

Introduction to Research Methodology: Exploring the Status and Recognition of STEM Entrepreneurship

Dear Readers,

Welcome to our research methodology, which aims to investigate the status and recognition of STEM entrepreneurship as a career path. This research employs a combination of in-depth interviews with stakeholders and interested parties, as well as a questionnaire designed for youth, to provide comprehensive insights into this important topic.

Background:

STEM entrepreneurship has garnered increasing attention as a promising avenue for innovation, economic growth, and societal impact. However, the extent to which it is recognized and valued as a viable career path, particularly among youth, remains an area of interest and inquiry.

Objective:

The primary objective of this research is to gain a deeper understanding of the status and level of recognition of STEM entrepreneurship in Bulgaria, Greece and Spain, with a specific focus on its appeal as a career path among young individuals. By exploring the perspectives, experiences, and perceptions of stakeholders and youth, we aim to identify key factors influencing the recognition and uptake of STEM entrepreneurship.

Methodology:

In-depth Interviews:

In-depth interviews are conducted with stakeholders and interested parties representing various sectors, including academia, industry, government, and non-profit organizations. These interviews provide qualitative insights into the current landscape of STEM entrepreneurship, including challenges, opportunities, and best practices. Stakeholders' perspectives is instrumental in identifying overarching trends and themes.

Step-by-Step Methodology for In-depth Interview Development:

Step 1: Defining Objectives

The objectives of the in-depth interviews with interested parties and stakeholders were defined, aiming to explore the status and level of recognition of STEM entrepreneurship as a career path, understand perceptions of social business, and examine the connection between these concepts and the Sustainable Development Goals (SDGs)

Step 2: Participant Selection

Stakeholders and interested parties from diverse backgrounds, including academia, industry, government, and non-profit sectors, were identified as potential interview participants. A purposive sampling method was used to ensure representation of different perspectives and experiences.

Step 3: Developing Interview Guide

An interview guide was developed to structure the conversation and ensure consistency across interviews. The guide included open-ended questions covering topics such as awareness, perceptions, challenges, opportunities, and recommendations related to STEM entrepreneurship, social business, and their alignment with SDGs.

Step 4: Pilot Testing

The interview guide was pilot tested with the project experts to assess its effectiveness in eliciting relevant information and to identify any areas for improvement. Feedback from the pilot test was used to refine and finalize the interview guide.

Step 5: Conducting Interviews

In-depth interviews were conducted with selected participants, either in person, over the phone, or via video conferencing, based on participant preferences and logistical considerations. Each interview was recorded with the participant's consent to ensure accuracy in data capture.

Step 6: Data Collection

During the interviews, participants were encouraged to share their perspectives, experiences, and insights related to STEM entrepreneurship, social business, and their connection with SDGs. Probing questions were used to delve deeper into specific topics and explore diverse viewpoints.

Step 7: Transcription and Analysis

Interview recordings were transcribed verbatim, and transcripts were analyzed using thematic analysis techniques to identify patterns, themes, and key insights. Codes were applied to segments of text to categorize and organize data for further interpretation.

Step 8: Interpretation and Reporting

The findings from the interviews were interpreted in the context of the research objectives, focusing on common themes, divergent viewpoints, and areas of consensus. Key findings were summarized and synthesized to provide a comprehensive understanding of the status and recognition of STEM entrepreneurship, social business, and their connection with SDGs.

Step 9: Review and Validation

The interview findings were reviewed and validated by comparing them with existing literature, theoretical frameworks, and expert opinions. Any discrepancies or inconsistencies were addressed through further analysis or additional interviews.

Step 10: Reporting and Dissemination

The results of the in-depth interviews were documented in a research report or manuscript, which included detailed descriptions of the methodology, key findings, interpretations, and implications. The report was disseminated through publications, presentations, social media posts or other relevant channels to share insights with stakeholders, policymakers, and the broader community.

