Integration of Sustainability Awareness in Entrepreneurship Education

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Abstract: Compared to topics such as creativity and strategic implementation in entrepreneurship education, sustainability has not been profoundly emphasized in programs. This study seeks to fill this gap by examining cross-cultural differences between the Austrian and Taiwanese educational contexts in terms of sustainability awareness in entrepreneurship among students in higher education. To conduct the study, students from both Austria and Taiwan were interviewed after developing a procedure to cross-examine their activities in programs, workshops, and team projects. The results indicated that students’ perception of sustainability differed according to sociocultural background: Taiwanese students tended to prefer individual responsibility and action, whereas Austrian students were more aware of the impact of industry and food production on sustainability. Such an approach could help students in both Taiwan and Austria to attain a better understanding of the sustainability problems that require entrepreneurial solutions. The uniqueness of this study lies in its cross-examination and cross-comparisons of sustainability integration in entrepreneurship education in Austria and Taiwan. Such comparisons provide educators and policymakers the opportunity to engage in cross-cultural exchanges of knowledge and experiences from which they can learn and adapt.

Keywords: entrepreneurship education; sustainability; cross-national comparisons; Austria; Taiwan

1. Introduction

Entrepreneurship education seeks to equip students with the motivation, knowledge, and skills for entrepreneurial success in a variety of settings [1]. Conventional entrepreneurship education focuses mainly on creativity, economic, managerial, and financial issues for start-ups in business operations. Compared with topics such as creativity and strategic implementation in entrepreneurship education, sustainability has not been strongly emphasized in programs. Entrepreneurship education trains individuals in multiple skills [2], which are needed for recognizing business opportunities or starting new business ventures [3]. Considering global warming and climate issues, it is crucial for entrepreneurs to integrate social and environmental sustainability into strategic business models. Sustainable entrepreneurship adopts a holistic approach to venture start-ups, which consider environmentally, economically, and socially sustainable dimensions [4]. Economic development relies on the availability of environmental and social resources, which are becoming increasingly pertinent considerations for enterprises [2,5].

Although there has been much research on sustainability education, few studies have examined cross-cultural differences among students from various countries. This study seeks to fill this gap by investigating the cross-cultural differences regarding sustainability awareness between Austria and Taiwan. The specific countries targeted in the study were Austria and Taiwan, whose differences in terms of entrepreneurial education may be worth exploring. Bobek et al. discuss cultural differences between Austria and Taiwan: Cultural dimensions like institutional collectivism and in-group collectivism are more emphasized...
in Taiwan than in Austria [6]. By contrast, dimensions like long-term orientation and uncertainty avoidance are more emphasized in Austria than in Taiwan. The findings in Bobek et al. help explain certain cultural differences between Austria and Taiwan and provide a rationale for successful recycling systems on campuses in Taiwan due to institutional collectivism and in-group collectivism.

The objectives of this study include (1) determining the outcomes of integrating sustainable development into entrepreneurship education in Austria and Taiwan and (2) ascertaining the effects of the varying sociocultural backgrounds between Austria and Taiwan on entrepreneurship education outcomes. The contributions of this study include the following: (1) exploring the key constructs of sustainable entrepreneurship education based on a cross-examination of activities with sociocultural considerations and (2) providing novel insights into entrepreneurship education by taking Sustainable Development Goals (SDGs) into consideration. The findings in this study can not only fill a crucial gap in the literature but can also shed light on the sociocultural aspects of integrating SDGs into sustainable entrepreneurship education.

This study is unique in its attempt to examine cross-cultural differences between these two countries located in Asia and Western Europe. We anticipate that major differences should be expected between students from the two countries, considering the emphasis on recycling in Taiwan and considering the geographical and cultural differences between the two countries, with one being an island and the other being continental. The study is arranged as follows. Section 2 includes a review of the literature, which is followed by the methodology in Section 3, which describes how data was collected for the two countries. These sections are followed by a presentation of the results and a discussion of these results. Finally, the practical implications of the study are discussed in the conclusions.

2. Literature Review

Postigo et al. [5] analyze four lines of research describing the developmental stages of entrepreneurship education in different countries. They include studying the impact that entrepreneurship education has at the tertiary education level [7]; the analysis of the pedagogic instruments and methodologies used to teach entrepreneurship [8,9]; the research related to state-of-the-art entrepreneurship education [10]; and a report on practical experiences at different educational levels [11,12]. Vaughter et al. [13] conclude that based on their review of the literature on sustainability in post-secondary education, most research on the topic focuses on case studies rather than on comparing multiple institutions. Therefore, a meaningful step forward would include drawing on more interdisciplinary research for further understanding of sustainability.

