

KNOWLEDGE MANAGEMENT PROCESSES TO SUPPORT ENTREPRENEURSHIP EDUCATION ‘FOR’ TECHNOPRENEURSHIP: A CASE STUDY OF INDONESIA

Najmi Shaumi Mumtaz¹, Jann Hidajat Tjakraatmadja², Hary Febriansyah³

^{1,2,3}School of Business and Management, Institut Teknologi Bandung, Indonesia

Summary:

Technopreneurship is a new breed of entrepreneurship which has become the latest topic of discussion relevant in today’s digital era. Regarding this trend, Entrepreneurship Education (EE) programs offered in Higher Education Institutions (HEIs) have also started to shift their purpose and approach to technopreneurship. However, providing technopreneurship education remains a challenge as it requires a more multidisciplinary approach, covering entrepreneurship and technology-related approaches, which makes it more complex. Therefore, this study aims to develop a framework that defines and integrates knowledge management processes with EE ‘for’ technopreneurship, considering that multidisciplinary knowledge and experience-based learning are central in the study and venture creation process. Since this paper covers the initial phase of the development of the conceptual framework, it will adopt a qualitative approach. The framework is expected to inform the teaching and learning process of technopreneurship, especially in emerging countries such as Indonesia.

Track: Entrepreneurship

Word count: 1,981

INTRODUCTION

Technopreneurship, or technology-based entrepreneurship, is an emerging concept that has received significant attention over the past years (Bomani, Gamariel, and Juana, 2021). It has been the latest topic of discussion, which has affected the provision of conventional Entrepreneurship Education (EE) programs in Higher Education Institutions (HEIs) to shift to technopreneurship education (Kazakeviciute, Urbone, and Petraite, 2016, Ratten and Usmanij, 2021). One of the driving factors of this trend is the rising importance of technology integration in businesses today, making it a requisite for businesses to gain a competitive advantage (Tornikoski, Rannikko & Heimonen, 2019). However, pursuing technopreneurship comes with more challenges due to the increasing difficulty compared to conventional entrepreneurship since experience and insights are also limited due to the relatively recent avenue (Rashid, 2019). Moreover, the additional and unpredictable challenges that the students must face with the utilization and development of technology for business makes it more challenging to follow technopreneurship.

To tackle this issue, adopting an appropriate teaching and learning approach becomes necessary (Byun et al., 2019, Nambisan, 2017, Galvão, Ferreira, and Marques, 2018) since different EE approaches results in different targeted results. Of the EE approaches, studies claim that the teaching 'for' entrepreneurship method is more effective in graduating students with their own ventures or start-ups (Boldureanu et al., 2020, Ratten and Usmanij, 2021). The reason is that teaching, learning, and practicing entrepreneurship, especially technopreneurship, through experience yields more concrete outcomes (Henry et al., 2005, Mason and Arshed, 2013, Lam, 2010). It also demands students to be immersed in real-life entrepreneurial experiences and situations that will prepare them for their lifelong entrepreneurial journey (Pittaway and Cope, 2016, Solomon et al., 2019), which is relevant in the context of technopreneurship. Learning and creating technology-based ventures also requires collaboration with other faculties or schools besides business and management to support technological aspects (Bischoff et al., 2017; Fischer et al., 2017; Moroz et al., 2010). Hence, this demand requires an experiential learning process characterized with a multidisciplinary knowledge-intensive and collaborative atmosphere (Bell, 2015, Bischoff et al., 2017, Liu et al., 2019). ~~providers need to adapt to help create entrepreneurs who can take advantage of and develop technology as a business opportunity (Nambisan, 2017).~~

Given the extensive knowledge and collaboration involved, along with EE's iterative and flexible nature (Neck and Corbett, 2018), Knowledge Management (KM) is deemed indispensable to guiding and helping the overall teaching, learning, and application process (Bandera et al., 2017, Anderson and Hardwick, 2017). The relevance becomes more apparent as learning and knowledge are both pivotal to the entrepreneurship process (Williams Middleton et al., 2020). Additionally, the integration between these two subjects becomes even more critical considering the multidisciplinary nature of technopreneurship. Hence, KM is hoped to act as means that can eventually help the students to exchange and use the extensive knowledge required for each step of the new venture creation process (Matlay, 2018). However, the integration of technopreneurship with KM is still rare, especially in Indonesia (Sumarno & Suarman, 2017). Meanwhile, studies have proven that technopreneurship and KM have benefitted business as it enables the transfer of knowledge more directly and enhance business processes to be more effective (Fowosire et al., 2017; Anderson & Hardwick, 2017). This signifies a need for further conceptualization and discussion that considers knowledge management tools, practices, and perspective. Elucidating the knowledge and knowledge management processes is critical to provide a more explicit and