Questionnaire for Youth:

A structured questionnaire is administered to youth to assess their awareness, perception, and interest in STEM entrepreneurship as a career path. The questionnaire is designed to gather quantitative data on factors such as familiarity with STEM entrepreneurship, perceived importance, and barriers to entry. Additionally, open-ended questions allow qualitative insights into youths' motivations, aspirations, and concerns related to STEM entrepreneurship.

Step-by-Step Methodology for Questionnaire Development:

Step 1: Defining Objectives

The objectives of the questionnaire were clearly defined, aiming to assess the level of recognition and understanding of STEM entrepreneurship as a career path, evaluate the awareness and perception of social business, and explore the connection between these concepts and the Sustainable Development Goals (SDGs).

Step 2: Designing Questionnaire Structure

A structured questionnaire was developed with distinct sections focusing on STEM entrepreneurship, social business, and their alignment with SDGs. The questionnaire was organized to cover areas such as awareness, perception, importance, and potential barriers related to these concepts.

Step 3: Developing Questions

Questions were developed to address various aspects of STEM entrepreneurship, social business, and their connection with SDGs. This included questions about awareness levels, factors influencing interest, perceived importance, and suggestions for promoting these concepts in alignment with SDGs.

Step 4: Pilot Testing with project experts

A pilot test of the questionnaire was conducted with the project experts to identify any issues with question clarity, wording, or relevance. Feedback from the pilot test was used to refine and improve the questionnaire before finalization.

Step 5: Finalizing Questionnaire

Based on the feedback received during the pilot test, revisions were made to the questionnaire to ensure clarity, coherence, and relevance. The final version of the questionnaire was then prepared for distribution to the target population.

Step 6: Determining Sample Size and Sampling Method

The target population for the questionnaire was identified (young people between 15-29 years), and an appropriate sample size was determined based on research objectives and available resources. A sampling method, such as random sampling or convenience sampling, was selected to recruit respondents from the target population.

Step 7: Data Collection

The questionnaire was distributed to the selected sample population through various channels, including online surveys, email invitations, and social media platforms. Clear instructions were provided for completing the questionnaire, and assurances of confidentiality were given to encourage participation.

Step 8: Data Analysis

Responses collected from the questionnaire were collated and analyzed using statistical methods for quantitative data and thematic analysis for qualitative data. Descriptive statistics and thematic summaries were generated to identify trends, patterns, and insights.

Step 9: Interpretation and Reporting

The findings from the questionnaire analysis were interpreted in the context of the research objectives. Key findings, trends, and insights were summarized and presented through tables, charts, and narrative summaries. Implications of the findings were discussed, and recommendations for future actions were provided.

Step 10: Review and Dissemination

The questionnaire methodology, findings, and report were reviewed for accuracy and completeness. The results of the questionnaire were disseminated through reports, presentations, or publications to share insights with stakeholders, policymakers, and the broader community.

Data Analysis:

Qualitative data from in-depth interviews is analyzed using thematic analysis techniques to identify patterns, themes, and insights.

Quantitative data from the questionnaire is analyzed using statistical methods to generate descriptive statistics and identify trends.

Triangulation of qualitative and quantitative findings are conducted to provide a comprehensive understanding of the research topic.

Ethical Considerations:

Participants' anonymity and confidentiality is ensured throughout the research process.

Informed consent are obtained from all participants prior to their involvement in the study.

Ethical guidelines and standards for research involving human subjects are strictly adhered to.

Conclusion:

This research methodology seeks to shed light on the status and recognition of STEM entrepreneurship as a career path, drawing on the perspectives of stakeholders and youth. By employing a mixed-methods approach, we aim to uncover valuable insights that can inform policies, programs, and interventions aimed at fostering a supportive ecosystem for STEM entrepreneurship and will be base for development of educational resources and educational sessions with youth (15-29).

Thank you for your interest in our research methodology. We look forward to sharing our findings and contributing to the advancement of knowledge in this important area.