Feng emphasizes the importance of interdisciplinary research in the field of sustainability education and the necessity of open attitudes, willingness to learn, and the ability to engage with different thoughts and opinions [14]. Vaughter et al. [13] describe the term sustainability as being multifaceted and varying in definition. Hermann and Bossle further argue that sustainability education has neglected entrepreneurial skills regarding critical competencies such as foresight, complex problem-solving, and interdisciplinarity [15]. Although entrepreneurship and sustainability education provide discrete learning objectives without plausible integration, major thematic commonalities in relation to interdisciplinary entrepreneurship education and sustainability education can be identified, including innovation design, entrepreneurship ecosystem support, and corporate/organizational aspects [15].

Shepherd and Patzelt offer a definition of sustainable entrepreneurship:

Sustainable entrepreneurship is focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society [16] (p. 142).

Based on this definition, entrepreneurship education can be seen as indispensable to countries where small and medium enterprises (SMEs) are crucial for economic devel-
opment. Austria and Taiwan are considered in this study because the vast majority of enterprises in their economies are SMEs: namely, 97.65% and 99.70% of the total number of enterprises in Taiwan (as of 2019) and Austria (as of 2018), respectively [17,18]. Entrepreneurship education is a success in these two countries because students are highly likely to be recruited by SMEs and also display a high tendency to form start-ups in their career development [19]. Crecente et al. examine the linkage between sustainable entrepreneurship goals (SEGs) and SDGs, where sustainable entrepreneurship fell within a broad category of circular entrepreneurship [20]. Edokpolor emphasizes the relationship between entrepreneurship education and the core values of sustainable development [21]. Education plays a critical role in higher institutions in equipping students with knowledge of sustainability in entrepreneurship through projects and programs [22].

Clark and Button describe a transdisciplinary education model of sustainability that links art, science, and community and university and K-12 students with shared learning opportunities [23]. They report that, based on an applied student-centered approach, all participants could expand their understanding of sustainability and gain a deeper and broader understanding of human–environment relationships and how humans impact natural resources. The participants developed their competences in connecting academic domains of knowledge and sustainability challenges. Kao et al. state that in addition to learning about sustainable development issues within school curricula, students are encouraged to participate in nonformal educational activities [24].

Education for sustainable development (ESD) has been emphasized by the United Nations Educational, Scientific and Cultural Organization (UNESCO). The Global Action Program (GAP) for ESD was launched at the World Conference on Education for Sustainable Development in November 2014 in Aichi-Nagoya, Japan. The GAP deploys a two-fold approach for ESD action: (1) integrating sustainable development into education and (2) integrating education into sustainable development [25]. Linking entrepreneurship to sustainable development will go a long way toward solving problems associated with sustainability. Furthermore, O’Brien outlines the three spheres of transformation, namely, the practical, political, and personal dimensions, as a heuristic device to identify leverage points for transformations of change processes that support the aspired sustainability target [26]. Furthermore, O’Brien concludes that to attain climate change reduction goals, all three dimensions of social transformations in terms of practical, political, and personal aspects must be recognized.

Corporate sustainability has been the focus of sustainable entrepreneurship [27]. With the GAP for ESD, sustainable development has been integrated into entrepreneurship education. Halberstadt et al. encourage educators to design service-learning frameworks for sustainable entrepreneurship through active participation [28]. Rashid states that entrepreneurship is the key to socioeconomic empowerment [29]; however, entrepreneurship education and training need to be reinforced with sustainability as specified in SDGs to fill the gap between research and practice.

