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Leveraging entrepreneurship education in fighting climate change - exploring the role of universities in encouraging NetZero businesses

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Abstract

The urgent need for climate action has brought attention to the role of entrepreneurship in achieving NetZero goals. This study examines how universities can leverage entrepreneurship education to foster NetZero entrepreneurship among graduates through a qualitative inquiry employing semi-structured interviews with a sample of eighteen university alumni who have founded their own businesses. This study finds that universities need to prioritize educational initiatives to raise awareness among students on the concept of NetZero businesses. Additionally, there is a need for initiatives that encourage collaboration and coordination among different university resources. Universities should improve the accessibility and availability of information related to NetZero initiatives and programs. Finally, providing additional activities beyond traditional classroom learning can better educate students about NetZero.

Track

Entrepreneurship (Entrepreneurship and Climate Change + Entrepreneurship Education)

Keywords

Entrepreneurship education, climate change, NetZero start-up, climate action, university, higher education

Introduction

The "*brief & rapidly closing window of opportunity*" to secure a liveable future is closing (IPCC, 2022). The IPCC 2022 report calls for immediate action to cut emissions to seize this opportunity and manage the climate emergency. A large number of countries across the world have already committed to achieving the NetZero emissions target by 2050 (Gov.uk, 2021). Furthermore, the ongoing crises of the Russia-Ukraine conflict and the character of post-COVID recovery have adversely affected the pursuit of ambitious climate policy towards NetZero emissions (NatWest Bank, 2021). Governments across the globe are urging businesses to play a more active role in fighting climate change (ONS, 2022). Since businesses significantly contribute to global emissions, reaching the NetZero target by 2050 will require substantial emission reductions from businesses in the future (British Business Bank, 2021).

Policymakers and academics have paid keen attention to the role of universities in fostering entrepreneurship (Guerrero *et al.*, 2016), and entrepreneurial ecosystems have gained significance in recent years (Spigel and Harrison, 2018; Wurth, Stam and Spigel, 2021). Research from the past has shown that universities can boost competitiveness and economic growth by developing university innovation and entrepreneurial ecosystems to produce societal value (Guerrero *et al.*, 2016). Such development may materialise through research, teaching, and the creation of new businesses as a consequence of nurturing social, human, and entrepreneurial capital (Guerrero, Cunningham and Urbano, 2015). More recently, research has called upon universities to play also a responsible role in addressing societal issues such as climate change (Cross and Congreve, 2021). Addressing this call for future research, the current study investigates the role universities may play in turning the corner in the race to climate action by helping create new businesses that have climate action embedded in their fabric. So, this paper explores how universities, through entrepreneurship education and entrepreneurial ecosystems, can help create new businesses born on a NetZero model.

This paper adopts a qualitative research approach to examine the role of university entrepreneurship education ecosystems in creating NetZero businesses. Eighteen semi-structured interviews were conducted with university graduates who have started a NetZero business. A purposive sampling strategy is used in this study with a geographically stratified sample from three leading universities in the UK. The selected institutes have distinct university entrepreneurship ecosystems, such as different combinations of research, teaching, mentorship, incubators, technology, infrastructure, and funding support.

The incorporation of an emphasis on sustainable business practises into entrepreneurship programmes could aid students in obtaining funding for their own starting businesses. The pertinence of the same is also driven by the change in investor preferences as investors are becoming increasingly interested in socially and ecologically responsible businesses.

Literature Review

There is a burgeoning academic literature on sustainable and green entrepreneurship that challenges the traditional model of traditional entrepreneurship, where the focus of value is to generate economic benefit and maximize profit generation (Friedman, 2007). Therefore, it is the time when we need to adopt new approaches to value creation, including economic health, social equity and environmental resilience (Laukkanen and Tura, 2020; Lüdeke-Freund *et al.*, 2020). Adding sustainability as the driving force for value creation provides us with the

promise of new sustainable business formations bringing additional value to society and the environment.

