academic incubator is needed to encourage students to try and take the risks involved in setting up a start-up.</i>
	Centre of Internship and Career	<i>The PUT should bring the job market closer to the student with the help of the Centre of Internship and Career, because it's hard to find any interesting internship for international students.</i>
Entrepreneurship development in teaching and learning	curricula	<i>The university has to update the teaching curricula to place more emphasis on practical knowledge and prioritize entrepreneurial pathways. The educational program should be developed in more practical way and accommodating to current management trends.</i>
	entrepreneurship education	<i>Providing entrepreneurship education based on real-world experience can make a contribution to improvement of entrepreneurial teaching and learning.</i>
	professional development	<i>PUT could encourage students to seek for jobs and create better environment for their professional development. The University could offer many opportunities to meet professionals, people who could share their own experience.</i>
	project-based teaching problem-solving	<i>Introducing more interdisciplinary and project-based teaching methods that encourage collaboration and real problem-solving approach</i>
	practical experiences and skills development	<i>The study curriculum lacks appropriate practical courses that can assist students in their everyday lives, providing them with hands-on, real-world experience and help them acquire the skills and knowledge.</i>
	eCourses platform	<i>Communication in English must be improved – the eKursy platform is not fully translated and causes confusion.</i>

Cont. table 1.

<b>Pathways for entrepreneurs: preparation and support</b>	funding and financial support	<i>There is a need of providing diversified sources of funding to meet the diverse needs of students und potential entrepreneurs. The University ought to present and make some sort of Entrepreneurial Foundation program which will be made to help and assist students with an excellent business idea/plan by supporting them with funds, resources, training and coaching.</i>
	scientific and application research	<i>While the University has a strong focus on research, this is often focused on basic research rather than applied research that is relevant to industry and society, which can limit the impact of the university's research activities.</i>
	interdisciplinary collaboration	<i>Facilitate connections between management students and technological students as well as organise workshops with other universities to work on projects together.</i>
	extracurricular activities	<i>Majority of extracurricular activities e.g. workshops and competitions on entrepreneurship are in Polish.</i>
	student organizations	<i>Increase promotion of students' organisations to create more opportunities for students and share of PUT good name. Increasing budgets for academic circles and supervise any ideas that in the future may become profitable.</i>
<b>University-Business relationships for knowledge exchange</b>	business-science collaboration, projects and partnerships with industry	<i>By inviting business executives, CEO's to deliver lectures, make presentations and share their experience will be an enormous advantage for students in knowledge exchange with the industry. The PUT should establish permanent cooperation with enterprises so that students have the opportunity to attend some laboratories in a given enterprise.</i>
	partnerships with stakeholders	<i>The university has to demonstrate active involvement in partnerships and relationships with a wide range of stakeholders</i>
	developing commercial solutions with local business	<i>Give students more opportunities to put the concepts into action in a real firm to observe how they perform and what outcomes they provide.</i>
	organizing internships and apprenticeships	<i>It would be good to make apprenticeships more accessible for students by signing more deals with companies and maybe create new positions for mutual benefits. If the university can't provide professionals from different fields, students should have more practice in companies and internships.</i>
	trips to companies	<i>It would be beneficial for students to observe processes they learn about. Providing possibilities to visit companies and see how people work there, organise job fairs, where companies advertise themselves.</i>
<b>The internationalised institution</b>	strong international focus, international collaboration and partnerships, relationships with international companies	<i>The University should build more alliances with multinational companies. It can build strong connections with international companies and increase the number of internships programs for especially international students. Students need more events that encourage innovation and international cooperation.</i>
	support for foreign students	<i>There should be university ambassadors who should be international students. This way, international students will be exposed to all the happenings and where to get help from in the university.</i>

Source: own study based on empirical research (n = 112).