A few studies have proposed approaches to integrate sustainability into entrepreneurship education. Shu et al. [30], through a perspective study, outline a novel sustainability-oriented framework revolving around creativity and innovation for entrepreneurship education in the Taiwanese context. Their framework considers a “thinker to doer” approach or direction for education, as well as a four-level structure arranged from basic to more advanced levels. The levels (beginning from the most basic to the most advanced) include the Thinker, which involves cultivating students through entrepreneurship education to think about the problems that can be solved through enterprises; UN SDGs, which refers to using the 17 UN SDGS as catalysts for enterprising ideas; the Advanced Structure for Entrepreneurial Education, where thinkers are inspired to care about SDGs; and the final state or goal of Doer, where students are transformed into entrepreneurs willing to create SDG-inspired start-ups geared toward solving urgent, worldwide problems. Furthermore, Rashid [29] presents a literature review on entrepreneurship education and SDGs and identifies several limitations in the literature and limitations to the proper advancement
of SDGs through entrepreneurship education: namely, a lack of literature on fragile states and demographic diversity; the non-application of entrepreneurship education beyond university students; and a limited focus on education technology, progressive approaches to education, and innovation in fragile states compared to those that were stable.

Hameed et al. [31] utilize a serial-mediation model to investigate the relationship between entrepreneurship education and green entrepreneurial behavior in an application of the resource-based view and flow theory. Their results indicate that entrepreneurship education encouraged environmental commitment, which in turn led "to university green entrepreneurial support, environmental motivation, and green entrepreneurial behavior" (p. 1). They also suggest a significant and positive relationship between entrepreneurial support and green venturing. Lopes et al. [32] in an interesting study highlight insightful differences, within the Portuguese context, between mainland and insular (i.e., island) university students in terms of their entrepreneurial intentions. They show that in insular regions, students were more likely to be encouraged by friends and family to set up businesses and that those in the mainland were more likely to believe that they possessed the skills to drive a business to success. Furthermore, students in insular regions were more likely to become entrepreneurs than mainland ones, as they saw entrepreneurship as a matter of "necessity," whereas mainland students viewed it as a matter of "opportunities."

Hameed et al. [33] in a study investigating how to achieve science, technology, and innovation in the UAE explored the role that entrepreneurship education played in evoking self-confidence, locus of control, and risk-taking propensity among university students. They suggest that students who develop self-confidence through entrepreneurship education have more positive attitudes and greater motivation. They also indicate that internal locus of control and risk-taking propensity through entrepreneurship education led to innovation, need for achievement, and motivation, as well as a link between high levels of fortitude and motivation through entrepreneurship. Additionally, Lans et al. [34] reveal that competencies such as “embracing diversity and interdisciplinarity, foresighted thinking, interpersonal competence, normative competence and systems thinking competence” (p. 43) are shared in common in terms of the overlap between the domains of entrepreneurship and sustainability.

Hermann et al. [35] present the results of classroom action research, in which they attempt to develop a conceptual framework to orientate sustainability education toward a more focused entrepreneurial outlook. They used a problem-based learning (PBL) approach to design a summer program course. Using student feedback, they indicate the presence of tension points regarding the integration of PBL learning principles for group formation and problem analysis and suggest early group formation and incorporating formative feedback into progressive problem analysis as solutions. Finally, Wade [36] explores the potential of migrant entrepreneurship education to achieve SDGs in the context of the Fresh Start program, an EU-funded project established to provide support for immigrants in Europe. He suggests that, among other things, more assistance is required in terms of language support for migrants, accessible child-care services, targeted microfinance, and greater flexibility in the benefits systems of European states.

3. Methodology

To examine the influence of integrating sustainability awareness into entrepreneurship education, we developed a procedure to cross-examine students’ activities in programs, workshops, and team projects. Then, students from educational institutions in Austria and Taiwan were interviewed. Entrepreneurship education in Taiwan has been initiated through a top-down approach, in which the government provides funding support for research in partnering universities in collaboration with industry, and this alignment is based on a closely monitored and well-regulated performance-based system [19]. Schools in Europe have advanced in entrepreneurship educational development. Furthermore, 15–20% of graduates in Europe have been trained in entrepreneurial practice, with the average length of entrepreneurship education being 10 years or longer [37].
Practical entrepreneurship training has been emphasized in higher education in Europe, while institutional teaching and classroom learning are implemented in Taiwan [38]. As mentioned in Kollmuss and Agyeman [39], social and cultural factors are influential external determinants that shape proenvironmental behavior. In this study, social and cultural influences were considered comparatively for sustainability integration in entrepreneurship education. Furthermore, sustainability can be linked implicitly with the institutional environment and communicated values and thus enhance students’ learning and understanding of sustainability, which can then be translated into proenvironmental behavioral changes [40].