comprehensive framework for the learning process (Bandera et al., 2017, Bischoff et al., 2017), which is needed to carry out the entrepreneurship education 'for' technopreneurship program. Moreover, since the practice of technology-based entrepreneurship and knowledge management is contextual (Thomassen et al., 2019), a model adjusted according to Indonesia's context, situation, and needs becomes imperative.

Thus, the urgency of this research can be viewed from three aspects: theory, practice, and policy.

- Theory:

This research will contribute to the literature of entrepreneurship education, especially technopreneurship in Indonesia. This research enriches the literature on entrepreneurship education and technopreneurship by integrating it with the subject of knowledge management, which has not been addressed often.

- Practice:

This study is expected to help execute and organize entrepreneurship education 'for' technopreneurship programs and achieve the goal of creating entrepreneur graduates effectively by providing a practical guide.

- Policy:

This research is expected to encourage new policies that support the teaching and learning process of technology-based entrepreneurship education programs in HEIs. For instance, the findings of this paper could create new policies for collaboration between study programs or lecturers to support technopreneurship education.

OBJECTIVES

This study endeavours to fill the gap by providing a framework to inform and guide educators and policymakers in entrepreneurship education with the 'for' technopreneurship approach. In particular, the present study aims to develop a framework based on knowledge management to support entrepreneurship education's delivery, learning, and practice of technopreneurship in creating entrepreneur graduates with start-ups.

LITERATURE REVIEW

A. Technopreneurship Education

Technopreneurship, which also goes by the name of "technology-based entrepreneurship", "digital entrepreneurship", and "technology ventures", is a growing concept that integrates entrepreneurial skills to take advantage of the advancement of technology (Fowosire et al., 2017; Salhieh and Al-Abdallat, 2022). It includes the process of technology identification, development, and creation of opportunities to advance new ventures or startups (Fowosire et al., 2017). Therefore, technopreneurship relies on both entrepreneurial skills and technological knowledge and skills (Bailetti, 2012). Due to the multidisciplinary subject, studies have suggested that for technopreneurship to be successful, it is also determined by the social context in which it is developed and operated (Fowosire et al., 2017).

With these aspects in mind, a fitting entrepreneurship education (EE) approach is needed to facilitate the provision of technopreneurship. As Kickul et al. (2018) argue, for an effective entrepreneurship education program, it is crucial for HEIs and facilitators to identify the program's purpose first, since the teaching method needs to be adjusted according to it (Mwasalwiba, 2010).

Entrepreneurship Education (EE) has been defined in numerous perspectives and avenues (Ratten and Usmanij, 2021). One of the most common categorisations to date is based on the learning outcomes (Kakouris and Liargovas, 2020). Hannon (2005) further extends this category to entrepreneurship education based on the learning process into education "about," "for," and "through" entrepreneurship (Hartshorn et al., 2005, Lindner, 2018, Kakouris and Liargovas, 2020). Of the EE approaches, the "for" entrepreneurship approach's learning outcome is students starting and having new businesses (Hytti and O'Gorman, 2004). It involves experiential learning, which becomes relevant in pushing technopreneurship due to the practice-based nature and context that may support a multidisciplinary interaction and cultivation (Ramsgaard, 2018, Kakouris and Liargovas, 2020). Moreover, the new venture creation phases, typically pre-creation, initiation, and growth (Diakanastasi et al., 2018), often inform the entrepreneurship education curriculum that follows the 'for' approach (Mandel and Noyes, 2016, Bell, 2015, Sirelkhatim et al., 2015).

B. Knowledge Management for Entrepreneurship Education

Knowledge Management (KM) is generally defined based on three main aspects: people, process, and technology (Gurteen, 1998; Areed et al. 2020). Although the three elements are interdependent, the KM process is argued to have hold the biggest weight in defining KM (Mahdi et al., 2019). As McNerney and Koenig (2011) identify, KM process consists of knowledge creation, validation, acquisition, distribution, storage, and implementation or application activities. This process contributes to KM being acknowledged as a driver for innovation and competitive advantage to improve the performance of corporates (Vick and Robertson, 2018, Chevallier et al., 2016).

