

**PROMOTING ENVIRONMENTALLY SUSTAINABLE BUSINESS IDEAS AMONG
TERTIARY STUDENTS: THE CASE OF COURSES AT DAR ES SALAAM TUMAINI
UNIVERSITY**

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ABSTRACT

Dar es Salaam Tumaini University (DarTU), formerly known as Tumaini University, Dar es Salaam College (TUDARCo), in its strategic plan 2020/21 – 2024/25 focuses on innovation and entrepreneurship in the growth of developing nations like Tanzania, especially in creating an informed and responsible citizen by preparing students for personally rewarding and socially helpful jobs. This focus is rooted in its understanding on how entrepreneurship and innovation are crucial forces behind economic expansion. In achieving this, DarTU, through the School of Business Studies (SoBS), Department of Marketing and Entrepreneurship, established two courses; MGMT 225 Innovation, Entrepreneurship and Enterprise Development; and MGMT 311 Harnessing Entrepreneurship and an Innovators Mindset. These two modules are taught to students in all Schools at the University. One of the focus of this course is to enable students to come up with business proposals that promote environmentally-friendly business, to address the sustainable development goal (SDG) 8; Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Special focus was on target 8.1 Sustainable economic growth, and target 8.6 Promote youth employment, education and training. This paper presents the top five businesses that adequately focused on environmentally-friendly business. The paper employs a descriptive research design, and selects the top five, out of 205 business model canvases which focused on environmental sustainability. Businesses were rated according to the Canadian Youth Innovation Fund (YIF) criteria for environmental inclusion in a business model canvas. A discussion follows the presentation, where it shows that these businesses, among other things, innovative ways of cleaning plastic waste, restore health to water ecosystem, create businesses that add value to waste and re-use paper instead of throwing it away after use. The study recommends other higher learning institutions to adapt the methods of teaching and including environmental aspects in teaching innovation and entrepreneurship courses to their students.

Keywords: Innovation, entrepreneurship, environmental businesses, sustainability, higher learning institutions.

1. INTRODUCTION

The purpose of higher education is to create informed and responsible citizens as well as to educate students for personally rewarding and socially helpful jobs. Promotion of entrepreneurship and innovation through higher learning institutions would significantly contribute to the development of nations like Tanzania. Cognisant of that innovation is a crucial force behind economic expansion, the Dar es Salaam Tumaini University, clearly states in its Strategic Plan (2020/21-2024/25) that it aims at equipping their students with “the ability of graduates to convert their ideas

into commercial products or services and start businesses to address their local market needs, promotes self-employment and job creation.”

In achieving this, Dar es salaam Tumaini University established two foundational courses in their second year, second semester, and third year, first semester, to promote innovation and entrepreneurship across all Schools. These courses are MGMT 225: Innovation, Entrepreneurship and Enterprise Development and MGMT 311: Harnessing Entrepreneurship and an Innovators Mindset. The courses were created in a way that requires students to create and present a business pitch at the conclusion of the semester. They should be able to illustrate the societal issues in their proposal and offer a creative fix that the locals will be ready to pay for. In addition to competency-based training, which sharpens skills and knowledge and equips students for a successful start-up, students received training on intellectual property, funding, and marketing. Three main ideas covered in these classes were creating environmentally sustainable enterprises, addressing societal issues, and promoting gender equity and equality in the workplace.

This paper aims to establish the role of these courses in facilitating the establishment of businesses that promote environmental sustainable businesses. The businesses should be able to turn a mere ideas into marketable products or services that satisfies local market demands, promotes self-employment and job creation, and at the same time promote environmental friendly businesses in some way.

1.1 An overview of MGMT 225: Innovation, Entrepreneurship and Enterprise Development and MGMT 311: Harnessing Entrepreneurship and an Innovators Mindset

The course MGMT 225: Innovation, Entrepreneurship and Enterprise Development enables students to an understanding of what innovation and entrepreneurship means, and their applicability in the Tanzanian context. The content also contextualizes features of small enterprises and entrepreneurship through the course design. Students are oriented on how to identify social needs and difficulties and turning them into business possibilities by coming up with solutions and applying the knowledge and abilities they have acquired at the university, either in the classroom or through other means. The process of turning problem-solving into a business endeavour expects to lead to the creation of jobs for oneself and others as well as the conversion of knowledge into useful information. Some of the topics within the course include: the entrepreneurial ecosystem in Tanzania, business plan development; family business and succession planning; gender and entrepreneurship; corporate entrepreneurship; innovation; business environment and opportunity identification; business start-ups; application of information technology in entrepreneurship; and management of small and medium enterprises.