To limit confusion on what sustainable entrepreneurship is and to bring transparency to the term, Peng *et al.*, (2021) defines sustainable entrepreneurship as a process in which an entrepreneur realizes his or her intention in building up a company taking into account the enterprise's sustainability, by organizing this process in a way that a variety of economic, social and ecological angles are addressed. Entrepreneurial intention has been widely considered as a cornerstone to transform motivations into behaviour that could predict entrepreneurial behaviour (Arru, 2020). In the light of entrepreneurial intention being a driving force for new business formation, it is important to highlight the important relationship between environmental values and sustainable entrepreneurial intention (Peng *et al.*, 2021; Qazi *et al.*, 2021; Yasir *et al.*, 2021).

Connecting environmental values and sustainable entrepreneurial intention supports the argument outlined by Yasir *et al.*, (2021) that entrepreneurs who place environmental value at the heart of value creation build new businesses based on sustainability. Focusing on building businesses focusing on “people–profit–planet”, not only profitable but also helps to solve social problems, protect the natural environment and ensures resource recycling and regeneration (Peng *et al.*, 2021).

In today's world where the complexity of problems such as global warming, environmental degradation is both understood, entrepreneurship education has a crucial role in highlighting the importance of sustainable value creation (Lüdeke-Freund *et al.*, 2020) leading to new models for sustainable entrepreneurship. The goal of entrepreneurship education is to support the growth of a new generation of entrepreneurs who would understand the complexity of the pressing environmental and social challenges, including climate change and are capable of critically evaluating opportunities, and creatively identify resources to build solutions through collaborative action. We need a new generation of entrepreneurs who are well informed, think across all sectors and resilient to the constant changes on an environmental and societal level. Studies show that students with a deep understanding of environmental and social values are intended to engage in sustainable entrepreneurship (Qazi *et al.*, 2021). While entrepreneurship education plays a critical role in raising intention, universities also have a responsibility to support the formation of sustainable businesses by providing resources and infrastructure for students to excel. Moreover, the implementation of sustainable entrepreneurial behaviour will flourish from the raised level of sustainable entrepreneurial intention (Alvarez and Barney, 2020; Kuratko, Holt and Neubert, 2020).

Universities have a crucial role in first in, nurturing the next generation of students who are and will be in the heart of solving these complex problems across all sectors (Gianiodis and Meek, 2022). Second, in encouraging NetZero businesses by providing education, research, and innovation (Qazi *et al.*, 2021). The opportunity for universities to support the movement towards NetZero and climate action lies in both micro and macro level.

Sustainable entrepreneurial intent

Entrepreneurship scholars widely agree that the theory of planned behaviour (Ajzen, 1991) provides a solid foundation to explain entrepreneurial attitudes, intention and behaviour (Engle *et al.*, 2010). Furthermore, there is a clear agreement across entrepreneurship scholars that raised level of entrepreneurial intention leads to the creation of new ventures. The

intention to become a responsible entrepreneur has a strong relation to build sustainable or green ventures. Nurturing a green consciousness and awareness of pressing problems, such as climate change could enhance a creative approach to problem solving by building ownership towards the problem.

Having an awareness and strong ownership to climate change could also enable students to identify opportunities and engage in sustainable entrepreneurship and start new businesses in the green sector (Lans, Blok and Wesselink, 2014). Developing a deep understanding and awareness of sustainability forms the basis for sustainable entrepreneurship, which involves identifying, generating, and utilizing opportunities to develop new products and services that promote the preservation of the natural environment and local communities, while also providing growth and benefits for others (Volkman *et al.*, 2021).

Fostering an entrepreneurial mindset supports the discovery and creation of new ideas, and an increased entrepreneurial intention would lead to action and the starting of new businesses. Through modules, courses combining the fundamental components of entrepreneurship - know-what, know-why, know-who, and know-how (Sun *et al.*, 2017) - combined with key principles of sustainability would support the formation of businesses that are good for the environment and also generate economic value. Recent scholarly articles also highlight the strong relationship between the introduction to ‘environmental value’ and sustainability to the curriculum of entrepreneurship and the entrepreneurial intent to start green or sustainable businesses (Yasir *et al.*, 2021).

