
HEI-Led Innovative Green Transition in SMEs and Start-ups

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Abstract: This paper aims to understand how higher education institutions (HEIs) can support small and medium-sized enterprises (SMEs) and start-ups to become more sustainable through aligning more closely with the ISO 56002:2019 standard on Innovation Management Systems. The paper utilises an international study with data gathered through semi-structured interviews with eight (n=8) case companies from five (n=5) countries across numerous industries. Preliminary results show HEIs can greatly support and play a large role in facilitating the green transition and sustainability activities of SMEs and start-ups. Results indicate understanding a company's innovation management system by both the company and the HEI involved improves the effectiveness of the provided support and its resulting impact on increasing the innovative sustainability capacity.

Keywords: innovation management system; SMEs; start-ups; higher education institutions; innovation intervention; green transition; climate action; sustainability; ISO 56000; EU projects

1 Introduction

Higher Education Institutions (HEIs) have a crucial role to play in fostering the innovative green transition within the Small and Medium Enterprises (SMEs) and start-up landscape. By strategically leveraging the ISO 56002:2019 framework for innovation management, HEIs can equip these businesses with the necessary tools and knowledge to navigate this critical shift. These efforts should be meticulously designed to capitalise on and synergize with local comparative advantages and innovation capabilities.

This paper examines the role of HEIs in facilitating the adoption of innovation management practices by SMEs and start-ups during their transformation towards environmentally sustainable innovation. From

this perspective, we conducted a comparative study on Innovation Management System (IMS) according to the ISO 56002:2019. Companies from several European countries were included in the analysis, such as Finland, Lithuania, Ukraine, Bulgaria, and Romania.

2 Literature Review

By creating new knowledge and ideas, allowing the transfer of knowledge and technology to businesses, and helping students, who will eventually become entrepreneurs, improve their entrepreneurial skills, higher education institutions play a critical role in fostering corporate innovation. For a business to succeed in the long run, innovation is necessary.

HEIs can be key players in promoting business innovation by providing start-ups with consulting models and establishing long-lasting cooperation networks. A key element in supporting start-ups and SMEs is the transition from traditional to entrepreneurial universities (Unger et. al., 2020).

HEIs appear to require multidisciplinary teaching, learning, and research methods to play a civic role in society (Adhikari & Shrestha, 2022) because HEIs are the decisive enablers to change the mindset and values for the coming generations of citizens and leaders (Amaral et al., 2020). At the same time, management is easier to be taught in an academic environment, because its principles, processes and attributes can be systematically replicated (Savva, et. al. 2020). HEIs, with their missions and characteristics, gather stakeholders from both public and private sectors (Serrano-Bedia and Perez-Perez, 2022) and are hubs for innovation (Qu et al., 2021), economic activity and growth (Leal Filho et al., 2019b) and have a major impact on global transition (Vergani, 2024). Evidence shows that the combination of entrepreneurship education from different organisations, such as government agencies, incubators/accelerators and universities, promotes the establishment of high-technology firms (Breznitz & Q. Zhang, 2022).

The studies reviewed suggest that HEIs can play a significant role in supporting SMEs and start-ups in their innovation efforts. For example, Van Goolen et al. (2014) discuss the concept of International Innovation Labs as a platform for collaboration and knowledge exchange between SMEs and business schools. Similarly, Fitzky et al. (2023) argue that SMEs can learn from universities to enhance their innovation capabilities. Swetloff (2023) emphasises the role of HEIs in transferring innovation to the industry and fostering the creation of start-ups that invest in disruptive technologies.

Tidd and Bessant (2020) emphasise the importance of managing innovation in alignment with technological, market, and organisational changes. While their focus is broader, their insights into innovation

management systems can inform the understanding of how HEIs can support SMEs and start-ups in implementing ISO 56002:2019 standards. Overall, existing literature indicates a growing recognition of HEIs' role in supporting SMEs and start-ups in innovation management, albeit with limited focus on sustainability and green transition. The proposed research seeks to address this gap by examining how HEIs can effectively assist SMEs and start-ups in implementing ISO 56002:2019 standards, with a specific focus on green innovation and transition. Through a cross-country study, the research aims to provide valuable insights into best practices, challenges, and opportunities for HEI-led innovation support in the context of sustainability.

