EDUCATION AND CULTURE IS THE PROPER ENTRANCE TO AFRICA "GREEN ENTREPRENEURIAL EDUCATION IN AFRICA"

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ABSTRACT

The idea of integrating green entrepreneurship into education has aroused much enthusiasm in the past few years. A myriad of effects has been stated to result from this, not only green economic growth, job and new investment opportunities creation and increased societal resilience, but also individual growth, increased university engagement, and improved equality. However, putting this idea into practice has posed significant challenges alongside the stated positive effects. The lack of time and resources, teachers' fear of commercialism, impeding educational structures, assessment difficulties, and a lack of definitional clarity are some of the challenges that practitioners have encountered when trying to integrate green entrepreneurship into education.

This study aims to clarify some basic tenets of green entrepreneurship in African universities, focusing on what it is, why it is relevant to society, when it is applied or not, and how to do it in practice. This study intends to clarify existing research in the domains of green entrepreneurship, education, psychology, and philosophy to provide some guidance.

Keywords: Green Entrepreneurship, African Universities, Higher Education, Definition.

INTRODUCTION

Africa and Egypt

Egypt and Africa have a strong historical relationship. Egypt is one of the founding countries of the Organization of African Unity in May 1963, which hosted the first African summit on its soil in July 1964. Thus, it has had a great role and a voice in all issues related to Africa. In the past, several African students went to Al-Azhar Mosque in Egypt to seek knowledge and education. Afterwards, they returned to their countries of origin to spread what they learned to their fellow citizens. Africa is the continent of the sun, the moon and the port of the blossoming stars. Moreover, its honorable land gave birth to time and gave the world its life and on its land, the immortal River Nile passes. It was and still is telling the stories of lovers and the mourners of long. Africa is standing with pride and with steadfast beauty in front of the winds of an oppressive time, a voice cheering for freedom, seeking emancipation, and rejecting humiliation.

The common features among the inhabitants of the African continent continuously increase, including various scientific, political, economic, social, and cultural fields. These fields are areas that must be developed to form pillars in support of Africa. It is truly a bold and important step to bring the African continent out of its dwarf borders and toward bright prospects. To achieve this, a door for educational integration on a scientific basis should be

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widely opened, serving the interests of all parties.

Green Entrepreneurship

After the global economic crisis, many countries emphasized the central role of entrepreneurship in boosting business activities. Governments have often allocated important recovery plans to help entrepreneurs, either in the form of loan guarantees, tax incentives, and research credit designed to boost innovation and systems that encourage self-employment. However, instead of being neutral in their industry targets, stimulus plans have often prioritized environmentally friendly investments, such as projects for improving green power, energy efficiency, water stocks, pollution control, waste reduction, and enhancing sustainable transport. These priorities are not new, in almost all cases, they have been part of long-term commitments toward environmental protection, supporting smaller enterprises, and innovation. Within this difficult economic context, many countries have increased public expenditure to revive growth while also taking the opportunity to orientate national economies toward long-term sustainability and "*green growth*." According to the United Nations Environmental Program (UNEP, 2009), South Korea invested 79% of its total economic stimulus package in "*green activities*" in 2009, representing almost 7% of its growth domestic product (GDP). This was followed by China and Australia with 34% and 21% of their stimulus packages going to "*green investments*," which corresponded to 5.2% and 0.9% of their GDPs, respectively. In this context, the study of green entrepreneurship went from mere "*fashion*" to a necessity for policy guidance. The organisation for economic co-operation and development (OECD) has been assisting efforts to foster green growth and guide relevant policy initiatives based on statistical evidence. As part of the OECD Green Growth Strategy, this chapter presents existing definitions for green entrepreneurship, past workings of the direction of quantifying its dynamics, and key findings across several countries, using existing OECD data for a selection of green sectors.

Definition

The concept of green entrepreneurship is relatively recent and has been receiving increasing attention since the 1990s. The interest in green entrepreneurship is not only reflected in the growing literature on the topic but also in the proliferation of terms used to identify the concept itself. As a field of study, green entrepreneurship is still in its infancy. For instance, Pachecho et al. (2010) observed some issues from the related fields, such as business economics, entrepreneurship, finance, and accounting, which are yet unresolved. However, O'Neill and Gibbs (2016) posited that entrepreneurs face problems in determining what undertakings constitute green entrepreneurship.