According to Demirel *et al.* (2019), green entrepreneurship support encourages and promotes students’ perception and behaviour regarding sustainable and green development. The university support system is key for nurturing students’ entrepreneurial intention into sustainable entrepreneurial intentions (Peng *et al.*, 2021). By highlighting the importance of early exposure to issues around sustainability, including the recent climate action and UN Sustainability Goals, entrepreneurship education plays a key role together with the university support system for turning entrepreneurship intention into green entrepreneurial intentions among students at this stage.

Overall, entrepreneurship education is essential for developing student intention to start sustainable businesses by providing education on sustainability, introducing students to successful sustainable businesses and entrepreneurs, providing support and resources, and offering experiential learning opportunities. By equipping students with the skills, knowledge, and motivation to launch successful and sustainable businesses, entrepreneurship education can play a critical role in building a more sustainable future.

While the role of universities in fostering sustainable entrepreneurship is key, supporting new venture creations from an ecosystem point of view is also required. Building an entrepreneurial ecosystem is key to enable opportunities to be developed and deployed to generate economic value. Resource-based theory (Barney, 1996) holds that the entrepreneurial resources are vital factors in the survival and development of start-ups, hence building a local, national and international level institutional support is equally important.

Institutional support – sustainable ecosystem

There is a constantly evolving literature on the role of ecosystems to support universities spin outs and the formation of new ventures. However, entrepreneurship education on its own is not enough to build sustainable businesses (Marteau, Chater and Garnett, 2021). Universities

have a role in building an ecosystem on clean energy and sustainable technologies, that could enhance the number of green businesses locally and nationally. Ecosystems are formed locally, nationally and also internationally to provide an environment where the external linkages are strongly developed and aligned with public and private agendas so there is a way to exploit resources by combining skills and knowledge towards a green economy.

Applying systems view to sustainable entrepreneurship proof motives the importance partnerships with industry and policy in order to build a new generation of talent. Having a strong ownership to collaboratively solving problems towards the climate action across sectors has a growing interest across the scholarly community. According to recent work on sustainable ecosystems, entrepreneurial ecosystem was defined as “a dynamic community of inter-dependent actors (entrepreneurs, suppliers, buyer, government, etc.) and system-level institutional, informational and socioeconomic contexts” (Audretsch and Belitski, 2017). Volkmann et al. (2021), highlight the role of different stakeholders, such as accelerators, incubators, business plan competitions, start-up awards, seed funds and public funding schemes, as key partners for the support and growth of new ventures (Isenberg, 2010).

Building partnership on the regional level in regional governance processes as well as by encouraging knowledge spillovers is beneficial for regional development and revitalization (Volkmann *et al.*, 2021). By providing focused funding, mentorship, and access to resources such as local networks, incubators and accelerator focused on the support of green businesses, universities can nurture students to turn their ideas into viable businesses that can contribute to a NetZero future.

Despite growing interest in the potential of entrepreneurship education to address environmental challenges, there is a significant gap in empirical research investigating how such education can be leveraged for fighting climate change and thereby achieving NetZero. Furthermore, while universities are increasingly recognized as key players in fostering entrepreneurial activity, little is known about their specific role in encouraging the development of NetZero businesses. This study aims to address this gap by exploring the potential of entrepreneurship education in the context of climate change and the specific role of universities in encouraging NetZero businesses.

Methodology

The sample size of 18 recent university graduates was chosen because it was considered sufficient to capture a range of perspectives and experiences related to entrepreneurship education and the creation of NetZero enterprises. The selection criteria for participants included having started a business that aims to achieve NetZero emissions, and having received some form of entrepreneurship education from one of the three selected universities.