MGMT 311: Harnessing Entrepreneurship and an Innovators Mindset on the other hand, is a hands-on course, where students now create their respective businesses. The primary goal of the course is to equip students with implementable business plans and business model canvases (BMCs) so they can run a successful business. Students are expected to gain the practical skills necessary to turn the process of addressing problems into a business endeavour that can lead to both, their own and others' employment. It also gives students the chance to cultivate and use a

creative mindset when coming up with business ideas, as well as practical skills and a framework to help them develop, assess, and test these concepts. The main goals of the courses are to assist students in gaining access to technology, networking opportunities, market-relevant skills, and an innovative mindset and entrepreneurial abilities. With permission, the course has been modified from the EQWIP HUB curricula created by Canada World Youth (CWY) and Youth Challenge International (YCI). The information is divided into five sections: entrepreneurial characteristics and innovators' mind-set, finding a good business idea, marketing, business operations and money matters. At the end of the course, students are expected to have a completed Business Model Canvas (BMC), enabling them to have a ready-to-launch business. This course's primary goal is to give students the ability to develop and assess business ideas.

Delivery of the courses was through active learning pedagogy, which include videos, simulation activities, games, excursion visits, role-playing, group work, group presentations, individual study, individual presentations, large group discussions, question and answer sessions and utilization of technology to mention a few. There was a timetable for each class, and course instructors were assigned different courses to teach in the five Schools at the University. There were three main issues that were incorporated in the teaching process:

- a. How well does the business idea address a societal problem that people would be willing to pay for?
- b. How well does the business idea address gender equality and equity? And
- c. How well does the business idea address the issue of environmental sustainability?

Assessment is Coursework (40%) and University examinations (60%). This paper looks at the third question: environmental sustainability. The last two questions were not compulsory, but they were thoroughly taught in order to create awareness and assist students to understand the importance of incorporating those elements in their business ideas.

1.2 Incorporating Environmental Sustainability in the Course

Higher learning institutions are important stakeholders in creating and promoting sustainable entrepreneurs, who can innovate and come up with new solutions to social and environmental problems that are more efficient than the public sector. Promoting sustainable businesses that can be scaled up, will amplify the 17 sustainable development goals (SDGs) (Rahdari et al., 2016). The SDGs were introduced by the United Nations in 2015 to mobilize global efforts toward sustainable development by 2030. Zooming in on the sustainable development goal (SDG) 8; which states: promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all, two target are key in this paper. Target 8.1, which focuses on sustainable economic growth, and target 8.6 which looks on promoting youth employment, education and training. This paper presents the top five businesses that adequately focused on environmentally-friendly business in line with target 8.1 and 8.6 in mind.

Aligning with the Consortium for Entrepreneurship Education (2008), which notes that entrepreneurship is not just about teaching someone how to run a business, but also about fostering critical thinking and self-esteem, the delivery of these two courses incorporated the aspects of environmental sustainability, by defining sustainable businesses that are characterized by being measurable; as they offer social and environmental value while generating economic

returns (Saebi et al., 2019).

Incorporating environmental sustainability component in innovation and entrepreneurship ventures is not a new phenomena. In their study, Bruksle, Chwallek, & Krastina (2023) titled that was conducted at Lapland University of Applied Sciences, FH Aachen University of Applied Sciences and Turiba University noted that Sustainable entrepreneurship education development includes key aspects that should be considered across disciplines - deep understanding of the complex interplay between economic, social, and environmental issues, encouraging the use of innovative solutions to address social and environmental problems, and promoting a multi-stakeholder approach to entrepreneurship. Additionally, sustainable entrepreneurship education should aim to create a culture of sustainability that encourages problem-solving approach, values ethical decision-making and social responsibility.

