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The Social Third Mission of Universities: Towards a Unified Framework

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Abstract

Universities, traditionally known for their primary roles in teaching and research, have expanded their mission to encompass activities aimed at contributing to the economic and social development of the regions in which they operate. This additional focus is known as the Third Mission of universities. While the economic contributions of universities through knowledge transfer and university-industry collaboration are well-established, the social impact of the Third Mission remains a complex and ambiguous concept. Universities are expected to create social impact without clear guidance as to what are the mechanisms they can apply to do so. Consequently, the interpretation and implementation of the social aspect of the Third Mission vary among universities, and some institutions may not engage in it at all. This study provides a timely and comprehensive overview of the existing literature on the diverse mechanisms employed by universities to engage with society and create social impact. We utilize a combination of descriptive analysis and systematic literature review of 112 peer-reviewed articles to identify embedded and emerging Third Mission activities, clustered within the domains of Responsible Education, Knowledge Transfer, and Co-creation. Given the pressing societal and environmental issues we are facing, our study has important implications for universities and policymakers, as we propose a transformative framework for inclusive development for an expanded understanding of the Third Mission of universities and how it can be used to create and increase social impact.

Keywords: Universities, sustainability, social entrepreneurship, social third mission, literature review

JEL: I2; L3; O3

Introduction

In addition to their primary missions of teaching and research, universities are increasingly engaging in activities that

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contribute to the economic and social development of the regions in which they operate (Laredo, 2007; Sánchez-Barrioluengo & Benneworth, 2019). In the relevant literature this additional focus is known as the Third Mission (TM) of universities (Montesinos et al., 2008b; Nelles & Vorley, 2010). The role of universities in contributing to economic growth has been well defined in terms of transferring knowledge and technologies (Clark, 1998; Guerrero, Urbano, & Fayolle, 2016; Rasmussen & Wright, 2015) through university-industry collaboration (Bastos et al., 2021; Etzkowitz, 2004). The Third Mission has become synonymous with science commercialization in an entrepreneurial setting (Urbano & Guerrero, 2013). The TM is however not restricted to commercialized scientific research, but is a process of regional regeneration and interactive support to the surrounding community (Compagnucci & Spigarelli, 2020a). This regional embeddedness warrants outcomes other than the financial to include social and environmental impact (Breznitz and Feldman, 2012; E. Carayannis & Campbell, 2013; Moussa et al., 2019). Universities can potentially converge between realizing both economic and social contribution, through different pathways and intervention points (Klofsten et al., 2019; Trencher et al., 2014a; Wagner et al., 2021).

Despite the widespread recognition of the social impact of the Third Mission, the concept remains ambiguous and lacks critical reflection (Compagnucci and Spigarelli, 2020). Universities are expected to create social impact without clear guidance as to what are the mechanisms they can apply to do so (Bazan *et al.*, 2020; Benneworth *et al.*, 2016). The social aspect of the TM is thus interpreted and implemented differently by universities, if at all (Fichter and Tiemann, 2018; Klofsten *et al.*, 2019; Siegel and Wright, 2015). Good examples in the literature remain anecdotal and rely on case studies of best practices in well developed economies (Kitagawa et al., 2016). We hereby concur with the call of Compagnucci and Spigarelli (2020, p.20) who draw the attention to more inclusive research:

> *"Interesting approaches should all be observed and considered, and mutual learning could be fruitful in the attempt to maximise the impact of the TM. Data collection should also include information on continuing education, entrepreneurship education and societal engagement, along the different dimensions of innovation and not limited to technological ones.*

The purpose of this study is to map and analyze the existing literature on the various mechanisms for societal engagement applied by universities in pursuit of social impact. Due to the vastness of the topic and its transcendency among disciplines we achieve this by combining descriptive analysis and systematic literature review (SLR) ((Tranfield et al., 2003a)Donthu *et al.*, 2021). Given the complexity and heterogeneity of the evolving phenomenon of the TM, this SLR is very timely and provides a useful analysis (Compagnucci and Spigarelli, 2020). We thoroughly review 112 relevant papers on societal engagement activities by universities as found in Scopus and Web of Sciences databases. Our search encompasses the period of 1996 to 2022. In our expanded framework we find both embedded and emerging TM activities. Our study has important implications for universities and policymakers, as we propose a transformative framework of innovation

for inclusive development for an expanded understanding of HEIs own TMs (Kruss & Gastrow, 2017).

This paper is structured as follows: we start with reviewing the terms used in this literature review on the Third Mission activities of universities. We then discuss the methodology behind this study and the inclusion and exclusion criteria for the papers in the review. The following chapter focuses on major findings of the descriptive analysis, as well as content analysis of the systematic literature review. In the conclusions section we summarize our findings and present a systematic framework on the state of the art of the Social Third Mission of universities, as well as draw conclusions and future research directions.

The Third Mission of Universities

This section briefly discusses the terms used for this systematic literature review (Bacq & Hertel, 2022). The role of the university is constantly evolving (E. Carayannis & Campbell, 2013; Etzkowitz & Klofsten, 2005). The Third Mission of the university goes beyond its traditional missions of teaching and research to contribute to society both socially and economically (Laredo, 2007; Montesinos et al., 2008a; Vorley & Nelles, 2008). The economic aspect of the Third Mission of higher education institutions (HEIs) has been widely discussed in the literature, in terms of technology transfer of intellectual property (Debackere & Veugelers, 2005; Hayter, 2016) to the industry (Bastos et al., 2021; Etzkowitz & Zhou, 2017) in an entrepreneurial setting (Etzkowitz & Leydesdorff, 2000; Clark, 1998; Guerrero *et al.*, 2016). The term Third Mission has become synonymous with university entrepreneurship and science commercialization through technology transfer (Feldman et al., 2022; Urbano & Guerrero, 2013).

University Entrepreneurship

Universities increasingly stimulate academics, students and staff to explore and exploit ideas that could be transformed into entrepreneurial initiatives, with a focus on monetizing technology transfer and intellectual property (Bramwell & Wolfe, 2008; Clark, 1998; Etzkowitz, 2004; Guerrero, Urbano, Fayolle, et al., 2016; Kirby, 2006). These initiatives traditionally involve creating spin-off companies resulting from research (Clarysse et al., 2011; Rasmussen et al., 2014), collaboration with industry and government (Carayannis and Grigoroudis, 2016; Carayannis and Campbell, 2019), and science commercialization (Walter et al., 2016). The Third Mission outputs have thus been focused on patents produced, spin-offs created, and projects in collaboration with industry (Bercovitz and Feldman, 2008; Clayton et al., 2021; Link and Siegel, 2009; Perkmann et al., 2015). Research has proven that university entrepreneurship is an important driver of regional development (Etzkowitz & Klofsten, 2005; Kirby et al., 2011; Pugh et al., 2022).

