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# University Incubators as Catalysts for Sustainable Tourism Entrepreneurship and a Green Innovation Framework

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## Abstract

*Entrepreneurship within travel is seen as a strong contributor to the economy and economic growth, jobs, and sustainable development. Many students struggle to develop appropriate knowledge, skills, and resources needed to start-up a sustainable tourism business. This study looks at how university incubators help students to improve their entrepreneurial skill set for the purpose of establishing green (sustainable) travel ventures within state universities. The research will assess how the university incubators are helping students to improve their travel-related entrepreneurial knowledge, skills and business capabilities; provide hands-on training to help students launch sustainable tourism business ventures by generating (and/or having access to) necessary resources; and provide opportunities for students to create self-employment and/or job opportunities through entrepreneurship in tourism. This research used a quantitative research method with researchers collecting 292 university students using a structured questionnaire to collect data. The questionnaire contained demographic information and the data analysis used weighted average methods, t tests, ANOVA to determine the relationship among university support, entrepreneurial competency, green innovation, and preparedness for sustainable tourism businesses. The results are expected to indicate that the university-based incubators and practical training programs greatly increase students' knowledge about entrepreneurship, practical skills, and intentions to start a sustainable tourism business. Additionally, the study emphasizes the need for the higher education system to incorporate sustainability and green innovation within the curriculum of entrepreneurship to help prepare students to be successful in careers that include working in tou*

**Keywords:** University Incubators, Sustainable Tourism, Green Innovation, Tourism Entrepreneurship, Entrepreneurial Skills

## Introduction

With the popularity of tourism on the rise globally, tourism sectors have an increasingly prominent role in the economic development in many areas around the globe. The number of jobs available in the global tourism sector is extensive, while also allowing for cultural exchange between countries (UNWTO 2022). More and more people

are requesting ‘sustainable’ or ‘eco-friendly’ travel choices, and therefore, tourism developers are creating ‘sustainable’ tourism products in order to meet a balance among economic growth, ecological sustainability and social obligation so future generations can benefit (Hjalager 2010). State universities in particular have emerged as key contributors to support the development of students’ entrepreneurial skill set and development of sustainable tourism products (Audretsch, 2014). State universities continue to develop infrastructure and resources to provide students with access to entrepreneur support, structured training and learning ecosystems to prepare them as entrepreneurs in sustainable tourism. Students can develop the knowledge, skills and competencies necessary to create their own sustainable tourism business as a result of experiential learning, mentoring, incubation support and project-based experiences that lead to the creation of innovative ideas, the application of green practices and creation of job opportunities (Etzkowitz & Leydesdorff, 2000; Grimaldi & Grandi, 2005). Research demonstrates there are very few studies on the contribution of most state universities in India, particularly Tamil Nadu, to implementing sustainable entrepreneurial practices (green innovation), nor how they integrate sustainable development principles into their tourism entrepreneurship training programs. To date, much of the empirical research on sustainable entrepreneurship in education has been focused on developed countries or private educational institutions. There still exists a considerable gap in the research related to how public / state universities contribute to sustainable tourism entrepreneurship development through their education/training platforms related to tourism entrepreneurship (Lozano et al, 2013; Sigala et al, 2018). Tourism is one of the largest sectors of the world’s economy and it creates numerous job opportunities at the local level, with income being generated and cultures being exchanged regionally (Santos et al., 2021; Andrade-Valbuena et al., 2022). Due to the rapid growth in this sector, numerous negative environmental impacts as well as negative social issues and challenges exist, requiring a new, sustainable way of conducting business (Santos et al., 2021) Sustainable tourism entrepreneurial activity integrates ecological sustainability, social equity, and economic sustainability to allow entrepreneurs to create a balance between their growth and the welfare of their environment and community (Tiwari, 2025). Although there is continuing research interest in the area of sustainable entrepreneurship in education, the literature remains quite fragmented and limited when considering empirical research regarding how institutions of higher education are preparing students for sustainable tourism entrepreneurship (Tiwari, 2025). An increase in the emphasis of universities to offer an entrepreneurship and innovation program to enhance student capabilities and promote new business development has been apparent in higher educational institutions, especially at state universities (Gulzar & Rashid, 2025). Numerous resources offered by university incubators including mentorship, financing, can help develop students’ entrepreneurial competence, attitude and intention (Elshaer & Abdelmalek, 2022; Sustainability, 2022). Furthermore, studies show that support from incubators is critical in developing the entrepreneurial intentions of graduating tourism students since they will ultimately provide improved personal attitude and perceived competency (Elshaer & Abdelmalek, 2022). Nevertheless, few studies have looked specifically at the link between sustainability, green innovation and incubator support in tourism entrepreneurship educational programs; particularly within the Indian state university context. The intent of the current study is to address the above-mentioned gap in order to understand how university incubator support and training programs can influence students’ entrepreneurial competencies, use of green innovation, and their level of readiness for sustainable tourism ventures. In addition, through utilizing students attending Indian state universities, this research is expected to provide insight into how education ecosystems contribute to sustainable