For instance, the Green Project (2012) defined green entrepreneurship as activities that address environmental/social problems/needs through the implementation of entrepreneurial ideas amid high risks and expectation of net positive impact on the environment and financial sustainability. The Green Project (2012) also described a green entrepreneur as one who starts and runs an entrepreneurial venture aiming to make processes and products green. Moreover, Sunny and Shu (2017) suggested that green entrepreneurship should be defined in terms of adopted technological line of production or firm's activities. Considering the premature stage of green entrepreneurship, to date, scholars have not reached a consensus on a universally acceptable definition (Demirel et al., 2019).

The green entrepreneurship is defined as a macro-level in business activity, where it

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closely linked to the general business cycle as opposed to the performance of an individual business sector.

According to Buck Consultants (2011), 60 % of businesses today are measuring efficiency through green programs, out of which, 78 % achieve power efficiency. In addition, two-thirds indicate heating/cooling and paper savings, whereas 60 % are cutting costs on water consumption. Hence, overall, approximately 69 % of the respondents indicated that they are already exploring green in their different endeavors, which represents an increase compared with that of before. In support of this, Khan (2015) opined that the only strategic solution to the problem of sustainability is for entrepreneurs to establish their businesses and rely on "*go green*" for prosperity and long-term survival.

The following are the most commonly used terms that describe green entrepreneurship: eco-entrepreneurship, ecopreneurship, environmental entrepreneurship, sustainable entrepreneurship, ecological entrepreneurship, enviro-preneurship, and sustainopreneurship.

Measurement of Green Activities

Notably, much of the literature on green entrepreneurship lacks substantial empirical analysis. However, the theoretical debate that has emerged during the last few years, caused by the growing interest in the topic, has undoubtedly contributed to a better understanding of the phenomenon.

Thus, Eurostat, the statistical office of the European Union, invited all European countries to propose a clear delimitation of green sectors based on the criteria included in the manual published jointly with OECD. OECD–Eurostat (1999) proposed a definition of the environmental industry following an output approach based on the following specific criteria:

"The environmental goods and services industry consists of activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems. This includes cleaner technologies, products and services that reduce environmental risk and minimize pollution and resource use."

This call resulted in several studies being added in the literature. The Hungarian Central Statistical Office (HCSO, 2005), Statistics Sweden (Brolinson et al., 2005), the Department for Environment Food and Rural Affairs in the UK (Mansfield & Thomas, 2005), Statistics Netherlands (Van Rossum & Schenau, 2006), and the Belgian Planning Bureau (Janssen & Vadille, 2009) attempted to measure the size and dynamics of the environmental industry following the recommendations of the OECD/Eurostat.

The United States Census Bureau (Becker & Shadbegian, 2008) already defined the environmental sector in the United States, in a very similar way to the OECD/Eurostat:

"The manufacture of products, performance of services and the construction of projects used, or that potentially could be used, for measuring, preventing, limiting, or correcting environmental damage to air, water, and soil, as well as services related to the removal, transportation, storage, or abatement of waste, noise, and other contaminants."

Authors reported the number of firms active in the industry, the number of employees, turnover, and occasional exports and value added. The delimitation of the environmental sector has also been discussed extensively within the United Nations (UN DESA, 2010), to establish a harmonized framework for the collection of environmental accounts.

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Considerable recommendations for the classification of activities have recently been proposed for consultation, including the consideration of the environmental relevance of producer intentions in cases where the technical nature of their activities is inconclusive. However, in the absence of stylized facts on the activity, the debate often appears distant from the current conjuncture, and hence, unable to offer tangible guidance to relevant policy initiatives. Many empirical works have been completed toward delimiting and measuring the environmental industry.

Measuring green entrepreneurship accurately is still complex, but figures on the evolution of the size of the green industry in each country can be used to illustrate rough entrepreneurial trends in these sectors.