Some authors have positioned the university as crucial in spurring and supporting entrepreneurship beyond the walls of the university, with its knowledge, resources, networks (Bloom & Smith, 2010; Malecki, 2018; Roundy et al., 2018; Smith & Woodworth, 2012). Kirby, (2006) and Cunha *et al.*, (2015), argue that universities support entrepreneurs by means of modern facilities and access to financial resources. Supporting social entrepreneurship is another way for HEIs to create social impact (Gonzalez &

Dentchev, 2022). This support is crucial as social entrepreneurs fight poverty (Bloom, 2009; Ghauri et al., 2014), empower women (Bacq & Janssen, 2011; Datta & Gailey, 2012), foster inclusive growth (Alvord et al., 2004; Azmat et al., 2015), and generate institutional change (Nicholls, 2013; Volkmann et al., 2008). The importance of supporting sustainable entrepreneurship and eco-preneurs in finding solutions to fundamental challenges such as climate change, biodiversity loss and water scarcity through innovation and new firm creation has also been emphasized in the literature (Brundiers et al., 2010; Dean & McMullen, 2007; Dentchev et al., 2016; Fichter & Tiemann, 2018; Schaefer et al., 2015; Tiba et al., 2021; Zahra et al., 2022). With the impeding climate crisis, authors are calling for a shift to a sustainable university (Cai & Ahmad, 2023; Trencher et al., 2014b) to reflect the need of integrating a sustainability oriented mindset throughout all missions of the university.

Technology Transfer

Technology transfer has been considered in the literature in terms of individual and organizational antecedents, types of technology transfer, productivity of TTOs, personal characteristics of academics engaged in the process, effectiveness of university-industry collaborations (Cunningham et al., 2019; Ismail & Ajagbe, 2013; Mascarenhas et al., 2019). Thus the third mission activities of universities have mainly been presented in that context. Bozeman, (2000), classifies the profound literature on technology transfer in an elaborate Contingent Effectiveness Model summarizing the impacts of technology transfer in terms of who is doing the transfer, how they are doing it, what is being transferred and to whom:

- Transfer agent - The institution or organization seeking to transfer the technology, e.g., the university: students
- Transfer media - The vehicle, formal or informal by which the technology is transferred, e.g., license, copyright: university-community collaborations; consulting from students; consulting from faculty members
- Transfer object - The content and form of what is transferred, the transfer entity, e.g., Scientific knowledge, technological device: knowledge, know-how, student led startups,
- Transfer recipient - The organization or institution receiving the transfer object, e.g., firm, agency, organization, consumer, informal group: social entrepreneurs, eco-preneurs, SMEs, NGOs
- Demand environment - Factors (market and non-market) environment pertaining to the need for transferred object, e.g., price for technology, substitutability, relation to technologies now used.

Considering the TM through the lens of technology transfer, as has been the predominant focus in the literature, omits some important non-profit aspects of university societal outreach. These activities are gaining significant importance and are the focus of this literature review (Montesinos et al., 2008c; Trencher et al., 2014b). We refer to them as the Social Third Mission of universities from here on as coined by (Montesinos et al. (2008d)

Methodology

Given the large amount of data, intersecting among multiple disciplines, we have decided to perform a bibliometric analysis and map the existing research on approaches undertaken by universities towards their Social Third Mission (Compagnucci and Spigarelli, 2020a; Atkinson and Cipriani, 2018). Bibliometric analysis allows the encompassing and systemizing of larger amount of data from various fields (Aria & Cuccurullo, 2017). Bibliometric analysis is a useful tool in literature synthesis as we are targeting to map the research field without subjective bias (Zhu & Hua, 2017). In line with our research aim and contribution aspiration towards building an integrated framework, this methodology facilitates the mapping of current research and identifies further research agenda (Donthu et al., 2020). R software and the Biblioshiny package have been used for the purpose of the bibliometric analysis (Guleria & Kaur, 2021). In this study, we apply co-word analysis on titles, author keywords and abstracts, as well as a simple bibliometric analysis on the same so to reveal the main contributors in the field, the sources with evidence and a clear orientation to explore the topic (Pritchard, 1969). Factorial and contextual analysis and correlations are applied to reveal under-researched topics and potentially to formulate clear clusters of knowledge and further development of a framework and research agenda (Bastos *et al.*, 2021; Chandra, 2018).

In addition, we perform a systematic literature review with content analysis (Tranfield et al., 2003b) to get immersed in the data and propose a framework inducted from the literature on the social outreach activities of universities (Chew, 2021). The originality of this paper lies in the exhaustive list of keywords search hence the comprehensive framework to understand the rich spectrum of the social element of the third mission of higher education institutions (Kraus et al., 2022). The Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement has been utilized for the conduct and reporting of this analysis (Moher et al., 2009; Page et al., 2021).

In order to identify an exhaustive set of studies representing the social outreach activities of universities, we conducted a keyword search within two leading scientific databases – Scopus and Web of Science (Aria et al., 2020; Meho & Rogers, 2008; Zhu & Liu, 2020). This expanded search allows for covering more grounds on the topic (Bacq et al., 2021). The selection of keywords has been carried out throughout the year 2022, with numerous iterations and feedback from prominent scholars. A first iteration was presented at the New Business Models Doctoral Consortium and Conference in Rome, Italy in June, 2022. As a result, the search string has been significantly expanded and refined. Additionally, this paper was discussed at the Academy of Management Review Paper Development Workshop in Warsaw, Poland in July, 2022, resulting in an improved theoretical contribution. Figure 1 illustrates the article search process guiding this literature review (Bacq & Hertel, 2022). More detailed data on keyword search string is provided in Appendix A.

Article Search in Scopus/ Web of Science

The final list of approved articles contain some form of Third Mission social outreach activity**.** All articles out of the scope of the Social Third Mission were excluded, as well as ones which did not explain the role of

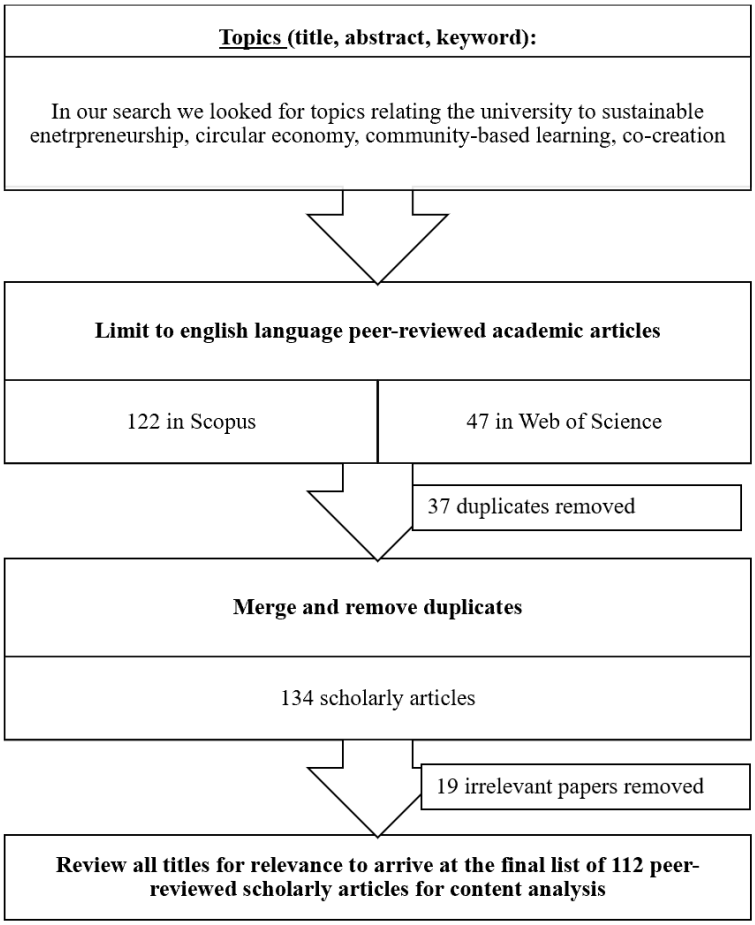

Figure 1. Article search process

the university in the various social outreach activities. All articles solely dealing with the economic aspect of TM activities have also been excluded. Decisions on inclusion and exclusion were made by the first author based on the content of the article title and abstract and whether it concerned the social aspect of the TM. In case of doubt, decision was discussed with the second author to reach a consensus as to which articles should be included in the final set.