The three universities were selected based on their reputation for having strong entrepreneurship education ecosystems, as well as their commitment to sustainability and NetZero goals. The purposive sampling method was used to ensure that participants had a diversity of experiences and perspectives, while also focusing on individuals who were most likely to have been influenced by the university entrepreneurship education ecosystem. Next, we present an overview of the entrepreneurship ecosystems of the three universities.

University A focuses on fostering entrepreneurial thinking and innovation across various disciplines. They offer a range of entrepreneurship programs, including undergraduate and postgraduate degrees, with an emphasis on interdisciplinary collaboration. Their entrepreneurship education integrates academic learning with real-world application,

encouraging students to develop practical skills and engage with industry partners. The resources available for entrepreneurship education at University A include a Business School Incubator, that provides support and resources to help students and graduates develop their startup ventures. They also have an Enterprise Society, a student-led society, that organizes events, workshops, and networking opportunities for students aspiring to become entrepreneurs. They have a Centre for Entrepreneurship that offers programs, workshops, and mentoring support for students interested in entrepreneurship. Lastly, they have a Seed Fund that provides financial support and investment opportunities for early-stage startups of the students.

University B has a strong focus on entrepreneurial leadership and enterprise development. Their entrepreneurship education emphasizes practical experiences and experiential learning opportunities. University B offers entrepreneurship modules and programs that encourage students to explore and develop their own business ventures. University B has a dedicated entrepreneurship center and support networks to facilitate the growth of entrepreneurial ideas. Their Enterprise Centre provides a range of entrepreneurship programs, workshops, and events for students and graduates. They have an in-house Incubator that provides dedicated space and support for early-stage ventures. Their Research and Innovation commercialisation team supports the commercialization of research and innovation through licensing and spin-out opportunities. Lastly, their Enterprise Fund offers funding and investment opportunities specifically targeted at student startups.

University C stands out for its focus on technology and innovation-driven entrepreneurship. Their entrepreneurship education is deeply rooted in research and practical application. They offer specialized programs in management, technology and engineering areas, providing students with industry-specific knowledge and skills. They emphasize collaboration with industry partners and offer incubation facilities to support student startups. University C provides various resources for entrepreneurship education including a Business Incubation Centre that provides physical facilities in the form of a co-working space, and mentoring support for startups and entrepreneurs. Their Centre for Entrepreneurship offers various programs, workshops, and networking events to promote entrepreneurship amongst its students. Lastly, their Business Seed Fund offers funding and investment opportunities for high-potential startups of students.

The interview protocol was designed to explore the participants' personal attitudes and beliefs about NetZero, as well as their experiences with entrepreneurship education and how it may have influenced their decision to start a NetZero business. The questions were designed to be open-ended and flexible, allowing participants to elaborate on their responses and provide detailed accounts of their experiences.

The inductive approach to data analysis involved a systematic process of coding and categorizing the interview data, with a focus on identifying themes and patterns that emerged across the transcripts. The process involved multiple rounds of coding, with the research team meeting regularly to discuss and refine the coding categories and themes.

The five emerging themes that were identified in the data analysis related to the role of university entrepreneurship education in shaping attitudes and beliefs about sustainability and NetZero, the development of entrepreneurial skills and competencies, the availability of resources and support for NetZero businesses, the importance of networks and partnerships, and the challenges and barriers faced by NetZero entrepreneurs.

Findings and discussion

In an effort to reach NetZero, UK businesses have a crucial role to play. While existing businesses are moving from orthodox business models to become sustainable, it is equally important to encourage the birth of new businesses that are founded on the NetZero model. Without such new businesses, the journey towards becoming environmentally friendly will be a constant catch-up game. In the UK alone, more than two-thousand businesses are founded every day (Reboot, 2021), highlighting the importance of developing NetZero entrepreneurship. Prior research has shown that entrepreneurship education can influence the entrepreneurial intentions of new businesses, but how it influences the intentions of entrepreneurs to start NetZero businesses has not been explored yet. But how entrepreneurship education influences the entrepreneurial intentions of entrepreneurs to start NetZero business has not been explored in the extant research yet. To address this gap in the literature, and to inform practice, we conducted interpretive research by interviewing entrepreneurs who pursued university education before starting their businesses. Based on the thematic analysis of the interviews, we identified five emerging themes presented as follows.