## Literature Review

Mustafa et al (2023) conducted an empirical investigation into the impact of the environment in universities on Tourism and Hospitality students' entrepreneurial motivation, supported by a foundation of both social cognitive theory for career choice as well as institutional theory. The authors determine that student perceptions about their university's entrepreneurial environment as measured by the degree of support provided to students for entrepreneurial activities, participant self-efficacy, and positive expectations of outcome all significantly influence the students' desire to start a new business. The research builds upon a sample population of 190 final year students studying tourism and hospitality, analysed using structural equation modelling via partial least squares, and identifies both the impact of the university's institutional context on the student's development of entrepreneurship in tourism education, as well as how the development of entrepreneurial intentions by the studKPSU

Ntshangase and Ezeudji (2022) investigated the relationship between entrepreneurship education and the entrepreneurial intentions of Tourism students at a university in South Africa. Data were collected by using structured questionnaires completed by 154 Tourism students. The findings confirmed that tourism students' views as to whether starting a tourism related business after graduation was desirability and feasibility is positively influenced by the level of entrepreneurship education they received during their studies. Additionally, individual profile factors have an impact on students' reaction to their experiences of entrepreneurship education and consequently, it is recommended that there be a focus on developing tailored entrepreneurship education and early involvement with assistive entrepreneurial activities. The findings support potential curriculum reform recommendations including establishing dedicated entrepreneurship tracks and mentoring opportunities, which would help provide graduates with increased future employment opportunities throughnnoqqàràtà

Torres Valdés and coauthors' (2019) conceptual framework on the experiential learning ecosystem will help universities develop entrepreneurial ecosystems for promoting sustainability within the framework of the current tourism sector. The study consisted of a mixed methods participatory action research (PAR) project, implemented in a tourism course at the University of Alicante that utilized a relational university model. Researchers discovered that the relational university model encourages higher education students to develop their own entrepreneurialism and become more responsible members of society through active participation in the development of sustainable tourism businesses. The proposal also encourages collaboration between higher education institutions and society, as well as providing value to assist with innovative and sustainable transitional initiatives. It will also assist in promoting sustainable regional development.

Nugraheni, Budiman, and Sukmayadi's (2019) literature review explores the development of relational university construction and its ability to create strong connections between learning and entrepreneurship ecosystems in order to promote sustainable tourism. The review identifies how experiential learning, collaborative learning among stakeholders, and active student engagement can help cultivate entrepreneurial competencies (i.e., abilities such as creativity, effectual thinking, etc.) and enhance student social responsibility. Finally, the review demonstrates how even small educational initiatives have provided students with the empowerment to develop as engaged stakeholders in sustainable tourism innovation, build stronger university/society connections, and contribute to regional developmenrrrsó

Muñoz-Fernández, et al.,(2016) proposed this study to analyse two key aspects: the influence of gender on entrepreneurial education, and the influence of education on tourism students' intention to become entrepreneurs. To accomplish this, the authors focused on the curriculum, the student experience and the educational context of students enrolled in tourism programs, and their

relationship to students' intention to become entrepreneurs. The results of the study indicate that there are differences between male and female students in terms of engagement, self-efficacy, and the desire to participate in entrepreneurial activities; therefore, gender may affect entrepreneurship outcomes in the tourism sector, and as such, the authors of this study suggest offering varying types of educational support for both male and female students to help develop the necessary entrepreneurial skills that women and men will require as they enter their future careers in the tourism sector.