3 Methodology

This study uses a qualitative multi-case study methodology to investigate how HEIs can support start-ups and SMEs in effectively managing innovation activities in accordance with the ISO 56002:2019 requirements, with a specific emphasis on the green transition. The research has been carried out on eight SMEs and start-ups from various European countries, including Finland, Lithuania, Ukraine, Bulgaria, and Romania. Every company engaged in a methodical assessment process that had a duration of roughly three hours. Throughout these sessions, we used the Maturity of the Innovation Management Systems (MIMS) assessment tool to evaluate the existing condition of each company's Innovation Management System (IMS) based on the requirements outlined in ISO 56002:2019. The MIMS methodology is especially tailored to assess the efficacy of these systems in promoting successful business practices with an impact on the long term growth of the company.

The data gathering process ended mid April 2024. Data has been collected via the MIMS questionnaire developed by Innovation Way. Interviews were conducted by qualified facilitators from Curlabs and Savonia University of Applied Sciences. The interviewers interview company representatives in positions assumed to be knowledgeable about the innovation management activities. Additional interview participants included the representatives of HEIs, who also provided interpretation support in cases where there could have been a language barrier. The encounters have been documented, recorded and analysed thematically to guarantee a thorough comprehension of each situation specific to the company assessed.

The study aims to comprehensively examine the involvement of HEIs in facilitating the innovation management of SMEs and start-ups throughout their transition towards innovative environmentally sustainable practices. The research enables a thorough examination of each individual instance,

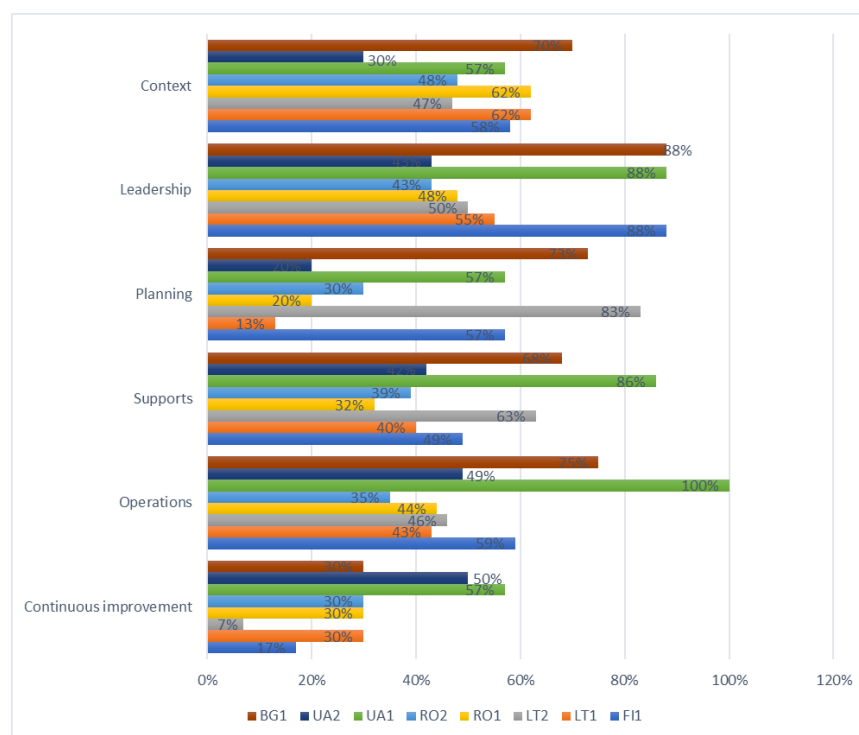
while also aiding in the identification of more general patterns across industries or countries finding valuable observations that may be relevant in several contexts.

4 Results

The research included a MIMS assessment of 8 SME's: 1 from Finland (FI1), 2 from Lithuania (LT1; LT2), 2 from Romania (RO1; RO2), 2 from Ukraine (UA1; UA2) and 1 from Bulgaria (BG1). Analysis of the maturity of innovation management system (IMS) and compliance with ISO 56002:2019 guidance in each company was based on 6 aspects: context, leadership, planning, supports, operations and continuous improvement (see Figure 1). The present research aims to improve our comprehension and use of an IMS by carefully following ISO 56002:2019 standards. Presently, organisations use aspects of ISO 56002:2019 as a means to drive innovation, however without a systematic framework. This sometimes leads to inconsistency and the failure to fully exploit potential prospects for more substantial breakthroughs. The goal is to enhance our innovation processes and increase project results by incorporating a well-defined development process into our IMS and also to establish a

stronger, more dynamic, and proactive innovation environment inside the firm.