Coding and analysis procedure

The final sample of 112 accepted articles was logged in an Excel workbook, recording the following information: Journal, Title, Year of publication, Methodology, Author name(s), Abstract. Every article was read in depth and coded manually by the first author. In addition, we made sure to check for intercoder reliability by having the second author code 17% of the 112 final selected papers. This resulted in 89% of papers being coded in the same way as the first author, which shows consistency and reliability of coding (Lombard et al., 2002).

An inductive approach was used to code the data (Braun & Clarke, 2006; Kalaa et al., 2005). Following Strauss and Corbin's (1998) approach, the coding involved categorizing codes from specific to the general themes. Second-order coding was then employed to identify specific patterns and trends within the data for in-depth analysis. This SLR also utilized a hybrid approach (Fereday & Muir-Cochrane, 2006; Lungu, 2022) to coding in addition to the inductive analysis (Boyatzis, 1998). In the coding process we were looking through the lens of the technology transfer framework by (Bozeman, 2000). This allowed to look for additional emerging themes within the pre-defined categories. Numerous discussions between the authors led to the final codes of reference, resulting in three major clusters, discussed in the Findings section.

Findings

Descriptive Analysis

This section presents the bibliometric analyses based on the final search results – 112 peer-reviewed scholarly articles.

Recent years have shown a spike in the intersection between universities and STM activities. This coincides with the increased pressure toward universities to engage in TM activities beyond science commercialization (Barth et al., 2007; Göransson et al., 2009; Laredo, 2007). Social impact has become crucial for universities and recent years have seen increased attention to the different pathways through which this impact is created or co-created (Compagnucci & Spigarelli, 2020a; Feldman et al., 2019; Thune et al., 2016; Wagner et al., 2021).

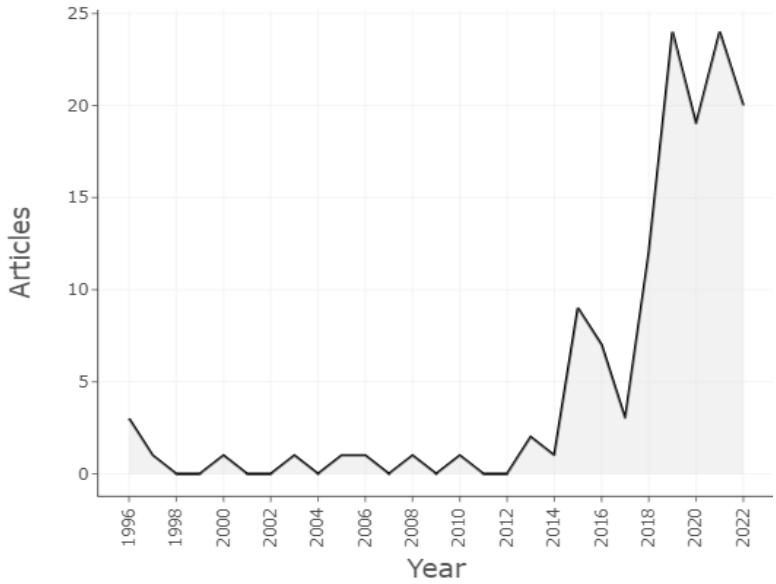

Figure 2. Articles

Table 1. Most relevant sources

Sources	Articles
SUSTAINABILITY	13
JOURNAL OF CLEANER PRODUCTION	7
INTERNATIONAL JOURNAL OF SUSTAINABILITY IN HIGHER EDUCATION	4
MENTORING AND TUTORING: PARTNERSHIP IN LEARNING	4
STUDIES IN HIGHER EDUCATION	4
EDUCATION AND TRAINING	3
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	3
EUROPEAN JOURNAL OF HIGHER EDUCATION	2
HIGHER EDUCATION POLICY	2
HIGHER EDUCATION, SKILLS AND WORK-BASED LEARNING	2

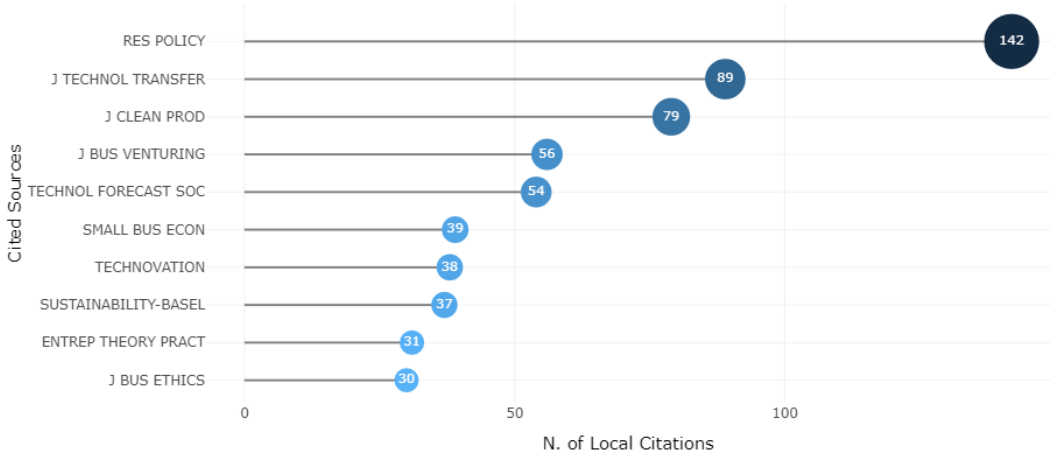

Figure 3. Cited Sources

Table 1 shows the 10 most relevant sources, taking into account a number of articles on the topic, in combination with a number of citations (Donthu et al., 2021). Contributions on the engaged university are significantly less than those on the entrepreneurial university and are seldom featured in high ranking journals (Clauss et al., 2018). However, the high-ranking Journal of Cleaner Production and Technological Forecasting and Social Change have published important literature reviews which shed light on the rich components of the TM beyond the economic impact. This helped legitimize the social aspect of TM and spur additional research in the area as authors have decided to pursue the future research avenues stated in these articles.

The topic has caught the attention of high-ranking academic journals outside of the higher education field. Those prominent journals also account for the biggest number of citations gathered.

