

# Green Entrepreneurship Integration in Maoming City's Universities Curriculum

Jian Sun<sup>1\*</sup>, Yaoyang Zhou<sup>2</sup>, Zhuyu Liang<sup>2</sup>, Lanlan Li<sup>2</sup>

<sup>1</sup>School of Innovation & Entrepreneurship, Guangdong University of Petrochemical Technology (GDUPT), Maoming, Guangdong 525000, China

<sup>2</sup>Guangdong University of Petrochemical Technology, Maoming, Guangdong 525000, China

\*Corresponding author: Jian Sun, xzsj110@126.com

**Copyright:** © 2024 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

**Abstract:** Nowadays, petrochemical cities are all facing environmental problems, which is also a problem that Maoming, Guangdong Province, China, has been trying to solve. Maoming is a key petrochemical city in Guangdong Province, and solving environmental problems is a necessary measure to develop an economic model in the future. Maoming has unique conditions there are three colleges in Maoming City, such as Guangdong University of Petrochemical Technology, Guangdong Maoming Preschool Normal College, and Guangdong Maoming Agriculture & Forestry Technical College. The current research strategy involves combining green development with university students' research topics and integrating development into these research topics. Through the output of some problems, corresponding feedback can be obtained and solutions can be made.

**Keywords:** Petrochemical; Environmental problems; Sustainable; Economic

**Online publication:** May 15, 2024

## 1. Introduction

Green entrepreneurship refers to the development, promotion, and use of environmentally friendly products and services. Universities are increasingly recognizing the role of universities in fostering green entrepreneurship, which involves creating a supportive ecosystem for students, faculty, and local businesses to participate in sustainable and environmentally responsible businesses. Much previous research has explored the role of higher education institutions in promoting sustainable development and innovation. Universities can play a key role in promoting green entrepreneurship and its applications through research and education.

Due to the large number of petrochemical enterprises, petrochemical cities have always faced environmental challenges. However, there is a growing global awareness that these cities need to transition to a more sustainable economic model. The growing concern for environmental sustainability and the need to move towards a greener and more sustainable economy has led to greater attention being paid to green entrepreneurship. Petrochemical cities, often associated with heavy industry and environmental challenges, are now exploring new avenues for sustainable economic development, and local universities are playing a key role

in this transformation.

Petrochemical cities have historically faced environmental challenges due to the heavy presence of industries. However, there is a growing global awareness of the need to transition these cities towards more sustainable economic models.

Maoming is an important petrochemical city in Guangdong province, and universities in the region have great potential to carry out green entrepreneurship projects. The study aims to understand the development of green entrepreneurship curricula in colleges and universities in Maoming City and their impact on the local and regional economy. There are three colleges in Maoming City, such as Guangdong University of Petrochemical Technology, Guangdong Maoming Preschool Normal College, and Guangdong Maoming Agriculture & Forestry Technical College. Universities in the region have great potential for carrying out green entrepreneurship projects.

Overall, the potential for green entrepreneurship is promising in Maoming. Universities curriculum of green entrepreneurship in the region can leverage their skills, talent, and resources to provide comprehensive solutions to environmental problems and create new opportunities for sustainable development.

## 2. Statement of the problem

The purpose of this study is to investigate the status of green entrepreneurship curricula in universities in Maoming City.

Specifically, it will seek to answer the following problems:

- (1) What is the profile of the participants in terms of the following: (a) Gender; (b) Age; (c) Highest educational qualification; (d) Major; (e) Department?
- (2) What is the assessment of participants in the extent of integration of Green Entrepreneurship in their curriculum in terms of the following areas: (a) Curriculum integration zones for green entrepreneurship; (b) Faculty expertise; (c) Experiential learning; (d) Mentorship programs?
- (3) Is there a significant difference in the assessment of the participants in the extent of integration of green entrepreneurship when they are grouped according to profile variables?
- (4) What is the level of the participant's competence in green entrepreneurship in terms of the following: (a) Skills; (b) Interest and attitude?
- (5) Is there a significant difference in the level of the participant's competence in green entrepreneurship when they are grouped according to profile variables?
- (6) What are the problems and challenges encountered by the participants in the integration of green entrepreneurship into the curriculum?
- (7) What plan of action can be proposed to address the problems and challenges in the integration of green entrepreneurship?
- (8) What strategies can be used to encourage curriculums to engage with local community practices to foster a spirit of sustainability?
- (9) How can local Maoming enterprises cooperate with Maoming University to provide curriculums with practical experience in green entrepreneurship?

## 4. Questionnaire

Sample refers to the selected members from a particular population. It is a subgroup of the population, while sampling is the procedure of choosing an adequate amount of the exact individuals, objects, or events that

represent the whole population <sup>[1]</sup>.