Ivanov, S., & Dimitrova, M. (2010) the objective of this research paper is to evaluate the character of entrepreneurship education in the tourism and hospitality undergraduate syllabus and colleges and how this course is being taught as an independent discipline. The authors explain how the structure of entrepreneurship courses is organized and what level of involvement students have participated in within a practical business plan environment as well as the many barriers that are faced while establishing entrepreneurship as a primary area of study within the curriculum. The authors highlight the need to connect the theory-based knowledge of entrepreneurship to the actual application of entrepreneurship through real-world entrepreneurial concepts to support the establishment of a tourism-based business, thus improving students' overall potential for entrepreneurship.

### **Research Gap**

Previous study has investigate the links between education of entrepreneurship, higher education incubators, and sustainable tourism. However, much of the investigation has not come together as a whole system to reveal how these 3 components work together as part of an overall relationship-oriented university and learning ecosystem framework. Most previous studies have taken place in developed nations and provided limited insights into state universities or newer tourism destinations. Also, little empirical evidence exists that describes how the learning and entrepreneurship ecosystems that are supported by universities contribute to the development of students' ability to create sustainable tourism businesses and green innovation. Consequently, there is a need for focused research examining the combined effect of relationship-based universities, learning ecosystems, and entrepreneurship ecosystems on the growth of sustainable tourism entrepreneurs

### **Problem Statement**

The pursuit of sustainable tourism and green entrepreneurship has increased in importance; however, many students do not have sufficient exposure to practical experience, support from institutions and opportunities for ecosystem-based learning to help them to create and sustain their own business ventures in the area of sustainable tourism. For the most part, state universities confront barriers to integrating relational partnerships, experiential learning and incubation support within their tourism entrepreneurship program. Due to this, students' entrepreneurial skills and their ability to develop sustainable tourism enterprises is currently underdeveloped; the purpose of this research was to comprehend the potential collaborative impact of relational universities, learning ecosystems and entrepreneurship ecosystems as they relate to assisting students in developing sustainable tourism entreprEEEEFG

### **Objectives**

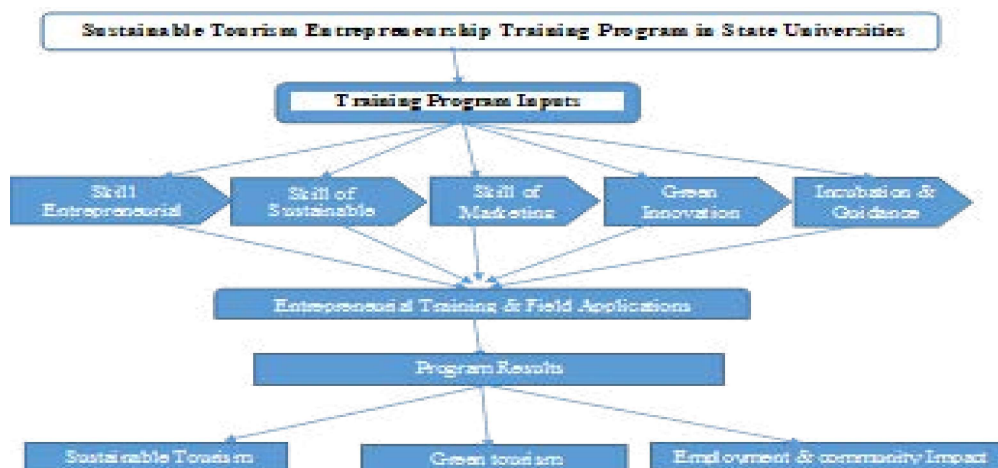
- To efficacy students' knowledge of entrepreneurial, innovation skills, and business competencies in the tourism sector.

- The purpose of the program is to give the opportunity for students to gain hands-on practical training sustainable tourism businesses by effectively using resources and opportunities provided by this program.
- To develop the capacity of students to generate self-employment and employment opportunities in tourism for themselves and others through anticipated career development initiatives.