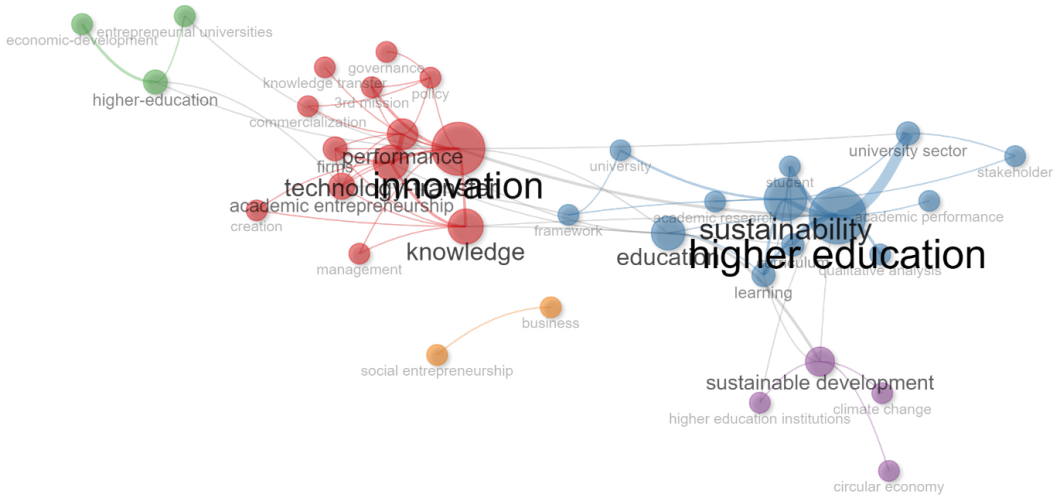

Figure 4. Keyword Correlation

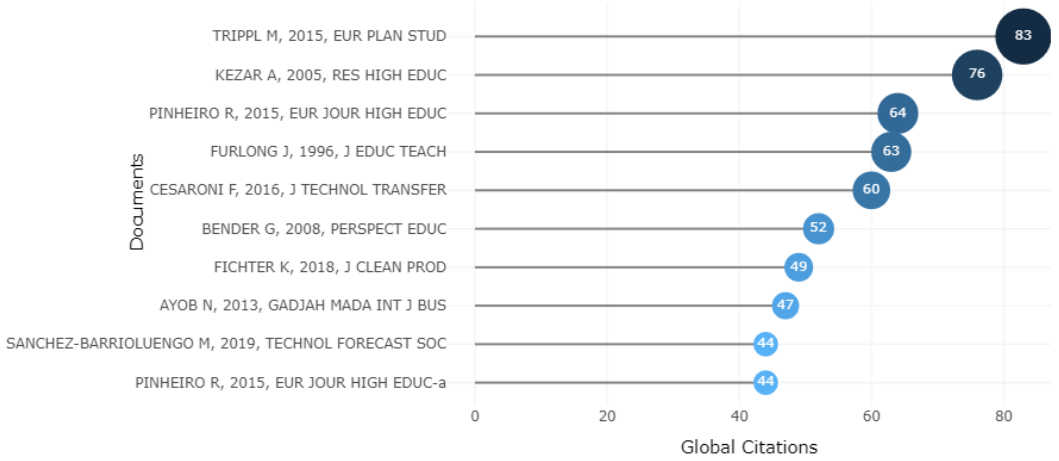

Figure 5. Most Cited Documents

Authors have been collaborating on several major topics, including social entrepreneurship, academic entrepreneurship, innovation, sustainability and sustainable development. Third Mission has mainly been associated with knowledge transfer, commercialization and academic entrepreneurship, while being discussed in the framework of the entrepreneurial university's impact on economic development. The majority of collaborations have occurred after 2015 with the most cited paper by Trippl M et al., concerning the role of universities in regional development. This paper is followed by Kezar's "Redesigning for collaboration within higher education institutions: An exploration into the developmental process" from 2005 which sets the stage for the central position of the university in driving collaborations for economic and social development. Hence other most cited papers talk about best

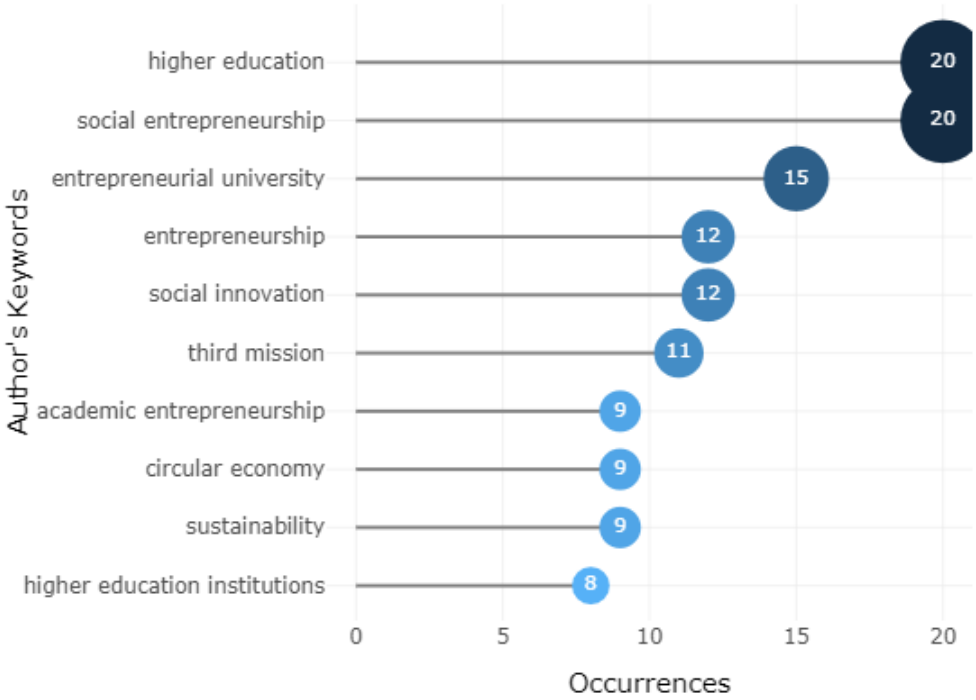

Figure 6. Authors' Keywords

practices in introducing Third Mission and sustainability initiatives at universities:

Among author's keywords, the most common pathway towards societal impact created by universities is social entrepreneurship. The bigram is most often mentioned together with higher education. Within the topic, the most immediate way to drive sustainability through universities is through education. Entrepreneurial university is mentioned second, and literature mostly discusses the economic impact of the EE with a mention of its side effect towards society. Entrepreneurship and academic entrepreneurship as well here account for the additional social impact achieved by universities in their efforts to increase entrepreneurial mindset and industry collaboration. Circular economy and sustainability have recently started to harness attention in the literature as key pathways in creating societal impact. However, here as well the topic is limited to how to create sustainable and circular campuses and universities, rather than how universities can create or support those initiatives outside of the campus.

The evolution of terminology used shows the shift from social responsibility of the university to more green topics like circular economy and sustainable development. This is in line with UN's 17 SDG promotion and adoption in many universities of a strategic plan on how to achieve the SDGs (Clarke and Crane, 2018; Craveiro, Carvalho and Ferrinho, 2020; Tiba, van Rijnsoever and Hekkert, 2021;