Figure 1. Rate of SME alignment with ISO 56002:2019 guidance



Source: own collaboration

Comparing all ISO 56002:2019 guidance results shows notable differences in performance, both within individual organisations and across different companies. Leadership exhibited more adherence to rules and recommendations, especially in terms of dedication, but had difficulties in properly establishing and articulating positions, duties, and principles. The brief correlation analysis valid only for the surveyed enterprises showed that leadership is most important at the level of operations. In contrast, continuous improvement exhibited the lowest level of performance, characterised by widespread deficiencies in

evaluation procedures and internal audits. Continuous improvement shows a unique negative correlation with planning, indicating the need for further research in this area. Correlation analysis suggests a 'closed-loop' influence among operations, planning, support, and improvement, emphasising the critical role of operations and leadership, a hypothesis that warrants deeper investigation. The identification of planning and support categories revealed significant deficiencies in organisational structures and innovation portfolios, highlighting the need for enhanced fundamental procedures. Operations demonstrated proficiency in subsequent phases, such as solution development and deployment, indicating effective project management once projects are in progress. The research indicates that while there are certain individual strengths, it is crucial to make comprehensive changes in planning, support, and continuous improvement in order to enhance long-term innovation management in accordance with ISO-56002:2019 guidance.

The survey of company managers not only helped to find out what elements of the IMS are being applied in companies, but also raised awareness of sustainability and green transition issues. In essence, the inquiry was a tool to understand which processes require more attention in order to achieve less damaging results for the climate.

5 Conclusions and Further Research

HEIs play a vital role in driving the green transition among SMEs and start-ups. By utilising the ISO 56002:2019 framework, HEIs can empower these entities with the necessary tools and knowledge to navigate this pivotal shift. This paper, a part of the ILCA project, explores HEIs' role in facilitating innovation management practices, particularly focusing on SMEs' and start-ups' transition towards environmentally sustainable innovation. The MIMS assessment of eight SMEs revealed notable differences in their alignment with ISO 56002:2019 guidance. While leadership exhibited dedication, planning, support, and continuous improvement areas showed significant deficiencies, indicating room for improvement. An important point is that some SMEs showed stronger propensity towards internal adoption of the ISO guidance and sustainability approaches compared to external adoption where a stronger focus was on the provided products and/or services to benefit the customer.

This study underscores HEIs' pivotal role in supporting SMEs and start-ups in innovation management, particularly towards sustainable practices. By addressing the identified challenges and leveraging best practices, HEIs can foster a conducive environment for driving innovative solutions through innovation management practices aligned with ISO standards and

the green transition agenda. Further research should include longitudinal studies to track the evolution of SMEs' innovation management systems over time and evaluate the long-term impact of HEI-led innovation support. The current research showed differences in the type and intensity of innovation management related to sustainability. Some SMEs showed intentional and systematic alignment with ISO 56002:2019 guidance, whereas other SMEs only aligned to principles on an *ad hoc* basis. Furthermore, other SMEs displayed activities that are somewhat aligned with the ISO guidance, but were not aware.

The current study provided a snapshot of the possible relationships that move the quality of SMEs' management forward. Here HEIs can have a vital role in providing education on leadership and operations management. Exploring the policy implications of HEI-led innovation support for SMEs and start-ups, particularly in promoting sustainability and green transition at the national and European levels, would provide valuable insights. Additionally, cross-sectoral analysis should be conducted to identify common challenges and best practices across different industries. International comparative studies may be expanded to understand cultural and contextual influences on innovation management practices. Furthermore, investigating the role of HEIs within the broader innovation ecosystem and assessing their interactions with stakeholders such as government agencies, incubators/accelerators, and industry partners could enhance understanding of innovation dynamics.

Acknowledgements

This paper was supported by the ILCA project (<https://ilca-project.eu/>) within the EIT HEI Initiative – Capacity Building for Higher Education, funded by the European Union.

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