When assessing entrepreneurship education, students stated that the programs and teaching methods offered are in many cases traditional (teacher-centred) and not always responsive to the market needs what can constrain the development of an entrepreneurial mindset among

students. Moreover, they claimed that although PUT has an Academic Incubator, there are only a few examples of successful start-ups that have emerged from the University. This could be an indication of a lack of effective involvement or appropriate support to student needs. According to one of the respondents, *the University has a number of initiatives to support entrepreneurship and innovation, but these are often fragmented and not well-coordinated, which can make it difficult for students to access support and resources.* Another points out that *when it comes to entrepreneurial culture, it is still too conservative and risk-averse, which can be a barrier to entrepreneurship and innovation.*

The next challenging area is inadequate funding: PUT's budget for entrepreneurship-related programs and activities is modest. As a result, the organization's ability to support start-ups and build entrepreneurial community may be limited. This also applies to student organizations that receive too little financial support to be able to effectively develop their projects and verify the commercial potential of their solutions. Since the University's funding model relies on government subsidies, it can limit its ability to be flexible and responsive to the needs of the academic society. Therefore, there is a necessity to provide diversified sources of funding to meet the diverse needs of students and potential entrepreneurs. Moreover, the well-tailored programs could facilitate students, staff and faculty to establish links with business and the community, and benefit both innovation and performance. In addition, the students highlighted insufficient support in organizing internships and apprenticeships as very critical area. Usually, they have to find a company themselves and try to sign a cooperation agreement with the University. This involves a lot of formalities and lacks substantive support from University employees.

Another area requiring improvement is communication and promotion of activities in English. The study participants repeatedly emphasized the lack of or a limited access to various information in English. Announcements about competitions or workshops are usually published and conducted only in Polish, which automatically excludes the participation of foreign students. Even the e-learning platform (eCourses) that all students must use contains descriptions and instructions, and often even names of subjects only in Polish. This definitely hinders effective communication between academic teachers and students. As outlined in the reflective essays, students confirmed that advisory, educational and structural support significantly affects their satisfaction with the university's offer. Moreover, they emphasized the need for more practice-oriented entrepreneurship education as well as for a wide range of cooperation ranging from research projects, through consultancy, mentoring, funding and infrastructure services, to relations with business in the field of incubation. The foreign students are expecting significantly greater access to extensive networks of investors, mentors, and entrepreneurs, creating opportunities for students to learn from experienced professionals. Furthermore, they are interested in including extracurricular activities and non-traditional courses that encourage them to solve real business problems, envisage practical solutions and cooperate in interdisciplinary teams. These extracurricular activities could help them acquire

confidence and form enduring connections as they pursue their ambitions. Moreover, the University should encourage collaboration across different fields and departments, since interdisciplinary collaboration can lead to new ideas and useful solutions.

Undoubtedly, PUT is taking more and more actions, to encourage entrepreneurship and innovation, however, there are still areas where changes, improvements and new solutions can be implemented to move the University closer to become more entrepreneurial. Taking into account the students' reflections, several practical implications may be proposed, which can be implemented without major difficulties or challenges. The following recommendations outline some of these areas:

- Coordinating and consolidating the University's existing initiatives and incentives to make them more accessible and beneficial for both Polish and foreign students.
- Introducing more interdisciplinary and project-based teaching methods that encourage collaboration and real problem-solving approach.
- Promoting research collaborations across different faculties to foster interdisciplinary research and develop new ideas and solutions.
- Shifting the University's research focus more towards applied research relevant to industry and society to increase its impact.
- Strengthening the entrepreneurial culture among students by encouraging risk-taking activities and experimentation, as well as by celebrating and rewarding entrepreneurial success.
- Sharing promotional materials and conducting workshops and seminars on entrepreneurship in English to increase the access for all students.