### Theoretical Framework

The study used three theories; Human Capital Theory, Experiential Learning Theory, and Theory of Planned Behavioral Theory. These theories show how accommodation, training, and support for students in institutions make them successful entrepreneurs in the tourism industry. According to Becker (1964), “Human Capital Theory claims people will have greater knowledge, skills, and productivity as a result of their educational and experience/learning”. In the profession of entrepreneurship within the scope of tourism, this means that students who have been exposed to quality business/entrepreneurial training will; develop necessary competencies for starting and running a tourism-based venture. Experiential Learning Theory teaches us that it is best for students to learn in a real world environment which can include working on actual projects (through practical internships), short-term training for jobs, and working in an incubator type environment. According to Kolb, these types of experience can be extremely beneficial to students developing the required skills and knowledge needed to establish a sustainable tourism business. The Theory of Planned Behaviour states that a person’s attitude, belief and social support levels influence their behavioural intention to start a business. Therefore, students that have received entrepreneurial training from an educational institution and also have the support of an educational institution will have increased confidence to start their own business in the tourism industry. Collectively, these three theories apoio in understanding how entrepreneurship training programs, combined with incubator support provide a significant improvement in the students’ entrepreneurial knowledge, skill set, plausible intentions±

### Conceptual Framework



Sustainable tourism entrepreneurship training transforms inputs into results through a conceptual framework developed by state universities providing education. Experiential learning and hands-on experience teach entrepreneurial skills, skills for creating sustainable tourism, traits needed in marketing a green product, innovation, and supporting an incubation process in developing these

products. By providing these opportunities to re-apply knowledge in the tourism industry, students gain knowledge and develop competence in creating sustainable forms of tourism, generate products and services in the creation of new jobs, and build a sense of community among tourists visiting their area. The conceptual framework shows that through a structured training program the development of new and innovative forms of tourism entrepreneurship can occur.

## Methodology

### Research design

The study adopts a descriptive and analytical research design to examine the role of university incubators in supporting tourism entrepreneurship through sustainability and green innovation. A quantitative approach was used to collect and analyze primary data from university students.

### Sample

A sample of 292 university students was selected using a convenience sampling technique. The respondents had exposure to entrepreneurship education, tourism-related courses, or incubation activities.

### Data Collection Method

Primary data were collected using a structured questionnaire administered directly to students. The questionnaire included:

- Demographic profile,
- Items related to university incubator support,
- Tourism entrepreneurial skill development, and
- Sustainability and green innovation practices.

### Tools for Data Analysis

The collected data were analysed using:

- Percentage analysis for demographic variables,
- Mean score and Weighted Average Method for ranking factors,
- t-test and ANOVA to examine group differences.

### Hypothesis

- $H_1$ : Tourism courses that college/university students are taking have positive impact to their entrepreneurs' knowledge, ability & competencies relative to businesses.
- $H_2$ : Practical training received from college/university tourism programs significantly enhance students' capacity for launching successful/sustainable tourism businesses.
- $H_3$ : Tourism education plays an important role in preparing college/university students to create themselves and/or others employment opportunities in the tourism industry.

## Data Analysis & Results

**Table 1 Demographic Profile of Respondents**

Variable	Category	Frequency	Percentage (%)
Age	18-20	85	29
	21-23	115	39
	24-26	61	21
	Above 27	31	11

Gender	Male	161	55
	Female	131	45
	Other	-	-
Education Level	UG	180	62
	PG	94	32
	Diploma	18	6
Department	Tourism	88	30
	Management	82	28
	Commerce	78	27
	Other	44	15
Entrepreneurship coaching	Yes	217	74
	No	75	26
Entrepreneurial incubation	Yes	156	53
	No	136	47
Intention to Start-up Tourism	Yes	218	75
	No	74	25

**Source:** Primary data

Based on our demographic data, the largest age group represented is the 21-23 year old representation of 39% of the sample. The next highest age group represented is the 18-20 year old age group at 29%. The next set of demographics are gender-based, therefore 55% of the sample of participants are male and 45% are female. In terms of academic status, the largest group of participants were found in the undergraduate program at 62% followed by post-graduate at 32%, and 6% are in diploma programs. In terms of academic disciplines, the largest number of participants were found in the field of tourism (30%), followed by management (28%), and 27% constitute the commerce field; this indicates that the academic representation of the sample was quite diverse. 74% of students in the sample stated that they have received entrepreneurship training and at least 50% indicated that they have participated in incubation programs geared towards entrepreneurship support. 75% of students surveyed indicated that they plan to start a business within the tourism sector, thus indicating that there is a high demand for entrepreneurship amongst university students.