In this study, the researchers attended higher education programs and observed students’ learning processes in entrepreneurship education. Entrepreneurship workshops were held for students studying sustainability. Students were informed of the researchers’ observations, and then formal and informal in-depth interviews were administered. The major research questions were as follows:

- What are the differences or similarities between attitudes toward sustainability awareness between Taiwan and Austria?
- Is sociocultural background relevant to sustainable entrepreneurship education?
- Can sustainability be integrated into entrepreneurship education for a better understanding of sustainable development?

The researchers observed students with different cultural backgrounds jointly and developed a framework based on cross-examination and cross-comparisons of students’ reactions and inputs in Austria and Taiwan. Semi-structured interviews with open-ended questions were designed. In-depth interviews were arranged in a friendly environment to allow researchers to have conversations with participants. An on-site translator was used to help the students in case they required brief interpretations of English terminology.

The researchers participated in entrepreneurship activities and in university programs in Taiwan and Austria to observe the students’ environmental actions and creativity in sustainable entrepreneurship on campus. Formal and informal in-person interviews were administered to examine sustainable awareness and perceived sustainable entrepreneurship in students’ career development. Well-organized events and workshops held in universities provided platforms for students to work on entrepreneurship projects with sustainability considerations. Through the observation of team projects and student interactions in the development of environmentally friendly products and services in workshops, the researchers provided feedback to the students regarding how sustainable entrepreneurship could be implemented. The number of students in events or workshops ranged from 35 to 247, and participants ranged from senior high school students to master’s students. The researchers observed entirety of each event or workshop and then interviewed the students to gain a deeper understanding of their sustainable awareness in entrepreneurship education.

The findings in this study did not only rely on students’ feedback and responses but also on the interactions between the researchers and the students, as well as between the researchers. In terms of cultural diversity, the findings based on cross-examination and cross-comparisons in the current study provide crucial information to integrate sustainability into entrepreneurship education in Austria and Taiwan.

Both the students’ environmental activities and the sociocultural aspects of entrepreneurship education were cross-compared in the current study. For in-person interviews, transcripts were coded in English. The codes were categorized to generate meanings expressed by students in sustainable entrepreneurship education according to the literature and to describe the connections between them using underlying phenomena. It was explicitly stated in the interviews that participants’ opinions and answers would be anonymous and used for research purposes only and that their answers would not influence their academic performance in any way. With the intent of obtaining deeper insights into their opinions and specific examples related to sustainability in entrepreneurship education, the interview atmosphere was designed to be friendly, relaxed, and conversational. All the in-
terviewees were allowed to express their opinions regarding sustainability and sustainable entrepreneurship. Based on their answers, additional follow-up questions were asked, and the interviewees were encouraged to further explain their opinions in depth.

Although the methods applied in this study were observational, the researchers physically attended all the events and workshops in both countries from start to finish as a unified research team to collect qualitative data. Environmental education in entrepreneurship programs in Austria and in Taiwan differs considerably from each other. With the intent of identifying how sustainability could be integrated into entrepreneurship education, the categorization of sociocultural considerations and institutional aspects was implemented. Typologies were constructed for entrepreneurship education to clarify educational challenges in sustainability in the current study.

4. Results

Table 1 lists the results from researchers’ observations after cross-examination of sustainability integration into entrepreneurship education within the context of varying sociocultural settings and of varying institutional perspectives between Austria and Taiwan.

The findings for the in-depth interviews with students in Austria and Taiwan were categorized into the broad constructs of individual, economy, and society following the definition of sustainable entrepreneurship by Shepherd and Patzelt [16].

The results indicated important differences in students’ sociocultural perceptions of sustainability between Taiwan and Austria (Table 1). Taiwanese students viewed sustainable behavior as their own personal responsibility and tended to believe that individuals were obligated to undertake sustainable lifestyles, even at great inconvenience to themselves. Austrian students also believed in personal responsibility. However, while Taiwanese students believed that policy makers had the responsibility to promote sustainable policies, Austrian students appeared to be more aware of the relationship between sustainability and industrial exploitation of natural resources such as water. The two following excerpts highlight this specific contrast between Taiwanese and Austrian students in terms of their sociocultural perspectives. Whereas the Taiwanese student emphasizes individual behavior, the Austrian student focuses on the relationship between sustainability and industrial or agricultural water usage:

*My parents talk about (electricity and water) utilities . . . depends on who is paying (for) those utilities. I feel it will cause inconvenience to others . . .* (Male Taiwanese student, TS# 3)