Five Dimensions and Nine Indicators

Majid, Koe, and Racelis (2014) mentioned five entrepreneurship dimensions, namely, economics, social, ecological, cultural, and ethical. the five dimensions above are rather sufficient in explaining sustainable entrepreneurship because they extended the concept of TBL and different from the traditional concept which focusing on just one specific area, such as environmental or social. Nine indicators reflect these dimensions, which are deemed sufficient in measuring sustainable entrepreneurial practices. For example, the economic dimension refers to financial return from handles all economic outputs/externalities of the event firm and the individual event. This dimension is directly related to the size of investments and the current level of gross domestic product (GDP), meanwhile, the ecological dimension is represented by the protection of the environment. Culture is represented by business relations. Furthermore, the social dimension is delineated by community involvement, the value of products and services, and employment practices. Finally, the ethical dimension is covered by ethics, governance, and transparency. Notably, the dimensions and indicators identified in this model are general in nature, which means that they are not specific. Opera is a play that incorporates multiple elements, such as singing, acting, dancing, script, costuming, pictures, and body expression. The Scientific Opera into classroom promotes creativity and STEM knowledge (sciences, technology, engineering, and mathematics) together with art.

Green Entrepreneurship Education (GEE)

Education plays a crucial role in fostering the eco-entrepreneurial consciousness of future green innovators, entrepreneurs, and employees in the circular economy. The need for new green skills and attitudes is growing with growing consumer interest in clean and ethically sourced products. Moreover, appropriate educational content for the development of such skills in secondary schools is lacking.

Several Benefits that Students May Acquire from Green Entrepreneurship Education are as Follows:

1. Fostering environmental consciousness and eco-entrepreneurial mindset of the students in a highly practical and fun way.
2. Developing new skills and competencies required for green jobs and green entrepreneurship.
3. Providing an easy-to-follow structure that combines the acquisition of crucial knowledge on entrepreneurship and environmental stewardship with practical skills on how to develop one's sustainable business idea through learning-by-doing approaches that are part of the university's core educational

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paradigm.
4. Flexibilities and adaptabilities to various educational contexts.
5. First of its kind educational content on green entrepreneurship for higher education students.

Why do we have to start using GEE Today?

1. It will offer students an entry point to an exciting cross-cutting topic with vital significance for human societies today.
2. It will allow the use of a range of innovative teaching techniques that improve students' motivation.
3. It can inspire them to take personal action and solve some of the world's most pressing challenges by developing their own sustainable business ideas.
4. It will also increase their knowledge on issues, such as climate change, depletion of natural resources, pollution, biodiversity loss, soil erosion, circular economy, sustainable business modeling, sustainable solutions, and green entrepreneurship itself.
5. It will improve teaching skills by utilizing new technologies.

The Mission of Green Entrepreneurship Education

1. To create educational tools that will support university students in fostering a "*sustainability-conscious entrepreneurial mindset*," which includes all the features of the entrepreneurial mindset (tolerance to risk and uncertainty, ability to accept failure and learn from it, self-directed learning, and bias toward action, intentional curiosity, and creative confidence).
2. To observe through the prism of a sustainability mindset characterized by holistic thinking, an environmental and social ethic that respects the value of all living things, responsible consumption, cooperation and teamwork, full-cost accounting, democracy, and adherence to the precautionary principle, which are also likely to define the life of future generations.
3. Climate change, the depletion of natural resources, air pollution, loss of biodiversity, deforestation, degrading of soils, and others are related to an eroding base of the quality of ecosystem services that nature can offer, which can have dire consequences for humanity. Exploring the reasons for these and the possible solutions from the point of view of business is at the heart of the GEE.

Green Entrepreneurship Education Objectives

1. Allow students to experience and become imbued with the principles of nature as a source of life and inspiration to develop their green mindset as future entrepreneurs.
2. Develop new skills and competencies required for green jobs and green entrepreneurship.
3. Improve young people's understanding of the new realities of the world of work and business.
4. Improve teachers' performance in delivering high-quality education that combines face-to-face and online teaching strategies.
5. Provide a balanced mixture of knowledge and activities within the "*green*" and the "*entrepreneurial*" domain so that students have a desire of launching a green entrepreneurial venture (not necessarily their own company; they can apply the principles of green entrepreneurship in a large company or even public administration they work for and feel prepared to do it).