However, as of today, knowledge management's relevance has also been increasingly recognized for education, especially in Higher Education Institutions (HEIs) (e.g., (Nawaz and Gomes, 2014, Sunalai and Beyerlein, 2015). It is due to the consideration that Higher Education Institutions (HEIs) are known as knowledge-intensive organisations (Gifford and McKelvey, 2019). HEIs create new knowledge through research, share knowledge through teaching and learning, and transfer knowledge through stakeholder collaboration (Al-Kurdi et al., 2018, Al-Kurdi et al., 2020, Stamou, 2017), which is relevant for endorsing technopreneurship (Siegel, 2004, Amante, 2017). KM can foster cooperation among researchers and lecturers (e.g., Dee and Leisyte, 2017, Fullwood et al., 2013, Quarchioni et al., 2022), which enhances knowledge creation. It further helps design better courses for a more efficient transfer of knowledge among stakeholders (Fischer et al., 2020, de Wit-de Vries et al., 2018, Marchiori and Franco, 2020, Nawaz and Gomes, 2014).

In terms of KM adoption in HEIs, not many studies have specifically integrated the concept in an Entrepreneurship Education program. Furthermore, earlier studies mostly focus on how KM helps educators disseminate knowledge to a wider society (Laal, 2011). Before getting into the big picture, we believe that adopting KM, especially its process, to Entrepreneurship Education programs that follow technopreneurship will be helpful for the students and fruitful. The extant literature is also majorly situated in developed countries (Quarchioni et al., 2022), while the

context of Indonesia as an emerging country, this adoption of KM in education is still very much needed.

C. Communities of Practice for Entrepreneurship Education

Communities of Practice (CoP) has been one of the most referred concepts used as a medium to enhance or facilitate knowledge management processes (Filstad, 2014, Oreszczyn et al., 2010, Triste et al., 2018). It is believed that social connections create knowledge and co-produced through social interactions in a community setting (Pyrko et al., 2019, Borzillo et al., 2011). Knowledge is also grounded in practice, and innovation arises from the improvised methods used by community members to address challenges (Bolisani and Scarso, 2014), indicating that knowledge is not just theoretical understanding. It is the activity that people undertake and share in a social context (Filstad, 2014, Nicolini, 2011).

Consequently, CoP primarily focuses on sharing practical knowledge, where the participants create a collective repertory of resources that may include best practices for resolving common issues, etc. It should be noted that building this kind of relationship takes time; it cannot be created automatically just by a one-time sharing. However, it can be facilitated and encouraged by creating a formal structure and context for the people to be involved in (Pyrko et al., 2019, Randhawa et al., 2017). Based on the elaboration above, the concept of CoP is believed to be relevant to enhance the teaching and learning process of technology-based entrepreneurship for this study, particularly the informal or experience-based learning part outside the classroom.

RESEARCH METHODOLOGY

Since this study aims to uncover an underexplored topic and relationship, which makes the nature of the study exploratory, this study will thus adopt a qualitative approach. The data collection and analysis processes will be iterative to reach the rigorous and detailed data for a holistic framework. The data collection procedures include literature and document reviews, in which the documents will cover course syllabi, journals, and reports, and focus group discussions. Focus Group Discussions (FGD) will then be carried out with experts and actors involved in the teaching and learning process of Entrepreneurship Education 'for' Technopreneurship. Once the qualitative data have been collected, the FGD recordings will be transcribed and analyzed using thematic analysis. This qualitative phase is conducted to formulate the initial theoretical model, which will then be used to inform the next research phase to develop the final framework.

KM Process in Entrepreneurship Education 'For' Entrepreneurship

Given the recognized concerns to fill the gap of the relevant knowledge and skills for entrepreneurship and the importance of a supportive and collaborative learning facility for the success of entrepreneurship education 'for' technopreneurship (Davey et al., 2016), this study endeavors to develop a framework to address this issue. In particular, the framework is developed to help achieve the target of graduating students from the entrepreneurship education program with a start-up. However, since this paper covers only the first phase, this paper will only focus on identifying the knowledge management processes to define the learning process of the 'for' entrepreneurship approach of technopreneurship, which will become the core of the final framework. Aside from the widely acknowledged importance of content and context, the process is a critical aspect in entrepreneurship education "for" entrepreneurship approach (Pittaway &

Cope, 2007). Therefore, the knowledge management process becomes a critical element in the teaching and learning process, which is outlined in figure 2.