*Most water consumption is hidden in the food. We do not use much domestic water, but industrial and agricultural products consume a lot. Food waste is a critical issue.* (Male Austrian student, AS# 8)

The Austrian students’ responses revealed an understanding of hidden waste regarding energy and water consumption in food production. The following excerpts also reveal a similar contrast:

*Increasing the cost of utilities . . . More problem-solving concept in those concepts—more practical problem-solving situation(s) . . . also in schools (e.g., documentary movies—traveling the world to see how different people in different countries solve similar problems, and more debates held on this topic to help people better to understand the concept of sustainability).* (Male Taiwanese student, TS# 11)

*I see a behavior to save and recycle energy—collect the water to flush the toilet and also solar energy for the light.* (Female Taiwanese student, TS# 16)

Here, the Taiwanese student (TS11) believes that taxing individual or household behavior, such as increasing the cost of utilities, would contribute to solving the problem, and the second student (TS16) observes increasing sustainable behavior in daily life, such as collecting water to flush the toilet to save water. In short, one can say that Taiwanese students interpret individual responsibility as going out of one’s way to take individual actions in daily life to reduce their individual carbon footprint.
Table 1. Observations regarding cross-examinations of integrating sustainability in entrepreneurship education in the varied sociocultural settings between Austria and Taiwan.

| Researcher from Austria                                      | Researcher from Taiwan                                      |
|--------------------------------------------------------------|-------------------------------------------------------------|
| 1. Institutional perspectives                                | 1. Institutional perspectives                                |
| (a) Sustainability and entrepreneurship are underlying topics in education. | (a) Broad topics of SDGs are covered.                      |
| (b) Sustainability is addressed and discussed in many different subjects, but it is not a specific subject in the curriculum. | (b) Sustainability is smoothly woven into entrepreneurship education. |
| (c) Often these topics are addressed in thematic project days/weeks and project work that also involve relevant non-educational organizations. | (c) The consequences of environmental issues are emphasized. |
| 2. Cultural/social perspectives                              | 2. Cultural/social perspectives                              |
| (a) Behaving more sustainably is an individual decision.     | (a) Sustainability is a lifestyle.                         |
| (b) There is a shift in mainstream consumption toward introducing more sustainable offers (e.g., less packaging and no use of plastics) and advertising these. | (b) The young generation has the responsibility to stand out and make sustainability an urgent issue for policy changes. |
| (c) Several individuals and small businesses focus on sustainable production and behaviors. | (c) Only when environmental sustainability is achieved can society experience economic development. |

Integrating sustainability in entrepreneurship education in Austria

1. Institutional perspectives
   (a) Schools and families are more aware of waste management and recycling than they are of energy and water consumption management.
   (b) Excellent education in recycling, from primary school and introduction of daily activities related to reduce, reuse, and recycle.
   (c) University focuses on identifying and introducing new business models to preserve the earth and create sustainable business.

2. Cultural/social perspectives
   (a) Self-understanding and individual awareness of this topic increase implementation in everyday life.
   (b) Often children introduce these topics (trash sorting and separation) to family homes.
   (c) Rules and regulations in the cities help to enforce recycling.

Integrating sustainability in entrepreneurship education in Taiwan

1. Institutional perspectives
   (a) Recycling is a typical topic in environmental sustainability.
   (b) Entrepreneurship education emphasizes the economic and financial sustainability of business models.
   (c) The circular economy is introduced and sought for sustainable entrepreneurship education.

2. Social/cultural perspectives
   (a) Convenience is the lifestyle. Disposable packages and utensils prevail, especially for the young generation on campus.
   (b) Environmental sustainability is an urgent issue. Recycling packaging and disposable materials reduce waste.
   (c) Government and policy makers have responsibility for sustainability.