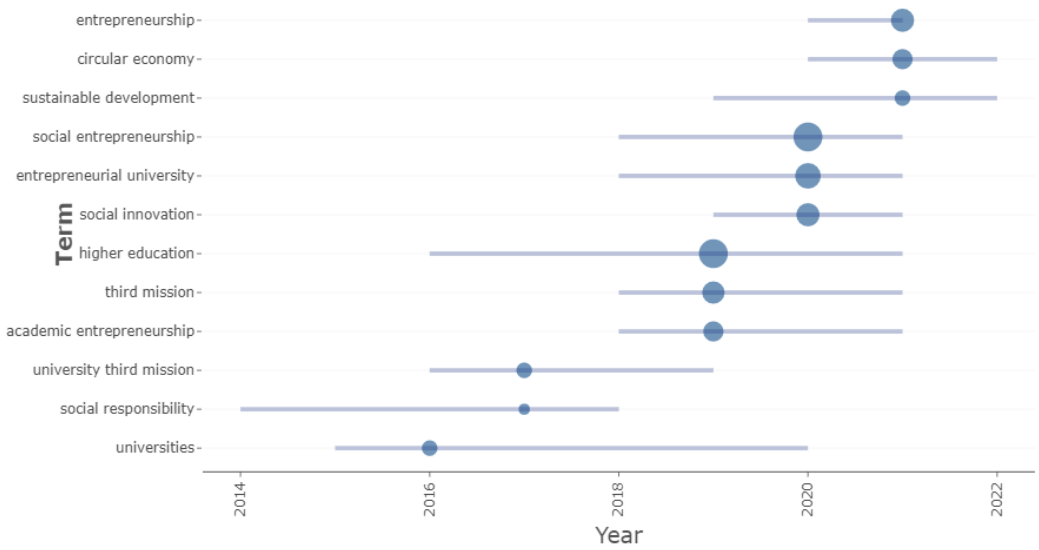

Figure 7. Keywords Evolution

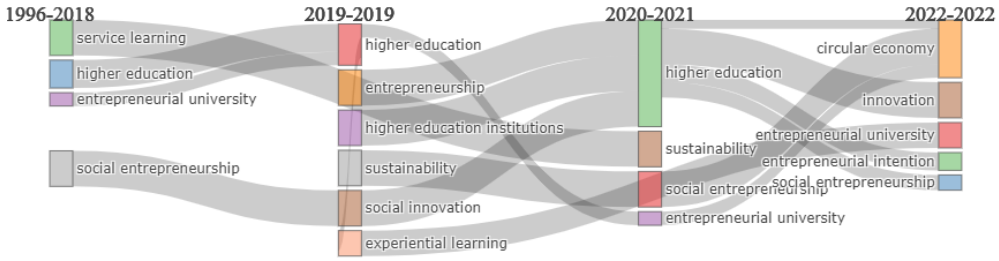

Figure 8. Keywords Evolution 2

Lepik and Urmanavičienė, 2022). Given the grave environmental challenges and wicked problem we are facing, universities are key stakeholders in addressing those challenges. Therefore, the focus is now shifting towards how to transform universities into sustainable organizations, how to increase the educational offering in the area of sustainability but also how to increase research in the area. University thirds mission has been widely discussed in the literature since 2016 however with little attention to the societal impact universities can help create. With the vagueness of the concept come also the different interpretation every university has of those activities which represent anything beyond teaching and research, the primary university missions (Gaisch et al., 2019). Depending on their infrastructure, resources, knowledge and strategy, different universities will apply different strategies to creating social and economic impact. A number of authors have expressed concern with assuming the homogeneity of universities and applying the one size fits all principle when adopting the third mission.

Social entrepreneurship has consistently been mentioned in the literature since 1996 as a pathway for universities in creating societal impact. Service-learning topics are becoming more oriented towards experiential learning and the exploration of entrepreneurial intention.

Content Analysis

Despite the ambiguity of TM, there is a general agreement that TM is the relationship between universities and stakeholders from the non-academic world, concerned with the generation, use, application and exploitation of university knowledge, capabilities and resources, outside of the academic environment (Compagnucci and Spigarelli, 2020a; Vorley and Nelles, 2008; Zawdie, 2010; Montesinos *et al.*, 2008a). Scholars unanimously agree that academia, industry, government and civil society partnerships are crucial for tackling sustainability challenges (De Silva et al., 2023; Linton & Hasche, 2021; Miller et al., 2014; Pel et al., 2020; Rinaldi et al., 2022; Trencher et al., 2014b). Universities can be a powerful actor in creating social and environmental impact with their infrastructure, knowledge, research, expertise, student and faculty body, connections, embeddedness within the region and its community (Carayannis and Campbell, 2013; Cunningham *et al.*, 2018; Klofsten *et al.*, 2019).

We systemize the mechanisms for creating this impact as found in the literature through the major dimensions of technology transfer (Bozeman, 2000): who is doing the transfer, how they are doing it, what is being transferred and to whom. We find that the demand environment driving the technology transfer demand from the original model is the pressure towards adopting sustainability practices and engaging in activities to contribute to society:

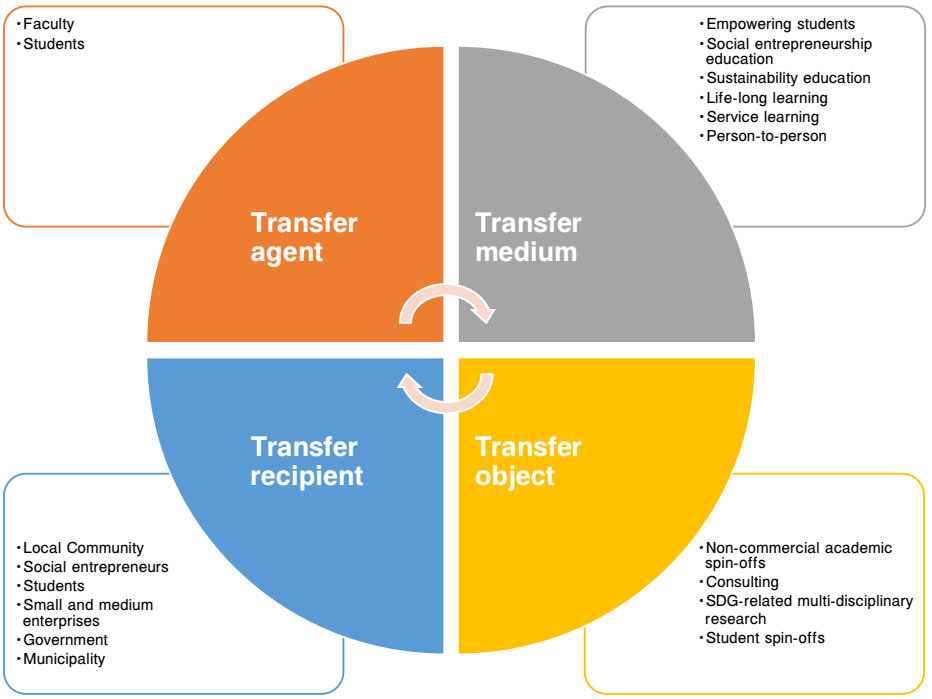

Figure 9. Mechanisms of the TM for creating social and environmental impact

Within the domains we find that in order to increase the social aspect of their Third Mission, universities have mostly resorted to their primary missions of education and knowledge transfer. The transfer medium has seen an increasing shift in responsible education not only within the classroom, but also within the community. Research projects have been mentioned in the literature, however there is significantly a smaller number of peer-reviewed papers on the topic. Education and intent-creation remains the leading topic of papers. As for the transfer object, what is distinct about the Social Third Mission are the social/sustainable entrepreneur spin-offs, coming out of university. Those can be both student and/or academic led and constitute non-commercial forms of spin-offs, whose main purpose is to create social value.