Warm regards,
The team of STUDeEntrepreneurs

Analysis Matrix

An in-depth interview matrix is a tool used to organize and analyze data collected from in-depth interviews. It consists rows representing individual interview participants and columns representing key themes, topics, or questions explored during the interviews.

In this matrix:

- Each row corresponds to a different interview participant (identified by Participant ID).
- Columns represent demographic information (e.g., Age, Gender, Education), as well as key themes or topics discussed during the interviews (e.g., Awareness of STEM Entrepreneurship, Perception of Social Business, Connection with SDGs).
- Participants' responses to each theme or topic are summarized concisely in the respective cells.
- The "Key Insights/Quotes" column may include notable quotes or insights provided by participants during the interviews.

Structure:

Matrix - In depth-interview with stakeholders and interested parties

Part I. Demographic data

Respondent ID	Age	Gender	Education	Occupation	Country
R001					
R002					
R					

Part II. Main Questions

Introduction and Background			
Respondent ID	Role or involvement in the STEM education or entrepreneurship ecosystem (Q1)	STEM definition and importance (Q1.1)	examples of successful STEM entrepreneurship ventures with social or environmental impact (Q1.2.)
R001			
R002			
Awareness and Perception			:

Respondent ID	Recognition and status of STEM entrepreneurship within educational institutions and in the wider community (Q2)	Awareness of the opportunities and potential of STEM entrepreneurship (Q2.1.)	Concept and role of social business for societal and environmental challenges (Q2.2.)
R001			
R002			
Challenges and Barriers			
Respondent ID	In your opinion, are these support systems adequate, and how could they be improved or expanded to better facilitate STEM entrepreneurship initiatives (Q3)	In your experience, what are the main challenges or barriers that individuals face when considering STEM entrepreneurship as a career path? (Q3.1.)	Have you observed any specific obstacles or systemic issues that hinder the promotion or development of STEM entrepreneurship initiatives? (Q3.2.)
R001			
R002			
Support and Resources			
Respondent ID	Support mechanisms and resources available to individuals interested in pursuing STEM entrepreneurship (Q4)	Adequation of support systems and improvement for better facilitation of STEM entrepreneurship initiatives (Q4.1.)	
R001			
R002			

Role of Education and Training					
Respondent ID	STEM education programs for better preparation of students in the field of entrepreneurship and innovation (Q5)		Specific skills or competencies that are crucial for aspiring STEM entrepreneurs (Q5.1.)		
R001					
R002					
Engagement and Collaboration					
Respondent ID	Collaborations between	Successful examples of	Connection between	SDGs relevant to	Collaboration and

	educational institutions, industry, partners and government for promotions of STEM entrepreneurship (Q6)	collaborations and initiatives promoted STEM entrepreneurship (Q6.1.)	STEM entrepreneurship and the SDGs (Q6.2.)	STEM entrepreneurship and social business (Q6.3.)	contribution between stakeholders for advancing STEM entrepreneurship and social business in alignment with the SDGs (Q6.4.)
R001					
R002					
Success Stories and Role Models					
Respondent ID	Successful stories and examples of STEM entrepreneurship with notable success (Q7)	Influence and perceptions of successful stories of STEM entrepreneurship (Q7.1.)	Advice for aspiring entrepreneurs in STEM entrepreneurship with a focus on social and environmental impact (Q7.2.)		
R001					
R002					
Policy and Advocacy					
Respondent ID	Role of the government policies and initiatives in promotion of STEM entrepreneurship (Q8)		Support and advocate of policymakers and advocacy for the recognition and development of STEM entrepreneurship as a career path (Q8.1.)		
R001					
R002					
Future Outlook and Recommendations					
Respondent ID	Future outlook for STEM entrepreneurship, and steps to enhance its recognition and status	Recommendations and suggestions for more supportive and conducive environment for STEM entrepreneurship (Q9.1.)	Future of STEM entrepreneurship and social business in the context of SDGs (Q9.2.)		