In Austria, there is increasing awareness of sustainability among the young. Many entrepreneurial ideas are related to sustainability; for example, opening shops offering only local, seasonal, and unpackaged produce. Furthermore, recently, a shift has been observed in regard to supermarket chains adopting policies to reduce wasteful packaging, especially those that utilize single-use plastics. This is also advertised in the media and helps to create awareness in individual households. Austrian students observed the high cost of sustainable alternatives and the potential of unscrupulous business to take advantage of the trend:
(The business opportunity) is when the sustainable alternative will cost the same or less as the unsustainable one. (Male Austrian student, AS# 5)

Laws and regulations . . . because every producer claims . . . “sustainable.” (Male Austrian student, AS# 1)

In Taiwan, sustainability is often marine related because the island is surrounded by water. Findings in Chen and Tsai [41] reveal that university students in Taiwan have incredibly positive environmental attitudes toward marine resources, which bodes well for the future development of ocean citizenship. One Taiwanese student mentioned the personal action she took to protect the marine environment:

I also learned that sunscreen hurts the life in (the) ocean, so I do not put on sunscreen before I go into the water. (Female Taiwanese student, TS# 6)

Another Taiwanese student went as far as suggesting that schools take a more proactive approach in promoting environmental sustainability by encouraging students to participate in direct action to protect the marine environment:

Schools should have the mandatory trip to clean the beach together—activity would help students to stop throwing the trash away and increase awareness about sustainability. (Male Taiwanese student, TS# 5)

The other comments of Taiwanese students demonstrated the large extent to which recycling has been successfully implemented in education and society in Taiwan:

In Taiwan, recycling education is excellent. (Male Taiwanese student, TS# 2)

I do what I can—I do recycle. I do take it apart and sort the rubbish, as it is very difficult to clean and separate the waste, so I separate. (Female Taiwanese student, TS#7)

Learning is not as effective as action: Action will change the mindset. (Female Taiwanese student, TS# 4)

We do a lot of thing(s) to achieve the sustainability (we recycle, do ecofriendly things . . . as opposed many people also do hurt the environment) (Male Taiwanese student, TS# 5)

Comments from students revealed how they understood that sustainability in entrepreneurship education provided new insight in terms of environmental awareness and encouraged the likelihood of effective action:

Self-understanding and awareness towards this topic would raise effectiveness towards implement(ing) this topic . . . (Male Taiwanese student, TS# 2)

Differences between the two countries in terms of institutional perspectives were also observable (Table 1). In Austria, there was a tendency for sustainability and entrepreneurship to be underlying topics in education. Furthermore, sustainability is addressed and discussed in many subjects; however, it does not feature as a specific subject in the curriculum. In addition, these topics are frequently addressed in thematic project days or weeks and project work that often includes relevant non-educational organizations. Other features included broad topics of SDGs being covered and smoothly incorporating SDGs into entrepreneurship education. By contrast, for Taiwan, the following observations were made. Schools, as with families, had greater awareness of waste management and recycling than of energy and water consumption management. Furthermore, Taiwanese educational institutions promoted and implemented first-rate education in recycling from primary school and introduced daily activities related to the concepts of reduce, reuse, and recycle. Additionally, the university focused on identifying and introducing new business models to protect the environment and create sustainable businesses. Other important characteristics of entrepreneurial education and sustainability in Taiwan include recycling featuring as a typical topic in environmental sustainability; entrepreneurship education emphasizing economic and financial sustainability of business models; and the circular economy being introduced and sought after for sustainable entrepreneurship education.
Students from both countries viewed sustainability as a critical issue for individuals, economies, and societies (Table 2). Whereas both Austrian and Taiwanese students in terms of individuals believed in individual responsibility and the power of taking actions to make a difference, the Taiwanese students were keener on carrying out that action in their daily lives, such as sorting out trash and using waste material for esthetic uses. In terms of economic implications, as mentioned earlier, Taiwanese students viewed reducing household use of utilities as a crucial means of achieving sustainability, whereas Austrian students believed that individual entrepreneurs should take responsibility for the sustainability or environmental consequences of their business decisions.

Table 2. Students’ inputs and reactions in sustainability for individuals, economies, and societies.