Proposal of Green Entrepreneurship Education

1. This approach ensures that each student is fully aware of the issues of society and can contribute to solving them "*each in their specialty*" using a combination of skills acquired through new educational programs that will utilize different teaching methods and techniques.
2. The development of learning materials on "*Green Entrepreneurship*" and PowerPoint presentations and educational materials, such as, video lectures and online courses are part of this approach.
3. Instead of traditional lectures face-to-face, this approach performs lectures with open debates and simulation games, as well as roundtable discussions in which the issues of society will be simulated; each student needs to become an expert in solving critical issues.

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4. Specific tasks will model the case and study the problem/solution simultaneously, ensuring several achievements of the issue in various aspects of life, economic, health, industrial, agricultural, and social.
5. This proposal aims to develop the skills of African universities students in all disciplines to solve environmental problems and contribute to the creation of green life in African societies aimed at imposing green life on the future reality of community life through the following: green buildings "*with energy and water efficiency*," eco-friendly paint and coatings, growing food without using chemicals, green health for humans, animals and plants, green protection of antiquities and archaeological sites, green business and management, green thinking and acting, green synthesis, green water, soil, air and ecosystem, and green technology.

Work program

The work program of the present GEE is divided into four major paths, all of which aim to improve the mindset of the students toward the sustainable development of African societies through the present educational program. These paths are as follows:

1. **Path I** intends to provide knowledge about environmental issues by providing theoretical fundamentals and the recent scientific solutions for its problems.
2. **Path II** is proposed to improve entrepreneurial skills for the students by providing facts about entrepreneurship and supporting individuals to become successful entrepreneurs.
3. **Path III** is adopting ideas and knowing opportunities, aiming to foster entrepreneurial ideas coming from different fields, and also support individuals without experiences with entrepreneurship or management, in sharing, spreading, and eventually also commercializing their ideas.
4. **Path IV** aims to encourage green entrepreneurship. This part deals with the topic of green entrepreneurship, which is a sub-discipline within the field of entrepreneurship.

Path I: Environmental Issues: Initially, the objective of this path aims to teach the students from different specialties, regardless of their background or knowledge base, the environmental problems and their relation with human activity. Consequently, this path aims to improve and modernize the awareness of students about important environmental issues such as the following:

1. Find Ways to Reduce Green House Gases GHG Emissions
2. Conserve Energy, Water, and Usage of Other Critical Resources—Natural or Manmade
3. Minimize Solid Waste Generation and Reduce Costs of Landfills, Create Local Compost Piles from Organic Waste
4. Innovate in the Area of Agriculture to Evolve New Techniques that Minimize Water Usage
5. Reduce, Reuse, and Recycle
6. Increased Recycling-Paper/Glass/Plastics/Styrofoam/Aluminum Cans/Electronics/Batteries
7. Develop and Increase Use of Renewable Energy
8. Prevent Underground Water Pollution, Air Pollution, and Soil Pollution and Increase Availability of Potable Water
9. Eliminate the Usage of Fluorocarbons and Prevent Methane Emissions
10. Produce Energy Efficient Devices
11. Increase Use of Bio-degradable Materials
12. Eliminate Unnecessary Transportation and Travel
13. Adopt Organic and Vertical Farming with the use of Renewable Energy Sources

Path II: Education to improve entrepreneurial skills. This path aims to support students in advance of a "*Business Model Work*" It is an evaluation basis before and after study in the GEE program. In this regard, gaining theoretical knowledge in different business areas is emphasized (market analysis, financing, planning, strategy, innovation, entrepreneurship, and others). This path also supports the competencies in planning and management, coping with uncertainty, and

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working with others. Therefore, students are supported in creating a whole business around their initial ideas. In addition, they will have a sound and profound knowledge in the domain of entrepreneurship and will have acquired a host of crucial entrepreneurial skills and competencies necessary for pursuing a successful future. Hence, students do not only recognize an important need in the Egyptian or Arab market but also know how to satisfy this need.