:

	(Q9)		
R001			
R002			
Closing Remarks			:
Respondent ID	Additional comments (Q10)		
R001			
R002			

A questionnaire matrix, also known as a data analysis matrix, is a tool used to organize and analyze data collected from questionnaires. It typically consists of rows representing individual respondents and columns representing the survey questions.

Structure:

Matrix – Questionnaire for young people 15-29

Part I. Demographic data

Respondent ID	Age	Gender	Education	Country
R001				
R002				
R				

Part II. Main Questions

STEM Education and social business							
Respondent ID	Are you currently studying or interested in studying subjects related to STEM (Q1)	What aspect of STEM interests you the most? (Q1.1.)	How do you think STEM education can benefit individuals and society? (Q1.2.)	How familiar are you with the concept of social business? (Q1.3.)	Can you provide a brief definition of social business based on your understanding? (Q1.4.)	Do you think there are opportunities for integrating STEM entrepreneurship with social business concepts to address societal challenges? (Q1.5.)	Examples and ideas of combination between STEM entrepreneurship and social business (Q1.6.)
R001	<input type="checkbox"/> Yes	<input type="checkbox"/> Science		<input type="checkbox"/> Very		<input type="checkbox"/> Yes	

	<input type="checkbox"/> No	<input type="checkbox"/> Technology <input type="checkbox"/> Engineering <input type="checkbox"/> Mathematics		familiar <input type="checkbox"/> Somewhat familiar <input type="checkbox"/> Not familiar		<input type="checkbox"/> No <input type="checkbox"/> Unsure	
R002							
R.....							

Awareness of SDGs					
Respondent ID	Have you heard of the Sustainable Development Goals (SDGs) set by the United Nations? (Q2)	Can you name any SDGs? If yes, please list them (Q2.1.)	In your opinion, which SDG(s) do you think are most relevant to STEM fields? Why? (Q2.2.)	How do you perceive the connection between STEM entrepreneurship and the SDGs? (Q2.3.)	In what ways do you think social businesses contribute to the achievement of the SDGs? (Q2.4.)
R001	<input type="checkbox"/> Yes <input type="checkbox"/> No				
R002					
R.....					

Integration of STEM and SDGs		
Respondent ID	Do you think there is a connection between STEM education and achieving the SDGs? (Q3)	How can STEM education contribute to addressing global challenges outlined in the SDGs? (Q3.1.)
R001		
R002		
R.....		

Engagement and Opportunities				
Respondent ID	Have you participated in any STEM-related activities (e.g., workshops,	If yes, please briefly describe your experience and its impact on your understanding	Do you see opportunities for integrating STEM entrepreneurship with social business concepts to	If yes, can you provide examples or ideas of how this integration could be

	competitions, clubs) focusing on sustainability or addressing social issues (Q4)	of STEM and sustainability. (Q4.1.)	address SDGs effectively? (Q4.2.)	implemented? (Q4.3.)
R001	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure	
R002				
R.....				

Awareness and Perception							
Respondent ID	Have you heard about STEM entrepreneurship as a potential career path before taking this survey? (Q5)	How would you rate your level of understanding of STEM entrepreneurship? (Q5.1.)	In your opinion, what does STEM entrepreneurship entail? (Q5.2.)	Can you provide a brief definition of STEM entrepreneurship based on your understanding? (Q5.3.)	How familiar are you with the concept of social businesses? (Q5.4.)	In your opinion, how important is social business for addressing social and environmental challenges? (Q5.5.)	Do you believe that social businesses are adequately recognized and supported in your community or country? (Q5.6.)
R001	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Very low <input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High <input type="checkbox"/> Very high			<input type="checkbox"/> Very familiar <input type="checkbox"/> Somewhat familiar <input type="checkbox"/> Not familiar	<input type="checkbox"/> Very important <input type="checkbox"/> Important <input type="checkbox"/> Somewhat important	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure

						<input type="checkbox"/> Not important	
R002							
R.....							