**Table 1** shows the questionnaire distributed to the entire school and community.

**Table 1.** Questionnaire

<b>Section One: Internal Factor</b>							
Please circle the number corresponding to your answer. Circling a "1" means that you strongly disagree with the statement, and circling a "7" means that you strongly agree. You may circle any of the numbers in between that show how strongly you agree with the statement. There are no right or wrong answers – all I am interested in is a number that best shows your perceptions about the mentioned issues.							
<b>Absorptive Capacity</b>							
The college has routines to ensure the observation of the environmental demands and legislations.	1	2	3	4	5	6	7
We conduct preliminary environmental assessments in college.	1	2	3	4	5	6	7
The employees in the college participate in environmental training programs.	1	2	3	4	5	6	7
The college set up measurable environmental goals.	1	2	3	4	5	6	7
The college has a plan of action on how to achieve environmental goals.	1	2	3	4	5	6	7
The college has implemented the Life Cycle Analysis (LCA) as a means to identify environmental impacts from our products/services.	1	2	3	4	5	6	7
The college performs environmental audits.	1	2	3	4	5	6	7
The college has implemented environmental declarations as a means to identify the environmental impact of our products/services.	1	2	3	4	5	6	7
As a manager, I have the knowledge to influence strategic decisions so that they meet environmental interests.	1	2	3	4	5	6	7
As a manager, I have the knowledge to influence operations and practices so they develop in line with environmental interests.	1	2	3	4	5	6	7
<b>Dynamic Capabilities</b>							
Resource integration capability	1	2	3	4	5	6	7
Resource reconfiguration capability	1	2	3	4	5	6	7
Learning capability	1	2	3	4	5	6	7
Ability to respond to the rapidly changing environment	1	2	3	4	5	6	7
<b>Section Two: External Factors</b>							
Please circle the number corresponding to your answer. Circling a "1" means that you strongly disagree with the statement, and circling a "7" means that you strongly agree. You may circle any of the numbers in between that show how strongly you agree with the statement. There are no right or wrong answers – all I am interested in is a number that best shows your perceptions about the mentioned issues.							
<b>Economic Sustainability</b>							
Ease of material handling	1	2	3	4	5	6	7
Energy consumption	1	2	3	4	5	6	7
Cost reduction	1	2	3	4	5	6	7
<b>Social Sustainability</b>							
Social recognition	1	2	3	4	5	6	7
Human capital development	1	2	3	4	5	6	7
Job creation	1	2	3	4	5	6	7
Health and safety	1	2	3	4	5	6	7

**Table 1 (Continued)**

<b>Environmental Regulation</b>							
Environmental policies	1	2	3	4	5	6	7
Pollution control costs	1	2	3	4	5	6	7
Pollution emissions	1	2	3	4	5	6	7
Direct grants and indirect grants	1	2	3	4	5	6	7
Provision of subsidy for green products. e.g., the government gives subsidies for green products	1	2	3	4	5	6	7
Sponsor of technology e.g., the government provides interest-free or discounted loans	1	2	3	4	5	6	7
<b>R&amp;D Grant</b>							
Tax preference e.g., "the government provides environmental regulation tax preference"	1	2	3	4	5	6	7
Talent awards	1	2	3	4	5	6	7
<b>Green Subsidies</b>							
Amount of subsidies related to environmental protection (billion)	1	2	3	4	5	6	7
<b>Section Three: Environmental Performance and Organizational Performance</b>							
Please circle the number corresponding to your answer. Circling a "1" means that you strongly disagree with the statement and circling a "7" means that you strongly agree. You may circle any of the numbers in between that show how strongly you agree with the statement. There are no right or wrong answers – all I am interested in is a number that best shows your perceptions about the mentioned issues.							
<b>Environmental Performance</b>							
Reduced pollution (e.g. air emissions)	1	2	3	4	5	6	7
Reduced energy and materials consumption (e.g. gasoline/fuel)	1	2	3	4	5	6	7
Reduced consumption of hazardous/harmful/toxic materials	1	2	3	4	5	6	7
Reduced frequency of environmental accidents	1	2	3	4	5	6	7
Improvement of environmental compliance	1	2	3	4	5	6	7
Use of environmentally friendly material	1	2	3	4	5	6	7
<b>Organizational Performance</b>							
Market position improvement	1	2	3	4	5	6	7
Enhancing the reputation	1	2	3	4	5	6	7

The following are the summarized findings:

Part One: Regarding internal factors, it was concluded that the majority of citizens in Maoming possess a certain level of environmental awareness and have personal plans for environmental conservation. They also exhibit considerable personal capabilities and aspirations for implementing environmental initiatives. However, within universities, the overall environmental atmosphere is not particularly strong. The proportion of courses and projects related to environmental conservation is minimal. In line with the objective of our thesis, addressing this situation entails scheduling as many environmental interest courses as possible within Maoming's universities, without increasing the burden, to foster environmental awareness among more young people and contribute to Maoming's environmental conservation efforts <sup>[2]</sup>.