Emerging Theme 1: Teaching NetZero as a business opportunity

The first emerging theme from the research reveals that universities are overlooking the importance of incorporating the concept of NetZero emissions in their curricula. There appears to be a lack of awareness among university students about the concept of NetZero and sustainability goals. This is evidenced by the fact that many participants expressed confusion about what NetZero means and how it relates to their daily lives. There seems to be a need for universities to prioritize educational initiatives that focus on raising awareness and educating students about NetZero and sustainability goals. This is evident from one of the interviews (C4), where the interviewee stated, *"I never felt pushed or nudged to have a sustainable business from the university's side. Nobody ever asked if you want to become (to start) a sustainable business, a NetZero business."* On the other hand, in cases where universities do teach about NetZero emissions, they seem to focus primarily on the technical aspects and overlook the potential business opportunities that NetZero awareness presents. This means that while students are taught about the technologies and methods required to achieve NetZero emissions, they are not taught how to develop a profitable business model around it. The respondents expressed a keen interest in learning more about NetZero as a business opportunity, as they believed that integrating it with entrepreneurship subjects could help make a stronger case for it. One participant (B3) pointed out, *"See, I am here to study entrepreneurship, and I have paid a high amount of fees for it. If you teach me NetZero emissions on its own, I will not be interested. I am more interested in learning about it when you teach me how to create a business out of it."* Such expressions indicate a significant gap in the way universities approach the subject of NetZero emissions and highlight the need to bridge the gap between the technical aspects and the business aspects of NetZero emissions to encourage entrepreneurship in this area.

The research findings indicate a need for universities to create a business case for NetZero, not just for large corporations but also for start-ups. The respondents highlighted that many of the innovations and technologies required to achieve NetZero are likely to come from smaller, more agile companies. However, the limited case studies and teaching material on NetZero available currently focus mainly on large established businesses, which may not be relevant to students interested in starting their own businesses. One participant (A3) highlighted this gap, stating, *"Sometimes there's a focus on big companies that use sustainable practices in their businesses. But, there's nothing on the businesses that are formed within the university, start-ups that have come out of the university."* Similarly,

another participant (A6) expressed the need for teaching material that includes sustainable practices in launching a new business, saying, "*We have a session on Google's data store, which has all the sustainable bits in it. But if the university teaches this method of launching a new business with sustainability, that will be good.*"

The respondents emphasized the need for more examples of start-ups that have successfully implemented NetZero strategies in teaching material, enabling students to understand how they can apply NetZero principles to their entrepreneurial ventures, irrespective of the size or stage of development of the ventures. Therefore, there seems to be a need for universities to broaden their focus and provide more comprehensive teaching material that covers not just large corporations but also start-ups, to foster entrepreneurship in the field of NetZero emissions.

Emerging Theme 2: Lack of use of appropriate terminology

The second theme emerging from our research highlights the lack of appropriate terminology being used in universities to teach NetZero. The study reveals that the use of a wide range of overlapping terminologies leads to confusion among students, making it difficult for them to fully understand the concept of NetZero. Terms such as CSR, triple bottom line, sustainability, green business, B Corp, UN SDG, organizational purpose, social purpose, and others are often used interchangeably with NetZero, creating confusion. For instance, participant B3 mentioned this lack of clarity, stating that "*I don't know who needs to listen to this but CSR is not equal to NetZero, purpose is not equal to NetZero, triple bottom line is not equal to NetZero...*".