Path III: Adopting Ideas and Knowing Opportunities. The course is delivered through an "*Idea Competition*" (IC), where everybody is allowed to submit ideas from various fields. The students learn how to write and present ideas using different tools. Furthermore, theoretical inputs are provided with the tools "*Opportunities*" and "*Decision Maker*," making students familiar with the fundamentals of entrepreneurship. The outcome of this path, and a base for assessment, is the tool "*Final Project-Business Plan*," where students have to work out a business plan and present their ideas formally and reasonably. Generally, through this course, students can improve their creativity and learn how to spot changes on the market. They are supported in framing valuable ideas and stimulated to turn and translate these ideas into visions. Therefore, throughout the course, particularly competence area, "*Ideas & Opportunities*" is embraced and emphasized. A focus is on how to take the initiative and how to work in a team and profit from the experience of peers and others, for example, external factors involved (ability area "*Into Action*"). Moreover, students' motivation is strengthened by fostering their self-efficacy and awareness (ability area "*Resources*").

After this part of the project, students will be able to officially present their ideas in front of investors, customers, organizations and more, using an elaborated and well-thought-out business plan. This step will bring entrepreneurial thinkers closer to the goal of commercializing their innovative ideas.

Path IV: Encouraging Green Entrepreneurship. This path deals with the topic of green entrepreneurship, which is a sub-discipline within the field of entrepreneurship. This kind of entrepreneurship highlights the social value and the social purpose of entrepreneurial activities. Furthermore, it includes different services, for example, food and water provision, education, and medical services for people in need. Thus, the path particularly seeks to raise the capability area "*Ideas & Opportunities*."

The target group of this path is individuals with ideas that foster a green purpose, independently of their background or knowledge base. Furthermore, this path is open for individuals interested in the topic of green entrepreneurship in general, and for business students who like to deepen their understanding within the broad area of entrepreneurship in general. This part aims to do the following:

1. Encourage students from different backgrounds to foster green purposes with entrepreneurial activities.
2. Embed students with a more social entrepreneurial mindset.
3. Stimulate students' engagement with their countries by building knowledge.
4. Promote green entrepreneurship through projects with and for the countries involved.

Specific Activity: Suggesting Courses

1. New Approach of Recycling Biomass Wastes Using Nano catalysts, Nanotechnology
2. Applications in Water Treatment
3. Toward a Green World: The Power of Nanotechnology
4. Biodegradable Materials

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5. Significance of the Greening Agricultural Education in Egypt
6. Sustainable Building Materials
7. Environmental Geology
8. Transport & Traffic Environmental Hazards
9. Green Chemistry Principles and Entrepreneurship Education
10. History of African Environmental Sciences
11. Geo-Diversity, Geo-heritage, & Geo-conservation
12. Green & Sustainable Marketing
13. Creativity & Inspiration
14. Encouraging Green Entrepreneurship
15. Small Green Business Management & Marketing
16. Chemistry Entrepreneurship: Toward Job and Wealth Creation
17. Types and Preparation of Biocompatible Materials
18. Environmentally Sound Management of Hazardous Wastes
19. Fundamental of Agribusiness Entrepreneurship for Responsible Innovation
20. Natural Resources (NR) & Sustainable Developments
21. Product Life Cycle Management
22. Specific Activity: Suggesting Courses

Indicators

1. To assess the improvement of the motivational approach toward GEE. Quantitative indicators, such as grades earned in practical oral assessments focused on the green entrepreneurship approach, will be implemented to evaluate students.
2. The number of students who knew about the initiative and their desire to enroll is considered as a quantitative indicator of the success of the project.
3. Questionnaires and interviews will be conducted with students and their tutors during activities of the project: the results will be analyzed and illustrate whether the project improved the knowledge of the students and whether they will adopt the approach.
4. Competence tests, assessments, observation charts, focus groups, precise initial situation assessment, criteria for success, and quantitative objectives for success are established according to universal standards.

Impacts

Entrepreneurship education programs are based on the assumption that entrepreneurial intentions and skills can be taught and learned (Clark et al., 1984; Gorman et al., 1997; Peterman & Kennedy 2003; Pittaway & Cope, 2007; Hamed & Nassar, 2021). Entrepreneurship programs are expected to influence students' awareness of entrepreneurship as an alternative career path to paid employment and provide students with the skills needed to start and successfully run their businesses.