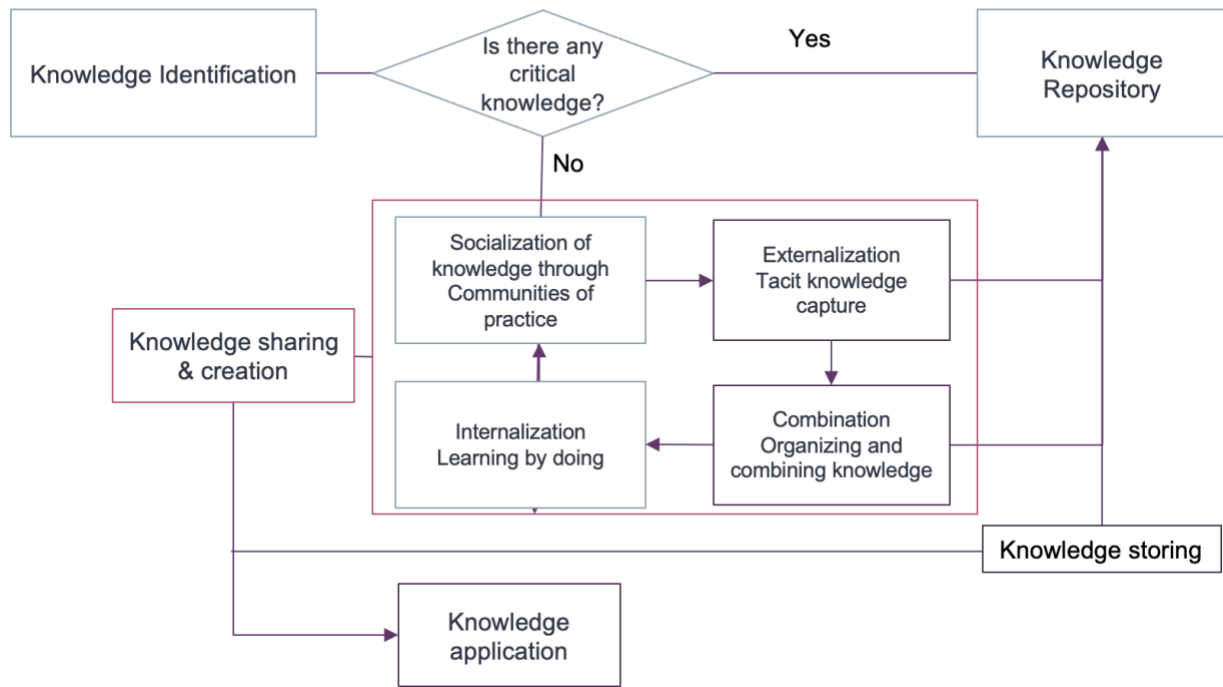


Figure 2. Knowledge Management Process in CoP of KM Ecosystem

The figure above illustrates the process of knowledge management applied in entrepreneurship education to support the students. It begins with identification of the required knowledge. When what they needed has already been discussed, they can turn to the knowledge repository to find what they need. If not, they enter the Community of Practice (CoP) to engage in knowledge sharing and creation activities guided by the SECI model. The knowledge sharing and creation phase is the main process elaborated to fill in the critical knowledge gaps for the new venturing process.

Development plans

By September 2023, the data will have been collected and most analysis will have been completed. Once the knowledge management process has been conceptualized, the researcher will continue refining the conceptual framework to guide future fieldwork. The final framework will cover the people, process, and enablers of the knowledge management ecosystem for supporting entrepreneurship education. The final conceptual framework of the knowledge management ecosystem is expected to aid the teaching and learning process of entrepreneurship education for students to create new technology-based ventures.