This was observed throughout the classes, where students were encouraged to ask themselves the following questions: *Does my business help the environment in any way? Does it harm it? Where do my inputs come from and how does that affect the environment? Is the business using renewable resources? Is waste from the business being kept to a minimum? Is waste being properly disposed of?* Answers to these questions were supposed to be clearly answered during the presentation of their business model canvas. In addition to the questions, students were presented with various scenarios that showed a clear distinction between sustainable and non-sustainable businesses. These included the use of plastic throughout the value chain, acceptable and unacceptable disposal of waste from various types of businesses and how some businesses use trash as their core component in playing their part in cleaning the environment. Example of such businesses include a videos of “Trashy bags” from Ghana, who use plastic wraps on water and other products to make fancy handbags, bottle brick business in various parts of Africa, where bottles are used as bricks for housing and plastic pavements from Uganda to mention a few.

There were also games and role playing on how to determine environmental friendly businesses. Groups were assigned scripts that they had to play out in class, and in large group discussions, students were to identify the environmental related problems, and how they would address those to keep the business going, but promote sustainability at the same time, without affecting the profit margin. These scripts were on use of plastic wraps on clothes and general packaging, preferring paper business cards over laminated business cards, sorting hotel waste to re-sell food item as animal feeds, re-use of plastic bottles and proper disposal of used cooking oil to mention a few.

2. METHODOLOGY

2.1 Research Design

This paper employed descriptive research design. The goal of descriptive research is to precisely and methodically characterize a population, circumstance, or phenomenon. It can respond to inquiries about what, where, when, and how, but not why. When the goal of the research is to discover traits, frequencies, trends, and classifications, descriptive research is a suitable option (McCombes, 2023; Rao, 2018). Based on the education students received, the paper describes the top five businesses that focused on environmental sustainability.

2.2 Research Population

This study assesses 857 students who studied the course in two consecutive academic semesters of 2022/23 and 2023/24. These students are from four main Schools; School of Business Studies, School of Education and Human Development, School of Humanities and Social Sciences, and School of Law and Justice at the Tumaini University Dar es Salaam College – TUDARCo. Table 4.1 shows the population of the study:

Table 4.1 Population of the Study

SN	Programme	Total
1	Bachelor of Business Administration (BBA)	94
2	Bachelor of Human Resource Management (BHRM)	116
3	Bachelor of Mass Communications (BMC)	139
4	Bachelor of Arts in Library Information Studies (BALIS)	32
5	Bachelor of Information Management (BIM)	51
6	Bachelor of Arts in Education (BAED)	69
7	Bachelor of Laws (LLB)	195
8	Bachelor of Laws Evening Session (LLBE)	161
	TOTAL	857

2.3 Scoring Matrix

The first cohort had 857 students, a total of 205 business model canvases were presented in groups by students. Students were directed to form groups between three and five individuals, come up with a business and present the Business Model Canvas as a group. While teaching the course, there was emphasis on coming up with business that provides an innovative solution to an existing problem in the society, for which the society would be willing to pay for. There was also an emphasis of incorporating gender equality and gender equity in the businesses and environmental sustainability. Sixteen businesses had elements of environmental sustainability. This paper aims to present the top five businesses that exhibited awareness and applicability of environmental sustainability on their business model canvases. The criteria used to select these top five businesses were adapted from the Canadian Youth Innovation Fund (YIF) scoring matrix, to establish the most environmental friendly responsive business. These criteria are as follows:

Point	Meaning of the Point
0	The Plan makes no mention of the environmental issues or impact of operations and does not indicate any environmental management plan
1	The applicant indicates an awareness of environmental issues that might be impacted by their business, but there is no operational plan and environmental impact is not the main vision or value proposition for the business.
2	The Plan indicates favourable attitude towards environmental management and has

	indicated potential small scale measures to reduce the negative impact of the business. However, environmental impact is not the main vision or value proposition of the business.
3	The Plan indicates favourable attitude towards environmental management and has indicated small to medium scale measures in early stages of the plan to mitigate negative environmental impact and contribute to sustainable operations. Environmental impact is taken into consideration for the vision of the business.
4	The Plan indicates favourable attitudes towards environmental management and has indicated a number of small to large scale measures in early stages of the plan to mitigate negative environmental impact and contribute to sustainable operations. Environmental impact is considered an important part of the vision of the business.
5	The Plan’s vision focuses on the green economy, and has a tangible plan to carry out implementation actions that contribute to sustainability, with numerous small to large scale actions taken and expected outcomes.