Part Two: Feedback on external factors indicates that in terms of economic sustainability, the convenience of material handling, energy consumption, and cost reduction are deemed crucial. Higher scores suggest that participants believe these factors are essential for economic sustainability. Regarding social sustainability, high scores were observed for social acceptance, human capital development, job creation, and health and safety.

This indicates that participants consider social factors crucial for sustainability, including social acceptance and employee health and safety. In terms of environmental regulations, participants generally perceive the importance of environmental policies highly. However, there are differing views on pollution control costs and emissions. Some may believe that implementing environmental policies entails high costs, while others may prioritize reducing pollution emissions. Particularly noteworthy is the perception of green subsidies, where differing views exist regarding government subsidies for green products versus support for technological assistance and sponsorship <sup>[3]</sup>.

Part Three: Scores indicating a high emphasis on reducing pollution suggest that participants may have a high level of concern for pollution reduction (such as air emissions) . High scores for reducing energy and materials consumption reflect participants’ awareness and emphasis on sustainable resource utilization and conservation. The high score for enhancing environmental compliance may imply that participants perceive compliance with environmental regulations as crucial for organizational success. The emphasis on using environmentally friendly materials reflects a recognition of sustainable and environmentally friendly products <sup>[4]</sup>.

#### 4. General information

General information about the participants was obtained using the following general information questionnaire (Table 2).

**Table 2.** General information

---

Please answer the following questions by filling in the blanks or ticking (☑)  
 For the purpose of classification, please give us brief information about yourself

---

(1) Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female		
(2) Education level	<input type="checkbox"/> Junior	<input type="checkbox"/> Bachelor’s	<input type="checkbox"/> Master’s	<input type="checkbox"/> Ph.D.
(3) Organization position	<input type="checkbox"/> Officer	<input type="checkbox"/> Teacher	<input type="checkbox"/> Student	
(4) Number of years studying/working for the college	<input type="checkbox"/> 1–3	<input type="checkbox"/> 4–6	<input type="checkbox"/> 7 and more	
(5) How many people does the college employ?	<input type="checkbox"/> 200–499	<input type="checkbox"/> 499–800	<input type="checkbox"/> 801–999	<input type="checkbox"/> ≥ 1,000
(6) What year was the college established?				
(7) Suggestions and feedbacks				

---

#### 5. Future research

The team will integrate the results of the questionnaire survey with the local context, focusing on the social research of “integrating green entrepreneurship into the curriculum of Maoming City universities.” With numerous universities in Maoming, there is an abundance of fresh talent, who are also the main respondents of the questionnaire. Their ideas will undoubtedly be combined with the current situation and their own university life, integrating green entrepreneurship into their university courses. Being in Maoming, they will also realize that this city, with its numerous petrochemical enterprises, needs the emergence of green entrepreneurship to achieve sustainable development. Establishing green entrepreneurship education in university courses will undoubtedly bring unimaginable benefits to Maoming. The team will collaborate with the local government to promote the integration of green entrepreneurship into university courses, providing new ideas for the sustainable development of Maoming’s petrochemical industry.

## Funding

- (1) Guangdong Provincial Education Science Planning Project (Higher Education Special) (Project No. 2023GXJK397)
- (2) Guangdong University of Petrochemical Technology Education Reform Project (No. JY202311)

## Authors contribution

Conceptualization: Jian Sun

Investigation: Yaoyang Zhou, Zhuyu Liang, Lanlan Li

Formal analysis: Zhuyu Liang, Lanlan Li

Writing – original draft: Yaoyang Zhou

Writing – review & editing: Jian Sun, Yaoyang Zhou, Zhuyu Liang, Lanlan Li

## Disclosure statement

All authors disclosed no relevant relationships.

## References

- [1] Sekaraun U, Bougie R, 2016, *Research Methods for Business: A Skill-Building Approach* (7th ed). Wiley & Sons, West Sussex.
- [2] Jones G, 2017, *Profits and Sustainability: A History of Green Entrepreneurship*. Oxford University Press, Oxford.
- [3] Schaper M, 2010, *Making Ecopreneurs: Developing Sustainable Entrepreneurship* (2nd ed). Routledge, London.
- [4] Sun J, Chen H, Li L, 2019, Exploration of Enhancing Regional Green Entrepreneurship Competitiveness through the Integration of “Government-Industry-University-Research” in Industrial Colleges of Universities. *Journal of Hunan Mass Media Vocational Technical College*, 2019(2): 72–75.

### Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.