| Students from Austria | Students from Taiwan |
|-----------------------|----------------------|
| **For individuals** | **For individuals** |
| 1. We cannot be apart from society. Each individual is responsible for sustainability. | 1. Individuals learn sustainability from textbooks and course materials. |
| 2. Although some European states have more rigid regulations for material recycling, we as students can learn and compare various aspects of sustainability and then do our best for the environment. | 2. Separating trash and recycling has been commonly applied. |
| 3. Every action has its consequences. We need to think of long-term effects. | 3. Materials (e.g., a drink container) are considered as waste once their functionality is over (e.g., finishing the drink). However, if the container is esthetic, one could keep it and re-fill it and use it again. |
| 4. Convenience cannot be ranked above sustainability. | 4. Action makes a difference; therefore, more activities related to sustainability should also be introduced in schools to accompany traditional learning from textbooks. |
| **For economies** | **For economies** |
| 1. The circular economy has provided a solution for sustainability. Implementing policies for economies to become sustainable is critical. | 1. Sustainability means endless, continuous utilization of resources. For example, solar energy or looking into utilization of other alternative energy sources. |
| 2. Economic development should not be considered as the sole criterion to measure advancement. Sustainability has to be incorporated into economic development. | 2. Sustainability needs to take economic and cultural aspects into consideration. |
| 3. Modern societies are too materialistic. For economies to be sustainable, entrepreneurs should accept social responsibility in terms of sustainable business operations. | 3. Cutting costs on the usage of utilities is sustainable. |
| **For societies** | **For societies** |
| 1. Societies include individuals of different cultural backgrounds. It can be hard for a society to move toward a common goal regarding sustainability. | 1. Thinking about the next generation, we need to be considerate. |
| 2. Communication is crucial in educating the public to achieve societal consensus in sustainability. | 2. Urban areas use more electricity, in which rural areas are more conservative. |
| 3. Social inequality means that the wealthy can afford eco-friendly products and services, whereas others are unable to. | 3. Eco-friendly innovation is important for the society. |

On the societal level, there were also major differences between Austrian and Taiwanese students. The Taiwanese students saw sustainability as something that should be done for the greater good of future generations, and they also recognized urban versus rural culture as a major divide, with rural areas being seen as more conservative. The Austrian students, however, recognized divisions resulting from varying cultural backgrounds as critical. In addition, the Austrian students also acknowledged the impact of income equality by recognizing that those with higher incomes could better afford sustainability, such as the purchase of more expensive eco-friendly products.
5. Discussion

Omri states that in high-income countries, entrepreneurship initially deteriorates environmental quality, followed by improvement [42]. With both Austria and Taiwan being high-income countries, entrepreneurship students from the two countries are poised to improve environmental quality through sustainable enterprises. However, in Taiwan, the horizon of students needs to be expanded in terms of appreciating the relationship between food production and industry and environmental deterioration. Taiwan implemented the Environmental Education Act in June 2011 in an effort to enhance citizens’ understanding and responsibilities in the development of a sustainable environment [43]. Education reforms in Taiwan have focused on developing and encouraging curricula that can inculcate students with sufficient knowledge of sustainability. Entrepreneurship education is in its early stages; therefore, there is still an opportunity to integrate it with sustainability concepts. Figure 1 provides a graphical summarization of this study including objectives, methodology, results, and recommendations. Sustainable entrepreneurship education in Taiwan aims to enrich the concept from recycling to circular economy, while sustainable entrepreneurship education in Austria aims to enhance the action from conservation to sustainability.

![Figure 1](https://example.com/figure1.png)

**Figure 1.** Graphical summarization of sustainable entrepreneurship education in Austria and in Taiwan.

The literature suggests that entrepreneurship is positively related to green behavior and commitment to the environment [31]. However, educational institutions in both Taiwan and Austria should come up with more effective methods to teach entrepreneurship education to students. Shu et al.’s conceptual framework, which adopts a “thinker to doer” approach [30], may help in pushing entrepreneurship students in Taiwan toward achieving a more comprehensive understanding of sustainability and related SDGs in a manner that would inspire them to create green start-ups in response to solving these sustainability issues.

Furthermore, examining how environmental sustainability issues are included in several aspects of education in Austria would be useful for Taiwan. In Austria, the school is seen as a “learning space” as well as a “living space,” with the learning experience underlying the development of discipline-specific, interdisciplinary, social, and personal competencies for active participation within the community in both one’s career and private life [44]. Although there are no specific rules or acts to ensure that students
receive and gain enough environment-related knowledge, entrepreneurship education in Austria provides comprehensive training with an emphasis on sustainability. Analyzing the pedagogic instruments and methodologies utilized in teaching entrepreneurship, as has been examined in other investigations [8,9], would have presented a further interesting cross-comparison between the two countries and should be explored in future studies.

Examining the possibilities for creating desirable, viable, and achievable changes, a variety of disruptive, incremental, and collaborative or cooperative approaches to change need to be considered [26]. The practical sphere, being at the core of the model according to O’Brien, represents specific actions, interventions, strategies, and behaviors that directly contribute to a desired outcome. As this current study and previous research [45] have demonstrated, these refer to less energy consumption, less facility usage, cycling and using public transportation, beach cleaning, etc. In terms of sustainability, social businesses address future generations in three different ways: (1) action, that is, creating local employment; (2) process, that is, sustainable production, using environmentally friendly materials; and (3) effect, that is, creating consumer awareness or positive effects for suppliers [46].