This confusion can make it challenging for students, including international students, to grasp and engage effectively with the concept of NetZero. As a result, the respondents emphasized the need for a common alignment of NetZero terminologies in teaching materials, particularly given the varied perceptions and understandings of international students. As participant A3 noted, "*In my home country, large companies are not encouraged to prioritize sustainability practices. In the UK, there is more emphasis on these practices, and they are considered more important.*". There appears to be a lack of appreciation for the diverse backgrounds of students in this context. With many international students coming to study at UK universities and a significant number of them starting their businesses in the UK, it is crucial to use appropriate and consistent terminology. To address this issue, educational institutions may need to update the content of their entrepreneurial courses, increase experiential learning and professional networking opportunities, and make it clear that they welcome students from diverse backgrounds. Universities may also consider several other measures, including providing clear definitions of key terms, using consistent language across courses and modules, and avoiding overlap with other sustainability concepts. Developing a standard vocabulary and terminology for NetZero may help students understand the objectives and the different approaches available better.

Emerging Theme 3: Teaching implementation and not just importance

The third emerging theme suggests that although universities are including NetZero and its significance in their teaching, they are not sufficiently preparing students to implement the principles of NetZero in creating new businesses. This lack of practical implementation instruction could pose a significant challenge for future business leaders who will need to integrate NetZero principles into their business models and contribute to efforts to combat climate change. Participant A3 pointed out this gap, stating, "*I didn't see any [additional]*

support for those who want to start a business thinking about sustainability." The same participant also expressed further, "I don't know what kind of mentoring support or guidance that the university provides for start-up sustainability." Participant A2 also shared their ideas on the type of support students would like to see from universities, stating, *"I would want the university to give me opportunities like, make connections like networking. That could help a lot. And may be some funding if the idea is appropriate for NetZero emissions."*

While it is crucial for universities to teach the urgency and importance of NetZero and its role in mitigating climate change, students need practical instruction on how to implement NetZero principles in business models. Without this practical instruction, students may struggle to translate their understanding of the concept into practice, leading to the creation of unsustainable business models that contribute to environmental degradation. Participant A2 emphasized this need for practical instruction in their interview, stating, *"...may be hold sessions with them (students), like how their venture could turn into a sustainable venture. They (universities) could explain how it's good for the whole world and everything else about NetZero emissions."*

Participant B3 also noted the need for practical guidance in their interview, saying, *"They do teach us stuff like value proposition, marketing, finance, legal, all of which is super important, (but) I think they should do something on NetZero as part of that. I think there should be like guidance steps for how to get started, like places where you can look at where all the resources are."* In a similar vein, participant C3 mentioned, *"It's not something I sought out, it's not something very proactively offered (in the university) as far as I am aware of it, but I didn't seek sustainability in my business or what it means to be sustainable."*

To address this gap, universities could offer courses, workshops, and experiential learning opportunities that focus on the practical implementation of NetZero principles. Such interventions could cover topics like carbon accounting, green supply chain management, renewable energy, and circular economy models. Additionally, universities could create partnerships with businesses that have already incorporated NetZero principles to offer students real-world experiences in implementing sustainable business models.

Emerging Theme 4: Beyond classroom training

The fourth emerging theme suggests that universities rely heavily on classroom teaching materials to educate students about NetZero, but there is significant potential to broaden the learning experience beyond the classroom. The research suggests that universities should not rely solely on classroom teaching to educate students about NetZero. Participants in this study highlighted the need for additional activities that go beyond traditional classroom learning, such as guest lectures by alumni who have started NetZero businesses, networking events, and field trips to NetZero businesses in the local economy. These activities could provide students with valuable insights and practical knowledge on how to achieve NetZero goals in different contexts. One way to achieve this goal is to create opportunities and platforms for students to network with NetZero entrepreneurs. As participant A1 pointed out in their interview, *"I think they (university) need to move beyond merely teaching about climate change and rather sharing real-life examples of successful businesses which have done something significant about it, which can be shown to them (students) to show a way of how businesses can actually do it."*