REFERENCES

- Al-Kurdi, O., El-Haddadeh, R. & Eldabi, T. 2018. Knowledge sharing in higher education institutions: a systematic review. *Journal of Enterprise Information Management*, 31, 226-246.
- Al-Kurdi, O. F., El-Haddadeh, R. & Eldabi, T. 2020. The role of organisational climate in managing knowledge sharing among academics in higher education. *International Journal of Information Management*, 50, 217-227.
- Anderson, A. R. & Hardwick, J. 2017. Collaborating for innovation: the socialised management of knowledge. *International Entrepreneurship and Management Journal*, 13, 1181-1197.
- Antal, N., Kingma, B., Moore, D. & Streeter, D. 2014. University-Wide Entrepreneurship Education. *Innovative Pathways for University Entrepreneurship in the 21st Century*.
- Areed, S., Salloum, S.A. and Shaalan, K., 2020. The role of knowledge management processes for enhancing and supporting innovative organizations: a systematic review. *Recent advances in intelligent systems and smart applications*, pp.143-161.
- Bailetti, T., 2012. Technology entrepreneurship: overview, definition, and distinctive aspects. *Technology innovation management review*, 2(2).
- Bandera, C., Bartolacci, M. R. & Passerini, K. 2017. Knowledge Management and Entrepreneurship. *Entrepreneurship*.
- Bell, R. 2015. Developing the next generation of entrepreneurs: Giving students the opportunity to gain experience and thrive. *The International Journal of Management Education*, 13, 37-47.
- Bischoff, K., Volkmann, C. K. & Audretsch, D. B. 2017. Stakeholder collaboration in entrepreneurship education: an analysis of the entrepreneurial ecosystems of European higher educational institutions. *The Journal of Technology Transfer*, 43, 20-46.
- Boldureanu, G., Ionescu, A. M., Bercu, A.-M., Bedrule-Grigoruță, M. V. & Boldureanu, D. 2020. Entrepreneurship Education through Successful Entrepreneurial Models in Higher Education Institutions. *Sustainability*, 12.
- Bolisani, E. & Scarso, E. 2014. The place of communities of practice in knowledge management studies: a critical review. *Journal of Knowledge Management*, 18, 366-381.
- Bomani, M., Gamariel, G. and Juana, J., 2021. University strategic planning and the impartation of technopreneurship skills to students: Literature review. *Journal of Governance and Regulation/Volume*, 10(2).
- Borzillo, S., Aznar, S. & Schmitt, A. 2011. A journey through communities of practice: How and why members move from the periphery to the core. *European Management Journal*, 29, 25-42.
- Byun, C.-G., Sung, C., Park, J. & Choi, D. 2018. A Study on the Effectiveness of Entrepreneurship Education Programs in Higher Education Institutions: A Case Study of Korean Graduate Programs. *Journal of Open Innovation: Technology, Market, and Complexity*, 4.
- Chevallier, C., Laarraf, Z., Lacam, J. S., Miloudi, A. & Salvétat, D. 2016. Competitive intelligence, knowledge management and coopetition. *Business Process Management Journal*, 22, 1192-1211.
- Cordeiro, M. D. M., Oliveira, M., & Sanchez-Segura, M. I. (2022). The influence of the knowledge management processes on results in basic education schools. *Journal of Knowledge Management*, 26(10), 2699-2717.
- Davey, T., Hannon, P. & Penaluna, A. 2016. Entrepreneurship education and the role of universities in entrepreneurship. *Industry and Higher Education*, 30, 171-182.