Interest and Motivation			
Respondent ID	Are you personally interested in pursuing entrepreneurship in a STEM-related field as a career path? (Q6)	If yes, what motivates you to consider STEM entrepreneurship? (Q6.1.)	If no, what are the main factors that deter you from considering STEM entrepreneurship? (Q6.2.)
R001	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Desire for innovation <input type="checkbox"/> Passion for a particular STEM field <input type="checkbox"/> Potential for impact or societal benefit <input type="checkbox"/> Financial potential <input type="checkbox"/> Desire to solve real-world problems <input type="checkbox"/> Influence from role models or mentors Other:	
R002			
R.....			

Perceived Challenges and Barriers		
Respondent ID	What do you perceive as the main challenges or barriers to pursuing STEM entrepreneurship? (Q7)	Have you encountered any specific challenges or obstacles related to STEM entrepreneurship personally? If yes, please describe. (Q7.1.)
R001	<input type="checkbox"/> Lack of access to funding or investment opportunities <input type="checkbox"/> Limited entrepreneurial support or resources <input type="checkbox"/> Fear of failure	

	<input type="checkbox"/> Limited networking opportunities <input type="checkbox"/> Insufficient knowledge or skills in entrepreneurship Other:	
R002		
R.....		

Support and Resources		
Respondent ID	Are there any existing support networks or resources in your community or educational institution for aspiring STEM entrepreneurs? (Q8)	If yes, please briefly describe the types of support available and their effectiveness. (Q8.1)
R001	<input type="checkbox"/> Yes <input type="checkbox"/> No	
R002		
R.....		

Role Models and Inspiration		
Respondent ID	Can you name any successful STEM entrepreneurs or companies that inspire you? (Q9)	How do these role models influence your perception of STEM entrepreneurship as a career path? (Q9.1)
R001		
R002		
R.....		

Future Plans				
Respondent ID	Would you consider pursuing a career or further education in a STEM field with a focus on addressing global challenges and sustainability? (Q10)	If yes, what steps do you plan to take to pursue this goal? (Q10.1)	Have you ever considered starting a business with a focus on addressing societal or environmental issues? (Q10.2.)	Why or why not? (Q10.3)
R001	<input type="checkbox"/> Yes		<input type="checkbox"/> Yes	

	<input type="checkbox"/> No		<input type="checkbox"/> No	
R002				
R.....				

Recognition and Importance of STEM Entrepreneurship				
Respondent ID	In your opinion, how important is STEM entrepreneurship for driving innovation and economic growth? (Q11)	Do you believe that STEM entrepreneurship is adequately recognized and supported in your community or country? (Q11.1)	How important do you think social business is for addressing societal and environmental challenges? (Q11.2.)	Do you believe social businesses are adequately recognized and supported in your community or country? (Q11.3.)
R001	<input type="checkbox"/> Very important <input type="checkbox"/> Important <input type="checkbox"/> Somewhat important <input type="checkbox"/> Not important	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure	<input type="checkbox"/> Very important <input type="checkbox"/> Important <input type="checkbox"/> Somewhat important <input type="checkbox"/> Not important	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure
R002				
R.....				
Closing Remarks				
Respondent ID	Additional comments			
R001				
R002				
R.....				

Annex I.

Ensurance for Anonymity and Confidentiality:

Participants' anonymity and confidentiality are paramount in this research process. All information provided by participants will be kept strictly confidential and will not be disclosed to anyone outside the research team without explicit permission from the participant. Any data collected will be coded to ensure anonymity, and only aggregated, anonymized data will be used in reporting and analysis. Participants' identities will not be revealed in any publications or presentations resulting from this research.

Annex II.

Informed Consent for Participants:

Before participating in the study, participants will be provided with a detailed explanation of the research objectives, procedures, potential risks and benefits, and their rights as participants. They will be given the opportunity to ask questions and seek clarification about any aspect of the study. Participants will be informed that their participation is voluntary, and they have the right to withdraw from the study at any time without consequence. Once they have fully understood the information, participants will be asked to provide written consent before proceeding with their involvement in the research.