(Source: Youth Innovation Fund Selection Criteria)

2.4 Data Analysis

At the end of the course students were to present their business model canvases to a panel of three teachers. The Youth Innovation Fund scoring matrix was the guide to the panellist, and a total of sixteen businesses had elements of environmental sustainability. The top five business will be analyzed through a narrative analysis technique has been employed, to focus on interpreting the core narratives from a study group's personal stories. Data was gathered and arranged using third-person narration to help the researcher to report as seen in the respective business model canvas(McCombes, 2023; Islamia, 2016). The business model canvases presented by students have been presented, and discussed with other authors in the respective subject matter. Some of the business ideas that were presented were actual existing business, while others were business ideas that students wanted to work on. Those are described in the paper as non-existent business ideas.

5. FINDINGS AND DISCUSSION

5.1 Plastic Paving Blocks – Mwanza

A School of Business student owned a brick making business in Mwanza. During the classes he and his team members decided to come up with a new model of the business by using smelted plastic as the glue, hence replacing the use of cement. The idea was to collect as much plastic as possible, put it in a steel container that would be placed on fire to start the smelting process. Once fully smelted, they would add sand and thoroughly mix it. The hot combination will then be put in a paving block mould for cooling. After having various plastic/sand ratio, they settled for one and started the business. They realized that the paving blocks would be cheaper, more durable and cheaper for their customers. They were considering implementing the same on building blocks after consultation with architects to see how feasible that will be and whether there might architectural implications, should they sell such building blocks. The business scored a 5 as per the YIF scoring matrix, because its vision focuses on the green economy, and has a tangible plan to carry out implementation actions that contribute to sustainability, with numerous small to large scale actions taken and expected outcomes.

According to the UN Environment Programme (2021), Tanzania generated over 315 thousand tonnes of plastic waste in 2018, and it is estimated that only 40% of the plastic waste is collected. The report further states that 96% of the plastic waste is mismanaged and can potentially leak to the oceans, rivers and lakes of Tanzania. In Tanzania, plastic waste is an enormous environmental issue, polluting the country's waterways, beaches, and coral reefs and endangers marine life and human health (Bruksle, Ieva, Chwallek, Constanze & Krastina, 2023). Unlike organic waste, plastic waste does not rot. Using an innovative way to decrease production cost, and utilizing plastic as a glue agent in creating paving blocks is not only creative, but also better for the environment. A number of initiatives have been taken to combat plastic in Tanzania. They include the plastic ban which was effected in June, 2019, the Tanzania National Environmental Policy which shows the countries commitment to reduce plastic waste and includes collaborative initiatives with international environmental organizations and local communities to encourage sustainable waste practices. In addition to the above, there have been various clean-up campaigns to include the community and create awareness (NEMC, 2012). The plastic paving block business employs another technique of cleaning the plastic; adding value to it and changing its use.

5.2 Water-Hyacinth Fertilizer – Mwanza

This was a non-existence project by a group of students from the School of Law and Justice. The water-hyacinth which is a type of water-weed has been a hindrance to fishermen in Mwanza, which is one of the main economic activities among the inhabitants of the Lake Zone. The idea was to use the weed to create manure by crushing and dehydrating the water hyacinth collected from the lake, and adding the fermented animal dung into the crushed and dehydrated water hyacinth. The mixture is then stored in a covered pit with water to maintain moisture levels of 50–80%. The next process is to ferment the mixture and periodically raise the temperature to 40–70°C. After completing the fermentation process, its packed and sold as a fertilizer. According to the group, the three main benefits of this kind of fertilizer are the improvement of soil quality, reduction of pollution and reduction of water hyacinth overgrowth. In addition of cleaning the environment, the business anticipated employing a number of unskilled labourers, for collection, fermentation and packaging. The business scored a 5 as per the YIF scoring matrix because its vision focuses on the green economy, and has a step-by-step plan to carry out implementation actions that contribute to sustainability, with numerous small to large scale actions taken and expected outcomes.