- De Wit-De Vries, E., Dolfsma, W. A., Van Der Windt, H. J. & Gerkema, M. P. 2018. Knowledge transfer in university–industry research partnerships: a review. *The Journal of Technology Transfer*, 44, 1236-1255.
- Dee, J. & Leisyte, L. 2017. Knowledge sharing and organizational change in higher education. *The Learning Organization*, 24, 355-365.
- Diakanastasi, E., Karagiannaki, A. & Pramatar, K. 2018. Entrepreneurial Team Dynamics and New Venture Creation Process: An Exploratory Study Within a Start-Up Incubator. *SAGE Open*, 8.
- Filstad, C. 2014. Learning and knowledge as interrelations between CoPs and NoPs. *The Learning Organization*, 21, 70-82.
- Fiore, E., Sansone, G. & Paolucci, E. 2019. Entrepreneurship Education in a Multidisciplinary Environment: Evidence from an Entrepreneurship Programme Held in Turin. *Administrative Sciences*, 9.
- Fischer, B., Guerrero, M., Guimón, J. & Schaeffer, P. R. 2020. Knowledge transfer for frugal innovation: where do entrepreneurial universities stand? *Journal of Knowledge Management*, 25, 360-379.
- Fischer, B. B., Schaeffer, P. R., Vonortas, N. S. & Queiroz, S. 2017. Quality comes first: university-industry collaboration as a source of academic entrepreneurship in a developing country. *The Journal of Technology Transfer*, 43, 263-284.
- Fowosire, R.A., 2017. Technopreneurship: a view of technology, innovations and entrepreneurship. *Global Journals of Research in Engineering*, 17(F7), pp.41-46.
- Fullwood, R., Rowley, J. & Delbridge, R. 2013. Knowledge sharing amongst academics in UK universities. *Journal of Knowledge Management*, 17, 123-136.
- Galvão, A., Ferreira, J.J. and Marques, C., 2018. Entrepreneurship education and training as facilitators of regional development: A systematic literature review. *Journal of Small Business and Enterprise Development*, 25(1), pp.17-40.
- Gifford, E. & Mckelvey, M. 2019. Knowledge-Intensive Entrepreneurship and S3: Conceptualizing Strategies for Sustainability. *Sustainability*, 11.
- Hartshorn, C., Matlay, H. & Hannon, P. D. 2005. Paradoxes in entrepreneurship education: chalk and talk or chalk and cheese? *Education + Training*, 47, 616-627.
- Henry, C., Hill, F. & Leitch, C. 2005. Entrepreneurship education and training: can entrepreneurship be taught? Part I. *Education + Training*, 47, 98-111.
- Hytti, U. & O’gorman, C. 2004. What is “enterprise education”? An analysis of the objectives and methods of enterprise education programmes in four European countries. *Education + Training*, 46, 11-23.
- Kakouris, A. & Liargovas, P. 2020. On the About/For/Through Framework of Entrepreneurship Education: A Critical Analysis. *Entrepreneurship Education and Pedagogy*, 4, 396-421.
- Kazakeviciute, A., Urbone, R. and Petraite, M., 2016. Curriculum development for technology-based entrepreneurship education: A cross-disciplinary and cross-cultural approach. *Industry and Higher Education*, 30(3), pp.202-214.
- Kickul, J., Gundry, L., Mitra, P. & Berçot, L. 2018. Designing With Purpose: Advocating Innovation, Impact, Sustainability, and Scale in Social Entrepreneurship Education. *Entrepreneurship Education and Pedagogy*, 1, 205-221.
- Laal, M., 2011. Knowledge management in higher education. *Procedia computer science*, 3, pp.544-549.

- Lam, W. 2010. Delivery, Student Engagement and the Implementation of Good Practice in Entrepreneurship Education. *Industry and Higher Education*, 24, 467-473.
- Lindner, J. 2018. Entrepreneurship Education for a Sustainable Future. *Discourse and Communication for Sustainable Education*, 9, 115-127.
- Liu, F., Ma, J. & Li, R. 2019. Which Role Model Is More Effective in Entrepreneurship Education? An Investigation of Storytelling on Individual's Entrepreneurial Intention. *Front Psychol*, 10, 837.
- Mahdi, O. R., Nassar, I. A. & Almsafir, M. K. 2019. Knowledge management processes and sustainable competitive advantage: An empirical examination in private universities. *Journal of Business Research*, 94, 320-334.
- Mandel, R. & Noyes, E. 2016. Survey of experiential entrepreneurship education offerings among top undergraduate entrepreneurship programs. *Education + Training*, 58, 164-178.
- Marchiori, D. & Franco, M. 2020. Knowledge transfer in the context of inter-organizational networks: Foundations and intellectual structures. *Journal of Innovation & Knowledge*, 5, 130-139.
- Mason, C. & Arshed, N. 2013. Teaching Entrepreneurship to University Students through Experiential Learning. *Industry and Higher Education*, 27, 449-463.
- Matlay, H., 2018. Entrepreneurship education: New perspective on entrepreneurship education. *Education+ Training*, 60(7/8), pp.923-926.
- Mwasalwiba, E. 2010. Entrepreneurship education: a review of its objectives, teaching methods, and impact indicators. *Education + Training*, 52, 20-47.
- Nambisan, S., 2017. Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. *Entrepreneurship theory and practice*, 41(6), pp.1029-1055.
- Nawaz & Gomes 2014. Review of Knowledge Management in Higher Education Institutions. *European Journal of Business and Management*.
- Neck, H. M. & Corbett, A. C. 2018. The Scholarship of Teaching and Learning Entrepreneurship. *Entrepreneurship Education and Pedagogy*, 1, 8-41.
- Nicolini, D. 2011. Practice as the Site of Knowing: Insights from the Field of Telemedicine. *Organization Science*, 22, 602-620.
- Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D. & Czeglédi, C. 2017. The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, 44, 361-379.
- Oreszczyn, S., Lane, A. & Carr, S. 2010. The role of networks of practice and webs of influencers on farmers' engagement with and learning about agricultural innovations. *Journal of Rural Studies*, 26, 404-417.
- Pittaway, L. & Cope, J. 2016. Entrepreneurship Education. *International Small Business Journal: Researching Entrepreneurship*, 25, 479-510.
- Pyrko, I., Dörfler, V. & Eden, C. 2019. Communities of practice in landscapes of practice. *Management Learning*, 50, 482-499.
- Quarchioni, S., Paternostro, S. & Trovarelli, F. 2022. Knowledge management in higher education: a literature review and further research avenues. *Knowledge Management Research & Practice*, 20, 304-319.
- Ramsgaard, M. B. 2018. Experiential Learning Philosophies of Enterprise and Entrepreneurship Education. *Experiential Learning for Entrepreneurship*.