Weighted Average for Objective 1: Efficacy students' knowledge of entrepreneurial, innovation skills, and business competencies in the tourism sector.

**Table 2 Weighted Average for Entrepreneurial Skill, Innovation Skills, and Business Competencies in the Tourism Sector - N=292**

S.No	Variables	Weight					Total Weighted Score	Mean Score	Rank
		SA 5	A 4	N 3	DA 2	SDA 1			
1.	Understanding tourism Entrepreneurship	110	96	48	26	12	1142	3.91	II
2.	Business planning skills	123	90	42	26	11	1109	3.80	V
3.	Decision-making skills	127	89	47	23	6	1130	3.87	III
4.	Financial Management	117	99	49	20	7	1154	3.95	I
5.	Marketing skills	124	112	39	10	7	1095	3.75	VIII
6.	Opportunity identification	128	109	38	8	9	1087	3.72	IX

7.	Innovation confidence	120	86	38	30	18	1106	3.79	VI
8.	Problems-solving skills	129	89	28	29	17	1081	3.70	X
9.	Leadership and teamwork	113	102	31	31	15	1111	3.81	IV
10.	Ethical sustainable awareness	126	98	31	27	10	1105	3.78	VII

**Source:** Primary data

Total Weighted Average Score

$$\frac{1142+1109+1130+1154+1095+1087+1106+1081+1111+1105}{10}$$

$$=1112$$

$$\text{Overall Mean Score} = \frac{1112}{292} = 3.81$$

Various types of business competencies and skills were assessed to determine how well students have developed their tourism-based entrepreneurial, innovative and business abilities. The overall average score given by the participants for the tourism sector's entrepreneurial, innovative and business skills was 3.81 on a five-point scale. The highest average scored competency was financial management (3.95) followed closely by the understanding of tourism entrepreneurship (3.91) and the ability to make effective decisions (3.87), suggesting that participants appeared to demonstrate a high level of both financial, conceptual and analytical abilities. Among the other surveyed competencies participants also scored favourably on leadership and teamwork, business planning and innovation confidence. Conversely, the average scores for both problem-solving, identifying opportunities and marketing competencies were lower than the other weighted competencies indicating that students need to further develop these competencies. As a result, the overall conclusion of the study indicates that university programs currently provide students with all the required competencies and skills necessary to begin pursuing entrepreneurship in tourism; however, there are available opportunities to enhance students' competencies related to their practical and opportunity-driven skills.

T-test for Objective 2: Practical training sustainable tourism entrepreneurship by effectively using resources and opportunities provided by this program.

**Table 3 Difference in Practical Training for Launching Sustainable Tourism Venture based on Internship Experience (N= 292)**

Internship Experience	Mean	Std. Deviation	t-value	p-value
Yes	3.93	0.53		
No	3.66	0.60	2.63	0.009
Total Sample size = 292 Significant at p< 0.05				

**Source:** Primary data

Using the t-test statistic determined through independent sample testing method to analyse and distinguish any differences in students' practical training related to launching a sustainable tourism operation due to an internship experience was conducted to collect a total sample of 292 respondents. The results indicate that there are statistically significant differences between the students who completed internships and those who did not complete internships or related opportunities ( $t = 2.63, p < 0.05$ ). Respondents who completed an internship showed higher levels of entrepreneurship related knowledge, business plan writing ability, innovation self-efficacy, and su

ANOVA for Objective 3: Create self-employment and employment opportunities in tourism across level of study

**Table 4 ANOVA**

Source of variation	Sum of Square	Df	Mean Square	F-Value	p-value
Between Groups	2.589	2	1.295	4.09	0.017
Within Groups	91.470	289	0.317	-	-
Total	94.059	291	-	-	-
Significant at $p < 0.05$					

**Source:** Primary data

The results of a one-way analysis of variance indicated a significant difference in the abilities of students at different levels of education to create self-employment and employment opportunities in tourism ( $F(2, 289) = 4.09, p = 0.017$ ). Post-graduate students demonstrated a greater willingness to create their own jobs than undergraduate students and diploma holders, suggesting that completing higher level college programs results in developing enhanced abilities for creating self-employment and employment opportunities in tourism, because they had more sophisticated academic curriculum, greater experiential learning opportunities, and more exposure to entrepreneurial opportunities.