An emerging trend, however, is the role of the university as an orchestrator of resources and ecosystem builder for sustainability. In that regard, the technology transfer process, which has thus far been recognized as a unidirectional one, is becoming more open to co-creation between multiple parties. Within the transfer medium and object, we find the following interesting approaches to societal engagement:

Responsible education

- **Social Entrepreneurship and Sustainability education** – Said et al., 2015; Fonseca et al., 2018; Gagnidze, 2018; Solomon, 2019; Rodríguez-López & Souto, 2019; Deets et al., 2020; García-Morales et al., 2020; Orozco-Messana et al., 2020; Niska, 2021; Kripa et al., 2021; Morland et al., 2021; Onpraphai et al., 2021; Garcia-Gonzalez & Ramirez-Montoya, 2021; Sharov et al., 2021; Janssens et al., 2021; Davidavičienė & Raudeliūnienė, 2021; Nicotra et al., 2021; Rickhoff-Fischer et al., 2021; Matthias et al., 2022; Obrechta, 2022; Naqvi et al., 2022; Kwong et al., 2022; Noorseha et al., 2013; Othman & Wahid, 2014; Paolo et al., 2018; Bartha, 2019; Rozar et al., 2020; Agu, 2021; Cunha et al., 2022; Chavali et al., 2022;
- **Community-based learning** - Dorasamy & Pillay, 2010; Hardwick, 2013; Ndateba et al., 2015; Lake et al., 2016; Abdul et al., 2017; Brown & Warwick, 2019; Smith-Tolken & McKay, 2019; VanLeeuwen et al., 2020; Rampasso et al., 2021; Sánchez-Carracedo & López, 2021; Lake et al., 2022;
- **Community engagement** – Bender, 2008; Moraa et al, 2015; Pinheiro et al., 2015; Trippl et al., 2015; Romulo & Barrioluengo, 2016; Thune et al., 2016; Kitagawa et al., 2016; Chantler, 2016; Thomsen at al., 2018; Shephard, 2018; Crazy Bull & White Hat, 2019; Gusheh et al., 2019; della Volpe & Esposito, 2020; Rampasso et al., 2021; Monteiro et al., 2021; Unceta et al., 2021; Mancini et al., 2022; Pelagallo et al., 2021;

Knowledge transfer

- **Non-commercial Academic entrepreneurship** –Sooampon & Igel, 2014; Cesaroni & Piccaluga, 2016; Mariani, 2017; Sliva & Hoefer, 2016; Sooampon, 2018; Meoli et al., 2018; Wong et al., 2019; Donatiello & Gherardini, 2019; Degl'Innocenti et al., 2019; Korf et al., 2019; Franco-Leal & Camelo-Ordaz, 2020; Franco-Leal et al., 2020; Amryab et al., 2021; Roncancio-Marin et al., 2022
- **University-Industry Collaborations/Quadruple helix** - Kezar, 2005; Bărbulescu &Constantin, 2019; Gaisch et al.; 2019; Centobellia et al., 2019; della Volpe & Esposito, 2020; Cruz-Amarán et al., 2020; Morland et al., 2021; Etzkowitz, 2022; Korf et al., 2019; Davidavičienė & Raudeliūnienė, 2021; Johnston et al., 2021; Salomaa & Charles, 2021; Rickhoff-Fischer et al., 2021; Matthias et al., 2022;
- **Social Innovation** – Rivers et al., 2015; Wong et al., 2019; Franco-Leal et al., 2020; Thomas & Pugh, 2020; Kripa et al., 2021; Monteiro et al., 2021; Pelagallo et al., 2021; Unceta et al., 2021; Lake et al., 2022; Cunha et al., 2022;
- **Bridging organizations** - van Winden et al., 2019; Cadorin et al., 2019; Sansone et al., 2020; Baycan & Olcay, 2021; Matthias et al., 2022;

Co-creation

- **Entrepreneurial Universities as Engaged/Sustainable Universities** - Ramos-Monge et al., 2019; Sánchez-Barrioluengo & Benneworth, 2019; Centobelli, 2019; Moussa et al., 2019; Betts &Santoro, 2019; Blankesteijn et al., 2019; Fichter &Tiemann, 2018; Thomas & Pugh, 2020; Cai & Ahmad, 2021; Etzkowitz, 2022; Pugh et al., 2022
- **Co-creation with students** – Wijnker et al., 2015; Sánchez-Hernández & Mainardes, 2016; Thomsen at al., 2018; Bărbulescu &Constantin, 2019; Williams & Powell, 2019; Deets et al., 2020; Magni & Pezzi, 2020; Bugallo-Rodríguez & Vega-Marcote, 2020
- **Circular economy** – Manuel et al., 2019; Manuel et al., 2019; Bugallo-Rodríguez & Vega-Marcote, 2020; Owojori et al., 2020; Nolasco et al., 2020; Janssens et al., 2021; Sánchez-Carracedo & López, 2021;
- **Ecosystem building** – Stephenson & Zanotti, 2019; Spatariu et al., 2021; Nicotra et al., 2021; Diaz-Gonzalez & Dentchev, 2022; Rinaldia et al., 2022; Wei, 2022; Kwong et al., 2022

Responsible education

Earlier studies have mainly focused on mapping social entrepreneurship education studies in different contexts, such as Malaysia, Portugal, Ukraine, Oman, the US and Canada. Others have examined the role of sustainability education in driving sustainable development. A shift is observed from purely entrepreneurship educational programs to ones adopting social entrepreneurship and sustainability at their core. Recent papers point to a need for better cooperation between businesses and higher education institutions to prepare skilful corporate social entrepreneurs (Davidavičienė & Raudeliūnienė, 2021; Rickhoff-Fischer et al., 2021). Although in its infancy in some contexts – in their content analysis Obrecht et al., (2022) find that 90% of study programs integrate at least 1 environmental sustainability subject, however 43.2% of programs have relatively low integration of environmental topics. Programs for responsible education are beginning to focus on sustainable development, circular economy, social innovation and the more holistic systems thinking (Kripa et al., 2021; Unceta et al., 2021). Janssens et al. (2021) find that transversal competences and valorization competences are equally important as technical competences for a circular economy (Orozco-Messana et al., 2020). Life-long learning programs are an important pathway through which universities instil social entrepreneurship practices within learners outside of the university (Mora et al., 2015; Thomsen et al., 2018).

Onpraphai et al., (2021) look at case studies involving international multidisciplinary programs for sustainability education which are co-created by students, faculty and the community. Research in recent years is shifting to an ecosystem perspective to education where all stakeholders are considered and are participating and where students and community are centered at the heart of the learning process. The latter manifests in a growing interest in the well-established community-based learning practices.

Service and community-based learning (CBL) –Universities have long been implementing service and community-based learning initiatives where students work on projects that address community needs. This approach allows students to apply their knowledge and skills to real-world problems while collaborating with community organizations. Several case studies in this SLR have identified the positive impact CBL has on both students and the local community. In their study, (Smith-Tolken & McKay, 2019) find that although service learning (SL) was used as a basis for teaching/learning strategy, many respondents felt they did not practice SL as the latter was experienced as prescriptive and not always applicable in its entirety. Community-engaged teaching and learning (CETL) evolved as an inclusive concept that encompasses multiple pedagogies that strengthen the notion of engaged teaching and engaged research as engaged scholarship. Recent studies have focused on the implementation of CBL and the type of context where CBL practices are adopted, e.g., among Kenyan students. Context-specific research on CBL is important as the success of any type of collaboration with the local community would be highly dependent on understanding its specifics and the local embeddedness.