- Randhawa, K., Josserand, E., Schweitzer, J. & Logue, D. 2017. Knowledge collaboration between organizations and online communities: the role of open innovation intermediaries. *Journal of Knowledge Management*, 21, 1293-1318.
- Rashid, L., 2019. Entrepreneurship education and sustainable development goals: A literature review and a closer look at fragile states and technology-enabled approaches. *Sustainability*, 11(19), p.5343
- Ratten, V. & Usmanij, P. 2021. Entrepreneurship education: Time for a change in research direction? *The International Journal of Management Education*, 19.
- Salhie, S.E.M. and Al-Abdallat, Y., 2022. Technopreneurial intentions: the effect of innate innovativeness and academic self-efficacy. *Sustainability*, 14(1), p.238.
- Secundo, G., Ndou, V., Del Vecchio, P. & De Pascale, G. 2019. Knowledge management in entrepreneurial universities. *Management Decision*, 57, 3226-3257.
- Siegel, D. S., Waldman, D. A., Atwater, L. E. & Link, A. N. 2004. Toward a model of the effective transfer of scientific knowledge from academicians to practitioners: qualitative evidence from the commercialization of university technologies. *Journal of Engineering and Technology Management*, 21, 115-142.
- Sirelkhatim, F., Gangi, Y. & Nisar, T. 2015. Entrepreneurship education: A systematic literature review of curricula contents and teaching methods. *Cogent Business & Management*, 2.
- Solomon, G. T., Alabduljader, N. & Ramani, R. S. 2019. Knowledge management and social entrepreneurship education: lessons learned from an exploratory two-country study. *Journal of Knowledge Management*, 23, 1984-2006.
- Stamou, A. 2017. Knowledge management in doctoral education toward knowledge economy. *International Journal of Educational Management*, 31, 320-331.
- Sumarno, & Suarman. 2017. Development of technopreneurship-based entrepreneurship education for students at Universitas Riau, Indonesia. *International Journal of Economic Research*, 14, 65-74.
- Sunalai, S. & Beyerlein, M. 2015. Exploring knowledge management in Higher education institutions: processes, influences, and outcomes. *Academy of Educational Leadership Journal*, 19.
- Thomassen, M. L., Williams Middleton, K., Ramsgaard, M. B., Neergaard, H. & Warren, L. 2019. Conceptualizing context in entrepreneurship education: a literature review. *International Journal of Entrepreneurial Behavior & Research*, 26, 863-886.
- Tornikoski, E.T., Rannikko, H. and Heimonen, T.P., 2017. Technology-based competitive advantages of young entrepreneurial firms: Conceptual development and empirical exploration. *Journal of Small Business Management*, 55(2), pp.200-215.
- Triste, L., Debruyne, L., Vandenabeele, J., Marchand, F. & Lauwers, L. 2018. Communities of practice for knowledge co-creation on sustainable dairy farming: features for value creation for farmers. *Sustainability Science*, 13, 1427-1442.
- Vick, T. E. & Robertson, M. 2018. A systematic literature review of UK university–industry collaboration for knowledge transfer: A future research agenda. *Science and Public Policy*, 45, 579-590.
- Williams Middleton, K., Padilla-Melendez, A., Lockett, N., Quesada-Pallarès, C. and Jack, S., 2020. The university as an entrepreneurial learning space: The role of socialized learning in developing entrepreneurial competence. *International Journal of Entrepreneurial Behavior & Research*, 26(5), pp.887-909