Universities typically focus on the theory of entrepreneurship, such as case studies and business plans. However, students who plan to start their own businesses after completing the

course may lack the confidence that they are adequately qualified to do so, which could be a hurdle. Connecting students with NetZero entrepreneurs may help them gain insight into the successes and failures of implementing NetZero practices in the real world. This can assist students in comprehending the difficulties and opportunities associated with implementing sustainable practices in various sectors and industries. Furthermore, interacting with NetZero entrepreneurs can inspire students to consider their potential contributions to the NetZero movement in a creative way. As participant A2 mentioned during their interview, *"Ventures which are already working for sustainability development would help the students to know how it goes, like showing us hands-on how we can actually create a venture keeping in mind an idea of NetZero emissions."*

Additionally, networking with NetZero entrepreneurs can provide students with valuable industry contacts that can benefit their future careers. By establishing relationships with leaders in the NetZero space, students may be able to secure internships or jobs, gain mentorship, or identify new areas of interest to explore. As participant B2 noted in their interview, *"We have never had somebody saying consider the carbon footprint of your business. We have an entrepreneur in residence, we have had a lot of sort of investors come in, we've had a lot of business owners come in, and they've tackled multiple topics, but nobody talking in terms of carbon responsibility."*

Expanding the learning experience beyond classroom teaching materials to include guest lectures and interactions with NetZero entrepreneurs can be a valuable way to improve students' understanding of the practicalities of NetZero, provide inspiration and motivation, and establish valuable industry connections. As participant A3 pointed out, *"I do not know of any guest lectures or interaction with industry experts on the topic."* This highlights the current lack of such opportunities and the potential for universities to enhance the NetZero education experience for their students.

Emerging Theme 5: Working in silos

The phenomenon of "working in silos" refers to different individuals or groups within an organization working independently without adequate communication or coordination. In the context of university education on NetZero, it means that university student resources are not integrated and aligned with one another, resulting in a fragmented approach to achieving NetZero goals. There appears to be a lack of collaboration and coordination among different university resources aimed at helping students achieve sustainability goals. Many environmental clubs, research centres, and sustainability offices operate independently without proper communication or coordination, resulting in a fragmented approach to sustainability.

Although environmental clubs, research centres, and sustainability offices are available to help students achieve their sustainability goals, these resources often operate independently without proper coordination and communication. This can lead to students not having access to all the resources they need or being unaware of the resources that are available. For example, participant C2 mentioned in their interview, *"Socializing is not good enough because (we are) divided into three cohorts. It'll be good for us if we change cohorts, more socializing can happen, more networking can happen and we can learn from each other as to what is happening in other cohorts."*

Due to the absence of proactive communication, students may be unaware of relevant campus events, competitions, and initiatives related to NetZero. This lack of information may cause

students to miss out on opportunities to participate in relevant initiatives or acquire new knowledge about sustainability. As participant A3 explained in their interview, *"There are some parts of the university, accelerator that are organizing entrepreneurship and climate-related events, they haven't reached out. See, you are organizing all these helpful events about how to create a new business while thinking about sustainability and climate, but if you don't communicate this properly across all students, how do you think it is going to make a full impact?"*

In addition, students may not have easy access to the information they need to achieve their sustainability objectives due to the limited information accessible on demand. For instance, if a student needs information about a particular sustainability initiative or program, they may not know where to find it or it may be difficult to obtain. Participant B4 mentioned in their interview, *"I know that something would be available if I asked, but it was never part of the information provided beforehand...kind of curriculum or the university system itself that every student is communicated with, kind of making everyone aware of it..."*

The lack of integration and coordination of university resources, coupled with the limited communication and information available to students, can result in a fragmented approach to sustainability. This can hinder universities' ability to reach their NetZero goals and create a sustainable campus environment. To overcome this challenge, universities must prioritize initiatives that encourage collaboration and coordination among different resources to help students achieve sustainability objectives more effectively.