According to Harley et al., (1997), the water hyacinth in Lake Victoria started in late 1988 and rapidly spread as a result of abundance in nutrient in the Lake. It grew to the extent of stopping ships and close commercial harbours. There are a number of reports that have listed some of the effects of the water hyacinth as being reduction in fish through de-oxygenation of the water in the sheltered bays that are their nursery grounds, physical interference with fishing and transportation, impediment to urban and rural water supply and to the Owen falls hydro power station and provision of habitat for dangerous organisms like snails that cause bilharzias, and for mosquitoes and snakes. (Masifwa et al., 2001; Twongo, 1996; Mailu, 2001). Globally, there are three ways of combating the water hyacinth: biological, mechanical and physical. However, the application of chemical herbicides even though known to be faster in controlling the spread of aquatic weeds in other water bodies was greatly discouraged by environmental scientists due to the fragile nature of the lake ecosystem (Opande, Onyango, Waga, 2004). The problem has reduced, but is still

persistent in Mwanza. Coming up with a solution of adding value to a destructive weed and using it for agricultural activities; the backbone of Tanzania, is innovative and productive.

5.3 Nazi Point – Dar es Salaam

A female student from the School of Business Studies who resides in Mbagala – an area notorious for coconut already had a business of creating small scale ornaments made of local beads. Upon attending the class, she and her group members came up with the idea of Nazi Point (Nazi translating to coconut). Their slogan was “we use everything, we lose nothing.” The idea is basically utilizing everything of coconut. The coconut flesh for snacks known as *vishata*, and the coconut milk for coconut oil, often used on newborns and toddlers in Tanzania to nourish their delicate skin. The shell of the coconut is used for ornaments such as earrings, bangle, soap dispenser, cups, trays, wooden spatula. The idea is to ensure that nothing is thrown out. Locals normally throw away the coconut water and shells, but the group made use of each and every component of the coconut. The business scored a 4 as per the YIF scoring matrix, as it indicated favourable attitudes towards environmental management and has indicated a number of small to large scale measures in early stages of the plan to mitigate negative environmental impact and contribute to sustainable operations. Generally, environmental impact is considered an important part of the vision of the business.

This is not a new innovation, according to Vieira, Hortência, Santos, Vaz-Velho, Daniel (2024) in their study on Coconut Waste established that utilization of coconut products to the fullest, plays a crucial role in both subsistence and economic activities across Asia, the Pacific Islands, and South America. The coconut palm has been utilized since civilization and offers several advantages to humanity and is easily gathered in locations where coconut meat is typically used to prepare cuisine. There are various uses of coconut products, where 35% of coconuts are used for copra, 2% are utilized to make value-added products, 11% are used for tender reasons, and 2% are used as seeds. Dust makes up the remaining 40% of the coconut fruit, which is made up of 40% coconut husks with 30% fibre (Extension, Kiu Publication, 2023). Replicating the business in Tanzania and making full use of the coconut, not only creates employment to the students, but also to the business ecosystem involving the coconut farmers, carpentry division and culinary division (Rahdari, A., Sepasi, S., & Moradi, M. 2016).

5.4 Tailoring – Mwanza

This was another existing business in Mwanza. The female students, studying Bachelor of Law co-owns a tailoring business with her mother. They had discussed about growing horizontally, by opening another office, some 15 kilometres from the initial office, a place with a larger population and higher purchasing power. After attending the innovation and entrepreneurship modules, the student and her group members opted for a vertical growth. What made this business stand out was the aspect of utilization of the raw materials. While tailoring there are pieces of clothes that end up unused. The course enabled them to come up with a model, where nothing gets thrown out. The larger pieces of remaining cloth materials would be used to make quilted table mats, pillow cases, beddings, doormats and décor. The finer pieces of cloth materials would be used to stuff pillows and dolls. That way, they would add value on the waste, and simultaneously increase their income. The business scored a 3 as per the YIF scoring matrix, as it indicates favourable attitude

towards environmental management and has indicated small to medium scale measures in early stages of the plan to mitigate negative environmental impact and contribute to sustainable operations. Environmental impact is taken into consideration for the vision of the business.