### Findings

An analysis has been done on the demographic characteristics of the 292 people who responded, revealing that the majority of respondents are between twenty-one and twenty-three years of age ( $n=39\%$ ) and the second-largest group was between eighteen and twenty years old ( $n=29\%$ ), with male respondents being slightly over half of the respondents (55%) and female respondents comprising slightly less than half of them at (45%). One and two-thirds (62%) of respondents to this survey identified themselves as undergraduates, while thirty-two percent were post-graduate students, and six percent were diploma students. A wealth of diversity exists amongst respondents with respect to their academic backgrounds, with students from tourism (30%), management (28%), and commerce (27%). A substantial portion of the respondents (74%) reported they had participated in entrepreneurship coaching prior to completing the survey and a further fifty-three percent reported they had been part of incubation programs, while seventy-five percent of the respondents expressed their desire to start their own tourism-related businesses in the future. The study has found that respondents exhibited moderate to high levels of entrepreneurial, innovation, and general business competencies related to the tourism industry (average mean score = 3.81), with the highest degree of competencies reported being financial skills, entrepreneurship knowledge and decision-making capability followed by the lowest degree of competencies exhibited in the areas of problem-solving skills, opportunity identification skills, and marketing skills. Therefore, the data from this survey indicate that university programs play a significant role in developing many of the basic skills related to entrepreneurship and tourism; however, continuing practical training and experiential learning opportunities should enable students to have additional opportunities

to improve these types of skills. Internship experience has had a very positive influence on the practical training of students to help them launch sustainable tourism ventures ( $t = 2.63, p < 0.05$ ). Interns also had significantly higher levels of knowledge about entrepreneurship, ability to develop a business plan, confidence to be innovative and awareness of sustainability, than did students who did not participate in an internship. This demonstrates the importance of practical experience to strengthen students' entrepreneurial competencies in tourism. According to the one-way ANOVA results, there were statistically significant differences in perceived readiness to be self-employed or employed within the tourism field among the three groups of students at the time of data collection ( $F(2, 289) = 4.09, p = .017$ ) and that PG students ( $M = 3.88$ ) were more ready than UG ( $M = 3.71$ ) and diploma ( $M = 3.55$ ) students to engage in either self-employment or paid employment in tourism. Therefore, higher levels of education seem to support the development of an individual's entrepreneurial competencies for pursuing careers in the tourism industry.

### **Conclusion**

This study emphasizes the importance of university incubators in supporting sustainable tourism entrepreneurship and innovation with a focus on protecting the environment among students. This study shows that being a part of incubators, gaining experience from practical training, and internships greatly improve students' knowledge about starting a business, ability to develop businesses, confidence in their ability to innovate, and understanding of sustainability. More advanced academic programs and structured experiential learning further enhance students' ability to create their own job or provide jobs in the tourism sector. Ultimately, university programs are effective catalysts for developing future tourism entrepreneurs who will establish sustainable and environmentally responsible businesses.

### **Future Implications**

For futurity practice, universities should increase incubators of entrepreneurship, sustainability focused academic programs, and empirical learning opportunities to better prepare students for establishing sustainable tourism enterprises. The increase in training; entrepreneurial competitions and coaching programs will enhance the students' capacity for creativity, problem-solving capability, and preparation for the workforce. A better connection with the tourism sector will provide students with an opportunity to work on real world problems through the development of their strategic thinking, green tourism initiatives, and incubators for new entrepreneurs. Future work may look at the long-term benefit of university incubators on students' entrepreneurial endeavours, environmental impacts and tourism development in their local communities. By implementing these initiatives, we ensure that tomorrow's entrepreneurs in tourism will be both innovative and environmentagUeT

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