Community engagement – Based on their local embeddedness, universities focus on building collaborative work with their communities by using various contextual elements such as values, external pressure,

learning, and networks. They aim to convince members of the campus about the importance and benefits of collaboration. In her paper on conceptual frameworks for collaboration in South Africa, Bender, (2008) presents a cross-cutting silo, intersecting and infusing between teaching, research and community engagement. Her analysis of community engagement (curricular and research-related and non-curricular) contributes to the notion that engagement is fundamentally dynamic based on partnership and it occurs at multiple levels of higher education institutions and in multiple sites in and over time. In the words of Brukhardt et al. (2004, p. 9): "Partnerships are the currency of engagement – the medium of exchange between university and community and the measurement of an institution's level of commitment to working collaboratively".

Still, the broadness of the term hampers the ability to measure and validate engagement, even among the most dedicated scholars, and there are various approaches to it (Shephard et al., 2018). Institutional support is a leading prerequisite to stimulating engaged scholars and their work with and for the community. In their case study (Gusheh et al., 2019) show the impact framework which is possible when the entire institution is working towards creating positive change, based on what is available in resources, knowledge and infrastructure. Another case study based on the "Socially Engaged Universities—(SEU)" project, co-funded by the Erasmus+ Programme 2014–2020, underlines community-university partnership (Mancini et al., 2022). Authors contend project sustainability can be achieved building and enhancing trusting relationships between the universities and their communities, and through creating mutually beneficial opportunities that empower students to make a societal difference. For these partnerships to succeed, two aspects are crucial - the ability to provide stable relationships over time and tangible results.

Knowledge transfer

Non-commercial Academic entrepreneurship/ Inclusive knowledge transfer

Academics are increasingly engaging in non-commercial forms of entrepreneurship, inspired by the gravity of social problems (Donatiello & Gherardini, 2019). Those could range from solving problem within the university, such as attracting and training young talent in Italy, to starting a social academic enterprise in Thailand (Sooampon, 2018). Sooampon & Igel, (2014) further observe local demand, stakeholders' force for collective impact, interdisciplinary expertise, external support and personal characteristics as key drivers in entrepreneurial researchers. With their multiplier tool, Mariani et al., (2018) measure the significant positive impact of technology transfer investments on academic spin-offs, leading to regional development and intellectual capital in the region. Additionally, the authors remark that in the long term, these investments can enrich entrepreneurial mindsets, a crucial steppingstone to sustainable entrepreneurship. Public policies and funding have long been designed to stimulate academic spin-offs, yet Meoli et al., (2018) find that the rate of creation of academic spinoffs increases in regions with higher skilled unemployment and in universities with fewer academic career opportunities, rather than in more research-oriented or more prestigious universities. At the intersection of community engagement, community-university partnerships and academic entrepreneurship, scholars find the emerging themes of the social orientation of academic entrepreneurs (Franco-Leal et al.,

2020; Roncancio et al., 2021; Wong et al., 2019). Authors demonstrate how universities capitalise on their technological competencies and academic programmes to support graduates and researchers in venturing into social entrepreneurship.

In their cluster analysis Cesaroni & Piccaluga, (2016) observe three different models of organization of knowledge transfer activities in Italian universities: research is the predominant activity in the first model, in line with the recommendations of universities' ''second mission'', a balance between research and KT characterizes the third model, whose universities seem more prone to follow the prescriptions of the ''academic engagement''. Cluster 2 represents an intermediate (and maybe temporary) model in this respect. The adoption of a more balanced approach of academic engagement is also a matter of strategic institutional intention hence authors contend that only when university managers stop considering KT as a remunerative means of valorization of research outcomes, its full potential can be exploited. In fact, the engagement with industry has proven to have a positive relationship on university research quality (Degl'Innocenti et al., 2019). Amry et al., (2021) propose the introduction of societal-based innovation as a legitimate university technology transfer mechanism for demonstrating contribution to socio-economic development agendas by explicitly recognising the 'social value' of all types of university research not just patentable science and technology based.

University-Industry Collaborations/ Quadruple helix - Universities collaborate with industries and engage in entrepreneurial activities. They establish and maintain relationships with industrial partners, including smaller-sized partners, to create mutually beneficial collaborations. The social focus in university-industry collaborations is shifting the paradigm from triple to quadruple and quintuple helices (Barbulescu & Constantin, 2019; E. Carayannis & Campbell, 2013). Recent papers point to a need for better cooperation between businesses and higher education institutions to prepare skilful corporate social entrepreneurs (Davidavičienė & Raudeliūnienė, 2021; Rickhoff-Fischer et al., 2021). One way forward in this respect are internship programs for sustainable development, backed by an academic curriculum (Wijnker et al., 2017).

Bridging organizations – Given that more than 50% of collaborations fail, universities increasingly collaborate with bridging organizations to facilitate collaborations, provide meeting places for sustainability projects, and support talent in creating impact. These include science parks, social incubators, learning labs, regional development centers (Baycan & Olcay, 2021; Cadorin et al., 2019; Mora et al., 2015; Sansone et al., 2020). Their role in bridging the gap between HEIs and all stakeholders who need to be managed for the sake of sustainable development is gaining traction in the literature.

Social Innovation – Universities collaborate with social and institutional contexts of the entrepreneurial ecosystem to foster social innovation. Frequent contact with government, academic support units, customers, suppliers, and competitors is emphasized to enhance social innovations (Monteiro et al., 2021). Universities are recognized as central actors in driving social innovation. One study on Latin American universities highlights the importance of collaboration, strategic management, and incorporating social innovation into university policies to foster social innovation activities (Unceta et al., 2021). Pelagallo et al., 2021

examine the role of the university as an actor, orchestrator and promoter of 'social' culture. Recent studies highlight the transformation of the university's role from a secondary subject to a strategic player of primary importance.

Co-creation

Entrepreneurial Universities as Engaged/ Sustainable Universities - Universities focus on engagement as a form of entrepreneurial activity, particularly suitable for smaller university programs and their smaller-sized industrial partners. They develop theoretical frameworks and practical applications to facilitate engagement and entrepreneurial endeavors through sustainability education (Ramos-Monge et al., 2019). The development of entrepreneurial universities involves alternating periods of exploration and exploitation, where internal management of knowledge plays a central role (Centobelli et al., 2019). Some contend that smaller universities not typically involved with industry and entrepreneurial activities, engage with smaller scale collaborations with small businesses (Betts & Santoro, 2019). Others find that the concept of entrepreneurial universities overlaps with engaged universities, where universities actively contribute to social change, social impact, and social entrepreneurship (Moussa et al., 2019b; Sánchez-Barrioluengo & Benneworth, 2019). Most recently the focus of entrepreneurial universities is shifting towards sustainability, where leading universities are spearheading a movement towards embedding sustainability in all three missions (Cai & Ahmad, 2023; Etzkowitz, 2022).

Circular economy – Universities increasingly collaborate to reduce their environmental impact and promote sustainable practices on campus (Mendoza et al., 2019b; Williams & Powell, 2019). Activities and initiatives are designed to engage students and foster a culture of sustainability and social responsibility (Mendoza et al., 2019a). Studies on waste management strategy in a university campus emphasizes the mobilization and participation of the academic community in the process (Nolasco et al., 2020; Owojori et al., 2020). Janssens et al., 2021, show that transversal competences and valorization competences are equally important as technical competences for a circular economy. Their study highlights the importance of collaboration between HEIs and businesses to align educational programs with the competence needs of businesses in the context of the circular economy.