One of the main responsibilities of all urban authorities in Tanzania is the collection, transportation, and disposal of solid waste (Driedger, Dürr, Mitchell and Van Cappellen, 2015). It's a legal requirement in line with the Environmental Management Act of 2004 (NEMC 2012) and Section 55(g) of the Local Government Act of 1982. However, waste management is a major problem in most cities because of the fast growth of cities, the financial constraints faced by many urban authorities, and the unwillingness of urban residents to pay for the services. The efficiency of solid waste collection, transportation, and disposal systems is gradually declining even though the amount of waste produced by cities and municipalities is rising. Furthermore, in developing countries like Tanzania, solid waste management is still difficult, frequently because of inadequate infrastructure and technology as well as a lack of funding, in contrast to the majority of developed countries where plastic waste is frequently separated from other wastes before being disposed of (González-Torre and Adenso-Díaz 2005). Waste management in tailoring business not only addresses the issue of waste management, but also adds value and increases the income from the waste. According to the Economic and Social Research Foundation (2016) the Tanzania Chamber of Commerce, Industry and Trade reports that majority of the SMEs in Tanzania are in clothing and tailoring, furniture industry and food processing industries with women being major players in these sectors. If replicated in other businesses, this kind of business can significantly reduce the waste in urban cities.

5.5 Newspaper Envelopes – Dar es salaam

This was a business model canvas from students in the School of Business Studies. The students capitalized on the ban of plastic bags enforced by the United Republic of Tanzania on June 1, 2019. Tanzanians were still finding their footing on adapting to this, and students felt that by using used newspapers that are inexpensive, they could make envelopes for carrying small items from the market and shops. The idea was to have small, medium and large envelopes that they would sell to small shops and vegetable stands at an affordable price. These envelopes would also be instrumental to business women selling breakfast items such as the local *chapatti*, *vitumbua* and *sambusa*, as they could no longer package their goods in plastic bags. The idea would amplify the government's effort of reducing plastic and simultaneously reduce paper waste from used newspapers that are produced in thousands on a daily basis. Even though the business could not take off, and the target customers did not need folded newspapers, but just used used-newspapers as they are, and local breakfast women could not use newspapers of any sort as the oil activated the ink on the newspapers, and later leaked to their product, the business scored a 2 as per the YIF scoring matrix. This was due to the fact that the business showed favourable attitude towards environmental management and has indicated potential small scale measures to reduce the negative impact of the business. However, environmental impact is not the main vision or value proposition of the business.

As the population grows and online shopping gains popularity, more paper products are produced. According to a study on paper.com, there were more than 14.3 billion packaging boxes and more

than 50 billion express packages sent to China in 2018. Data from the "Paper Industry Association White Paper" indicates that, on average, 1 million tons of paper are consumed, which represents around 2.3% of the output of corrugated and boxboard paper. In combating this, recycling, reusing, and recovering are replacing garbage disposal as the primary methods of waste management (Senarathna, Sulaksha, Deelaka & Jayathma, 2023). A 100% reduction in wood use, a 33% reduction in wastewater, a 27% reduction in energy consumption, a 28% reduction in air particle emissions, and a 54% reduction in solid waste are achieved by substituting one ton of recycled paper for one ton of virgin fibre (Senarathna, Sulaksha, Deelaka & Jayathma, 2023). Because of this, recycling waste paper is growing in popularity as a resource-efficient and ecologically conscious substitute for the manufacturing of pulp and paper. Newspaper, despite the digital revolution in the media industry is still popular in Tanzania. Upon use, they become obsolete and contribute to paper waste. While the newspaper envelop business does not necessarily remove all the used newspapers from the stand, it contribute in reducing, though in a small scale, paper waste by adding value, hence reusing the paper.

6. CONCLUSION

While addressing environmental sustainability, both MGMT 225 and MGMT 311 courses aimed to facilitate students to come up with businesses that envision and focus on the green economy, and have a tangible plan to carry out implementation actions that contribute to sustainability, with numerous small to large scale actions taken and expected outcomes. From the top five businesses, it is obvious that a number of issues have been addressed. One, with regards to sustainable development goal 8, all five businesses created employment to the students and others within the value chain of their respective businesses. Two, a number of environmental solutions were established from these businesses: innovative cleanup of plastic waste in the plastic paving block business, restoration of health to the water ecosystem in the water-hyacinth fertilizer business, minimal waste creation in the Nazi Point and Tailoring business and re-use of paper in the newspaper envelop business. Innovation and entrepreneurship are of outmost importance to university students for employment and environmental sustainability. This paper recommends that other higher learning institution adapt the methods of teaching and including environmental aspects in teaching innovation and entrepreneurship courses to its students.

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