Recommendations

The research suggests that there is a need to integrate NetZero with entrepreneurship subjects, and to provide more case studies and teaching material that exemplify NetZero strategies in start-up businesses. By doing so, universities can help students to recognize NetZero as a business opportunity and equip them with the knowledge and skills they need to create profitable and sustainable ventures that contribute to the fight against climate change.

Teaching NetZero as part of entrepreneurship subjects will help students to see how they can create and grow businesses that are focused on reducing emissions and contributing to a more sustainable future. This could include, for example, developing new products and services that are more energy-efficient.

By teaching students how to think about NetZero from a business perspective, universities can help to foster a new generation of entrepreneurs who are focused on creating sustainable businesses and driving the transition to a NetZero future. Overall, teaching NetZero as a business case is an important approach for universities to take, as it will help to ensure that the next generation of business leaders and entrepreneurs are equipped with the knowledge and skills they need to create a more sustainable future.

The findings of the research suggest that universities need to take specific actions to help students recognize NetZero as a business opportunity and equip them with the knowledge and skills they need to create profitable and sustainable ventures that contribute to the fight against climate change. One such action is to integrate NetZero with entrepreneurship subjects. By doing so, students can understand how they can create and grow businesses that are focused on reducing emissions and contributing to a more sustainable future. This could

include developing new products and services that are more energy-efficient or building companies that specialize in renewable energy.

Limitations

This study is characterized by several limitations, which must be considered when interpreting the findings. Firstly, one of the main limitations of this research is the relatively small sample size used, which may affect limit the generalizability of the findings to a larger population. Therefore, caution should be exercised when extrapolating the results to broader populations, and further research should be conducted with larger samples to enhance the reliability of the findings.

Secondly, the study only focused on three universities located in the UK, which may limit the generalizability of the findings to other geographical regions or higher education contexts. Therefore, future research should extend the sample to include a more diverse range of universities and locations to increase the external validity of the study's results.

Lastly, the study relied on self-reported data, which may be subject to various biases, such as social desirability bias or memory recall bias. This may have impacted the accuracy and reliability of the data collected, which could have affected the study's results. Therefore, future research should incorporate a combination of objective measures and self-reported data to enhance the validity and reliability of the findings.

Despite these limitations, this study provides valuable insights into the role of university entrepreneurship education ecosystems in the creation of NetZero enterprises. Future research could build on this study by increasing the sample size and exploring other contexts. Additionally, researchers could consider using other methods, such as surveys or case studies, to complement the findings of this study.

Conclusion

Intrinsic to the notion that we are living in times of competing concerns, including climate change, food security and energy security, this research is topical and important for society. This study advances research on entrepreneurship education and brings new knowledge on the impact of entrepreneurial ecosystems in the context of climate change. The findings of this research address theory and practice alike. Building on the process-based perspective of entrepreneurial ecosystems (Spigel and Harrison, 2018), this research contributes to the literature in the field of entrepreneurship education. This research also informs practice by presenting recommendations for concerned stakeholders spread across society, including education providers, university management and policymakers.

Universities are crucial drivers of economic development and social change (Klofsten *et al.*, 2019), especially as global problems reshape socioeconomic landscapes and demand sustainable returns from universities (Graddy-Reed, Lanahan and D'Agostino, 2021). The appetite for finding ways through which entrepreneurship education in universities can play a role in addressing societal challenges around climate change has never been stronger. Addressing the challenge of climate change, the present study aims to explore how universities may gain ground in the race for climate action by assisting in developing new businesses built with climate action in mind.

We present that understanding sustainability should play a bigger role in the education of entrepreneurs at the university level. When applied to the study of entrepreneurship, sustainability learning can encompass a variety of topics, such as sustainable firm models, green technologies, social entrepreneurship, circular economy, and responsible management practices. By engaging in this manner, institutions can aid students in creating enterprises that are not only financially successful but also contribute to a more sustainable and just world. This may allow universities to assist students and alumni in creating businesses that are born NetZero.

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