As indicated in Figure 1, for island countries with limited natural resources, how to educate the young generation to be creative for the systemic development of a circular economy can be beneficial. For continental countries, how to educate the young generation to be proactive from conservation to environmental sustainability in entrepreneurship can be advantageous.

Sustainable entrepreneurship education establishes a solid foundation for the young generation to learn the practical importance of sustainability in addition to entrepreneurship in higher education. For countries with a relatively high percentage of SMEs, integrating sustainability in entrepreneurship education following UN SDGs is valuable in terms of both social and economic development.

6. Conclusions

A cross-cultural analysis of sustainability awareness between Taiwan and Austrian students was conducted. The results of this study revealed major differences between the two groups. Taiwanese students tended to be more aware of individual actions to reduce their carbon footprint, such as household recycling, whereas Austrian students were more conscious of the implications of food production and industry on the environment. The contrast in behavior could be explained by the emphasis on collectivism in Taiwan compared to Austria, where individual success and work are more important [6]. The collectivist culture in Taiwan may encourage students and others to engage in behaviors such as recycling plastics or reducing the use of electricity or hot water, which may result in individual discomfort or inconvenience, but which it is believed will contribute to the greater common good of preserving the environment.

Integrating sustainability into entrepreneurship education, including comprehensive plans in curricula, could serve as a crucial step in both countries to educate future entrepreneurs. The following are recommended for the incorporation of sustainability concepts into entrepreneurship education in the future:

1. Educational institutions in Taiwan should provide a broader spectrum of sustainability approaches in teaching entrepreneurship education. The most commonly practiced environmental behavior, recycling, should not represent the primary or most crucial form of sustainability.

2. Learning approaches that link entrepreneurship education to SDGs and that encourage students to move from thinkers to doers in terms of creating start-ups to achieve SDGs should be emphasized.

3. The circular economy provides a good model for material reduction. Developing a business model to reduce waste and to encourage reuse can be challenging. Modulating and promoting discussions in educational settings on the circular economy, different business models, and sustainable consumption can improve the conceptualization of sustainability in entrepreneurship education.
The uniqueness of this study lies in its cross-examination and cross-comparisons of sustainability integration in entrepreneurship education between two countries: Austria and Taiwan, where SMEs account for over 95% of enterprises in both countries [16,17]. However, the study included some limitations. Firstly, the study would have benefited from observing or evaluating students’ evolution in terms of their thinking and attitudes regarding sustainability. Secondly, students from a wider variety of Western and Asian countries were not included. In the future, a wider variety of countries should be included, and measuring students’ change in thinking about sustainability should be incorporated.

This qualitative study provides a good starting point for the subsequent further examinations based on the quantitative methodology, which will allow the significant differences and relationships to be quantified. To deepen the aspect of cross-cultural comparisons in the future, more countries should be included in the examination. Although in Taiwan high school students and university students were included in the study, the age gap between them was very small, as the high school students were students of the final year. Thus, by including both groups, the pool of information was extended and better comparable to the number of Austrian students.

Based on the current study’s findings, suggestions for future research topics include the following: (1) researching how sustainability can be communicated from genuinely interesting topics and creative essential issues in entrepreneurship education and (2) investigating the learning effectiveness of sustainability in entrepreneurship education: from creating awareness to changing behavior and improving sustainability.

Countries with different sociocultural backgrounds may have various challenges in integrating sustainability in entrepreneurship education, especially considering the COVID-19 pandemic and how it slows the economic growth for economies with a relatively high percentage of SMEs. When profit margins are diminishing due to the impact of the pandemic, the importance of sustainability in entrepreneurship education cannot be overemphasized, although financial sustainability may be the focus for SMEs to survive.

Further work needs to focus on the core competencies necessary to achieve entrepreneurial success through entrepreneurship education to expand upon the findings of other studies [34]. In addition, future cross-cultural studies should include more focus on accurately measuring the environmental knowledge and attitudes of entrepreneurship students in higher education, as well as analysis of the pedagogic instruments and methodologies used to teach entrepreneurship in relation to sustainability.

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