Ecosystem – Universities emphasize knowledge creation, circulation, and transfer among different stakeholders. With the advancement of the notion of the entrepreneurial ecosystem, universities are engaging in various roles in the ecosystem, from building ones around sustainability entrepreneurship (Fichter & Tiemann, 2018), to mobilizing and orchestrating resources for the support of sustainable entrepreneurs (Rinaldi et al., 2022; Wei, 2022). They foster collaboration, social innovation, and wide networks to become more entrepreneurial, innovative, and socially impactful. Starting from an inclusive approach and a network perspective, universities promote entrepreneurship at all levels and facilitate interaction with other public and private actors from the community level (Gheorghiu et al., 2021). Additionally, universities embedded in entrepreneurial ecosystems are more likely to introduce social entrepreneurship educational programs (Kwong et al., 2022)

Co-creation with students – Universities stimulate the co-design of a new curriculum

involving both online and onsite platforms to support learning and understanding of non-destructive ways of thinking. With the shift from peripheral to central strategic importance of universities' social responsibility, social intrapreneurship is stimulated among students as leaders of change with HEIs (Sánchez-Hernández & Mainardes, 2016). This approach highlights the importance of creating a community of practice and collaboration among students to enhance their understanding and support for sustainable practices. When empowered to find the solution to their own consumption, students take leadership in waste management activities on campus (Bugallo-Rodríguez & Vega-Marcote, 2020). Students' involvement in co-creation behaviour is found to be activated by students' community involvement and exploitation of interactive technology (Magni & Pezzi, 2020).

Conclusions and future research directions

Universities are increasingly engaging in Third Mission activities that contribute to the economic and social development of the regions in which they operate. Despite the widespread recognition of the social impact of the Third Mission, the concept remains ambiguous and lacks critical reflection (Compagnucci and Spigarelli, 2020). Universities are expected to create social impact without clear guidance as to what are the mechanisms they can apply to do so. The purpose of this study was to map and analyze the existing literature on the various mechanisms for societal engagement applied by universities in pursuit of social impact. Due to the vastness of the topic and its transcendency among disciplines we achieved this by combining descriptive analysis and systematic literature review (SLR) (Donthu et al., 2021). We made a detailed synthesis from the literature on relevant "interesting approaches to societal engagement" (Compagnucci and Spigarelli, 2020). In our expanded framework we found both embedded and emerging TM activities. Our study has important implications for universities and policymakers, as we propose a transformative framework of innovation for inclusive development for an expanded understanding of HEIs own TMs (Kruss & Gastrow, 2017).

Despite the ambiguity of the Third Mission, especially when it comes to its societal engagement, there are recurring trends in the literature as to the mechanisms universities use to amplify their social impact. While taken for granted and widely discussed in the literature, this aspect of the TM has not attracted enough attention in the literature. This SLR contributes by identifying and mapping the various activities applied by HEIs in pursuit of their Social Third Mission. We group these findings into 3 major categories – Responsible education, Knowledge transfer and Co-creation. While some of them are intrinsically embedded in the university offering of education, the main mission of HEIs, new forms are emerging such as co-creation with students and non-commercial spin-offs. In fact, universities are seen as shifting towards sustainable universities and to active orchestrators of resources, be it through an existing ecosystem or through the creation of one.

Responsible education - This is also the one which our study shows has been researched the most in terms of types of education programs offered with an increasing shift towards social entrepreneurship, sustainable entrepreneurship, circular economy and

lifelong learning. Entrepreneurial education is often expanding beyond the classroom to include cooperation with local communities and other organizations. As experiential learning is gaining traction and students are tasked with co-creating and designing educational outcomes together with the local community, so is the community-based effect of education increasing. Engaging non-degree seeking students in continuing education programs is an important aspect of the STM, as is the opportunity for sustainability-oriented placements and internships. The latter have received less attention in the literature thus far and warrant a fruitful field for future research. More research is needed on competency frameworks necessary for educators engaged in sustainability around the world. With the rise of sustainability education, more research is needed on most effective types of delivery.

Knowledge transfer – As the community-based effect of education is increasing, this in turn leads to new forms of knowledge transfer beyond the technological ones, like consulting of social and green entrepreneurs by faculty and students alike. Societal engagement has taken many shapes and forms, and interesting approaches can be found as well in the well-established economic aspect of the TM, and more specifically through its technology transfer practices. Social innovation has brought together universities and community to work together on solving society's most pressing issues. The emerging role of students as transfer agents to the university and is a valuable stream for future research. As non-commercial forms of academic and student spin-offs are emerging, future research should focus on capturing the value they create, their antecedents and success indicators. Research should as well shed light on the social impact of these spin-offs. When discussing the cooperation with social and green entrepreneurs, it is worth researching how universities can identify and attract them, what makes these collaborations successful, what is the impact of the collaboration. In this regard, bridging organizations as an emerging field of research, deserve additional research as to when and why universities resort to them, what types can be found, what is their success rate, how do they emerge and what is their role in the process of creating social impact. Open innovation as part of social innovation in an effort to create societal engagement is a fruitful area for future research.

Co-creation - the emerging role of the university as co-creator for sustainability warrants a few strands of future research. The empowering of students in creating circular campuses also poses the question of what students are capable of beyond community-based learning practices. Student-led clubs, events, consulting and spin-offs are to be examined for antecedents and also for the impact they can potentially create. What motivated students to embark on a social or a green enterprise and what is the survival rate of these enterprises? What is the value that students create and what type of education programs are most likely to appeal to students when it comes to sustainability? Furthermore, how do universities decide in which project to engage when it comes sustainability and how do they choose their partners? What roles do universities assume – passive or active, and why? When does a university assume a central role in building or orchestrating an ecosystem in support of sustainable entrepreneurship? What aspects constitute a sustainable university?

The role of universities in creating and amplifying social impact is unquestionable. Given the problems of society and the

environment we are facing today, there will be an undeniable shift from the economic focus to the social focus of university activities, hence this HEIs will need a guiding structure and this study is an attempt in that direction.

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Appendix A

The following final search string has been applied in the Scopus database on October 22nd:

(TITLE-ABS-KEY (“social entrepreneur*” OR “sustainab* entrepreneur*” OR “circular” OR “eco-preneur*” OR “community-based learning” OR “university co-creation” OR “engaged universit*” OR “university third mission”) AND TITLE-ABS-KEY (“university W/2” OR “Higher education institution” OR “entrepreneurial universit*” OR “academic entrepreneur*”)) AND (LIMIT-TO (DOCTYPE , “ar”)) AND (LIMIT-TO (LANGUAGE , “English”)) AND (LIMIT-TO (SRCTYPE , “j”))

The initial query in the Scopus database returned 196 results. This query was further refined to include only English language peer-reviewed articles published in journals. Thus, we count on the validated knowledge of the anonymous review process and have not included other documents, such as conference papers or book chapters. The final result is 122 scholarly articles.

The following search string has been applied in the Web of Science database on October 22nd:

(ALL=(“social entrepreneur*” OR “sustainab* entrepreneur*” OR “circular” OR “eco-preneur*” OR “community-based learning” OR “university co-creation” OR “engaged universit*” OR “university third mission”) AND TS=(UT2”university” OR “Higher education institution“ OR “entrepreneurial universit*” OR “academic entrepreneur*”)) AND (DT==(“ARTICLE”) AND LA==(“ENGLISH”))

This search resulted in 47 English language articles in peer reviewed journals. The two databases were merged, and 37 duplicates were removed to form the final database of 134 papers.

All titles were reviewed for relevance which led to the exclusion of 19 irrelevant articles. The remaining 112 articles were thoroughly read for the purposes of the content analysis part of this literature review.

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