Annex III.

Ethical Guidelines and Standards for Research Involving Human Subjects:

Respect for Participants:

Researchers must respect the dignity, autonomy, and rights of all participants involved in the research. Participants should be treated with fairness, respect, and sensitivity throughout the research process.

Informed Consent:

Participants must be fully informed about the purpose, procedures, risks, and benefits of the research before they agree to participate. Informed consent should be obtained voluntarily, without coercion or undue influence, and participants should be given the opportunity to withdraw from the study at any time.

Confidentiality and Anonymity:

Researchers must ensure that participants' privacy and confidentiality are protected at all times. Any information collected from participants should be kept confidential and anonymized to prevent the identification of individual participants.

Minimization of Harm:

Researchers should take measures to minimize any potential harm or discomfort to participants during the research process. This includes avoiding sensitive or invasive topics, providing support services if needed, and debriefing participants after the study to address any concerns.

Integrity in Research Practices:

Researchers must conduct their research with honesty, integrity, and transparency. They should adhere to professional and ethical standards, accurately report their findings, and avoid any form of misconduct, including plagiarism or falsification of data.

Respect for Cultural Diversity:

Researchers should respect the cultural beliefs, practices, and values of participants, and ensure that their research is conducted in a culturally sensitive and appropriate manner.

Adherence to these ethical guidelines and standards is essential to ensure the integrity, validity, and ethical conduct of research involving human subjects.

Annex IV.

Informed Consent Form

Title of Study: Exploring the Status and Recognition of STEM Entrepreneurship and Social Business in Alignment with Sustainable Development Goals

Principal Investigator:
[Researcher's Name]

Introduction:

You are being invited to participate in a research study conducted by
.....
[Researcher's Name]

at
[Institution/Organization]

, aimed at exploring the status and recognition of STEM entrepreneurship and social business, and their alignment with the Sustainable Development Goals (SDGs).

Before deciding whether to participate, it is important for you to understand the purpose of the study, what your participation will involve, and your rights as a participant.

Purpose of the Study:

The purpose of this study is to gain insights into the level of recognition and understanding of STEM entrepreneurship and social business, as well as their connection with the Sustainable Development Goals (SDGs). Your participation will contribute to a better understanding of these topics and may help inform future policies and initiatives aimed at promoting sustainable development through entrepreneurship.

Procedures:

If you agree to participate, you will be asked to complete a questionnaire and/or participate in an in-depth interview. The questionnaire will involve answering a series of questions related to your awareness, perception, and understanding of STEM entrepreneurship, social business, and their alignment with the SDGs. The in-depth interview will involve a one-on-one discussion with the researcher, where you will have the opportunity to share your experiences, perspectives, and insights on the topic.

Risks and Benefits:

Participation in this study involves minimal risks. Some participants may feel uncomfortable discussing certain topics during the interview, but you are free to skip any questions or withdraw from the study at any time without consequence. The benefits of participating include

contributing to research that may help inform policies and initiatives aimed at promoting sustainable development through entrepreneurship.

Confidentiality:

Your participation in this study will be kept strictly confidential. Any information you provide will be anonymized and only used for research purposes. Your name and any identifying information will not be disclosed in any reports or publications resulting from this study.

Voluntary Participation:

Participation in this study is voluntary, and you are free to withdraw at any time without consequence. If you decide to withdraw, any data collected up to that point will be destroyed, and your decision will be respected without question.

Contact Information:

If you have any questions about the study or your rights as a participant, please feel free to contact

.....
[Researcher's Name]

at
[Contact Information]

Consent:

By signing below, you indicate that you have read and understood the information provided in this consent form, that any questions you have about the study have been answered to your satisfaction, and that you voluntarily agree to participate in this research study.

Participant's Signature:Date:

Researcher's Signature:Date:.....