It is also necessary to point out practical implications that require additional financial and human capital that may go beyond the current capabilities of the University, but may bring tangible benefits in the future. The following actions can be indicated here:

- Providing more substantive support and resources for students to pursue entrepreneurship and innovation, such as mentorship programs, seed funding and access to business and legal expertise.
- Inclusion of more extracurricular activities that benefit students with transversal skills.
- Expanding current industry partnerships to provide more opportunities for students to collaborate on real commercial projects.
- Establishing partnerships and collaborations with more local and international companies and investors to increase funding and support for entrepreneurial ventures and innovation at the University.
- Allocating more funds to entrepreneurship-related programs and activities in order to support start-ups and boosting the development of an entrepreneurial ecosystem.
- Engaging stakeholders and business partners in providing attractive work opportunities for students and alumni.

- Encouraging students (e.g. through competitions and public recognition by University authorities) to engage with the wider community and to use their expertise to address social and environmental challenges as a way of fostering an entrepreneurial mindset and contributing to society.
- Streamlining administrative structures and processes to make it easier for students to collaborate with industry and pursue entrepreneurial activities.
- Investing in infrastructure and facilities that support entrepreneurship and innovation, such as start-up incubator, makerspaces and prototyping labs.
- Developing a long-term strategy to become an entrepreneurial university with clear goals and metrics for success and continuous evaluation.

Summing up the research results, it should be emphasized that many activities are undertaken at PUT that fit into the concept of an entrepreneurial university, but there are still many areas that require a new, flexible approach to build entrepreneurial mindset and attitudes. It is necessary to constantly monitor and evaluate the actions taken in order to effectively respond to the needs of the academic community. Gaining a deeper understanding of HEIs' entrepreneurial activities and highlighting their internal potential could enhance effectiveness of the third mission delivery and offer valuable insights for other academic institutions focusing on entrepreneurial pathways and their impact on the society. Such insights could also help HEI leaders and department managers better understand how they can help both students and staff exploit entrepreneurial opportunities from their academic work and create added value for the whole community.

## 5. Conclusions

The qualitative exploratory research was conducted to analyse the perception of foreign students about entrepreneurial activities and incentives provided to them during their master study at the Poznan University of Technology to identify the main challenges of an entrepreneurial university. Therefore, the study highlights the initiatives needed to stimulate and support ambitious entrepreneurship within the academic community and beyond. In addition, the explicit focus is on areas which require improvement to fit into the concept of an entrepreneurial university based on feedback from students' reflections. Due to the fact that universities operate in specific socio-economic and cultural conditions, in a specific business environment, the described entrepreneurial activities may be a challenge for objective comparison and evaluation.

Based on observations and the reflective essays it can be stated that students are expecting a balance of practical experience and theoretical issues to encourage them to adopt a wide range of substantive knowledge about entrepreneurship. The critical remarks formulated by the



respondents are crucial for improving the practical approach and the effectiveness of future entrepreneurial initiatives. Referring to their opinions, PUT has a great potential to develop towards an entrepreneurial university by introducing some changes, improvements or even new solutions. Students indicated several areas where adjustments and “a fresh approach” could be introduced to support the transformation of the University into an entrepreneurial one.

Great emphasis was also placed on the need for high flexibility of the University in its response to the market requirements. The study participant claimed, that an entrepreneurial university should place a strong emphasis on providing students with hands-on, real-world experiences and help them acquire the skills and knowledge needed to both succeed in the business world and have a positive impact on the environment. Therefore, Poznan University of Technology may develop metrics to track the success of its entrepreneurial initiatives and use them to evaluate and improve its programs on an ongoing basis. Nowadays, a crucial challenge of the higher educational system is to create favourable preconditions to prepare students for the changing and demanding business world.

Despite progress in recognising the popularity of case studies explaining the entrepreneurial university framework, the literature still lacks commonly recognized and systematic means of evaluating and measuring this phenomena. Therefore, it is advisable to develop measurable indicators that will allow for an objective comparison of activities and achievements of the examined cases.

Although the presented results are not representative, they can illustrate entrepreneurial attitudes among the PUT’s international students and their real opinions about the adjustment to the concept of an entrepreneurial university. As previously mentioned, the findings presented in the paper are very preliminary and further investigation in this field is required using i.e. comparative case studies involving also Polish students to obtain a deeper insight into the research problem.

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