Based on the multiple skills that students acquire from entrepreneurship education, as we mentioned previously, so this type of education is considered an investment in human resource that leads to job engagement, commitment by introducing all policies and process for higher productivity.

An often applied approach to assess the expected impact of entrepreneurship education is the comparison of entrepreneurial intentions of students who attended entrepreneurship courses to the intentions of an appropriate control group without entrepreneurship education.

Through the practical methodologies, the support of the facilitators, and the program contents, they develop their skills as they have to put them into practice. Those skills are not taught by the tutors. They are seized by imitating the behavior of the trainer because they have to learn by themselves, with their mistakes and conquests.

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Putting in practice a renewed teaching paradigm, the tutors consider that the best way of learning is actually doing it to reflect on the process and the result and doing it again until students understand.

In addition to business skills that students will develop, other structural skills include self-confidence, unique thinking, planning, opportunity seizing, relational skills, know-how, responsibility, use of IT, and teamwork.

Those skills can be regarded as entrepreneurial because such skills are necessary for being an entrepreneur; however, they are important in all areas of life.

Life skills are those skills gained through the program, which is important because they are "*skills for life*" that "*they can take with them forever*." These skills will not be mentioned directly in the class, but they will be progressively introduced. Therefore, students were not conscious of what they were learning in their lives, but education to be an entrepreneur is a holistic learning process. It requires individualized work, an active role, and confidence about them and the possibilities for progressive and open learning, including promotion of prospective and positive thinking about the future.

Students are expected to recognize that they become more aware of the possibilities for their future. The concept of success is, with no doubt, to give them a "*sense of future*," as the personal development of young people is the most motivational, emotional, and immeasurable impact they could have. Effectively, when self-confidence is developed, all the other skills might also emerge.

The skills are mobilized and integrated into the various contexts of life, but they are also influenced by personal characteristics, such as self-confidence and the image that each person has of himself. Self-esteem, including the feeling that they can do it, is the major achievement that also might have an impact on other areas of life and self-continuous development.

Entrepreneurial education also affects social inclusion. All students are expected to feel motivated to continue studying. Moreover, they may all want to continue working, or those who did not might want to start. Entrepreneurship education is a strong platform for impact investing, after all, the essence of sustainable investment is to create a better world for the future than the world we inherited.

On the other hand, this work will open new areas of research for researchers of all disciplines to study the link between the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught through green education, which extends to the level of motivation they have to learn and progress in their education.

CONCLUSION

In the present proposal and in the light of the future green transition of African countries, the promotion of pro-environmental behavior is an important aspect in promoting a sustainable mindset in entrepreneurial students, which is one of the purposes of entrepreneurship education.

The current study supports the essential competencies necessary for future green entrepreneurs, and environmentally friendly solutions, which are becoming increasingly popular and attractive. In addition, the innovative technologies and digitalization of business processes will provide wider possibilities for entrepreneurs to be environmentally oriented.

As teaching is a creative process, which allows the latest theoretical achievements and their practical applications to be combined, this study may be considered an introduction to the sustainability of entrepreneurial education and acquisition of green business activities in the study process. Teachers with previous experience in teaching entrepreneurship as well as green

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education will be further contacted to enrich the GEE. The program of the present GEE is divided into four major paths, all of which aim to improve the mindset of the students toward the sustainable development of African societies through the present educational program. Thus, the self-assessment of students' knowledge at the beginning and end of the study courses on the green entrepreneurship allows judging the sustainability of the chosen methods.

Assuming the topicality of the green and circular economy in recent years, the promotion of a green entrepreneurial mindset amongst students has to become a multi-disciplinary issue, which is included not only in the specific specialized study course of Green Entrepreneurship but also applied widely. Particular topics of green concepts have to be included in the syllabus of other general and specialized study courses of the bachelor.

The topic of green entrepreneurship is a complex concept but will become increasingly important in everyday decisions at all levels of businesses and even households. Thus, the demand for education about green and circular economy and developing appropriate skills and abilities will increase.

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