

2024 Triple Helix & ACEEU Conference

São Paulo

**Triple Helix and
Impact Innovation:**

Connecting Smart Talent
and Disruptive Technologies
for a Better Tomorrow

June 19-21, 2024

**Book
OF
Abstracts**

Title: Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow
Event: 22nd Triple Helix International Conference
Organizers: Triple Helix Association
Date: June 19-21, 2024
Location: Faculty of Economics, Business and Accounting, University of São Paulo (FEA USP), São Paulo, Brazil
Editors: International Scientific Committee, Triple Helix Association
Subjects: Innovation, University-Industry-Government Relations, Innovation Ecosystems, Innovation Management
Category: Conference Proceedings

ORGANIZERS

Aline Figlioli, Fundação Instituto de Administração, FIA, Brazil
Claudia Sofia Frias Pinto, University of São Paulo (FEA USP), Brazil
Fernando de Oliveira Linhares, University of São Paulo (FAUD USP), Brazil
Marcelo Gonçalves do Amaral, Federal Fluminense University, Brazil
Moacir de Miranda Oliveira Jr, University of São Paulo (FEA USP), Brazil
Rafael Moraes Pereira, University of São Paulo (FEA USP), Brazil

2024 Triple Helix & ACEEU CONFERENCE

PRESENTATION



2024
Triple Helix & ACEEU
CONFERENCE

With over 200 participants

Dear readers,

We are delighted to present this collection of proceedings, which aligns with the 22nd International Conference of the Triple Helix Association, hosted by the School of Economics, Business and Accounting of the University of São Paulo (FEAUSP), in collaboration with the Triple Helix Association, ACEEU, and the Innovation Agency of the University of São Paulo. Held in the dynamic city of São Paulo from June 19th to June 21st, 2024, this year's conference brought together over 200 scholars, researchers, policymakers, and industry leaders under the theme "Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow."

Over the course of the conference, participants had the opportunity to engage with a diverse range of discussions and sessions. The program featured 19 ordinary sessions, with 68 papers presented, 7 plenary sessions, 8 semi-plenary sessions, 2 poster sessions where 27 posters were displayed, as well as practical sessions led by ACEEU. This wide array of activities provided an enriched environment for exploring the latest research, strategies, and practical applications within the Triple Helix model.

The conference also included several important parallel events: the EU-China-Latin America Innovation Forum, the CEPID Aries Anti-Microbial Resistance Symposium, and the 7th SciBiz Conference (Science Meets Business) from the University of São Paulo. These events offered unique platforms for dialogue between diverse regions and sectors, reinforcing the global relevance of the Triple Helix model in addressing innovation challenges.

The conference was made possible through the generous support of the University of São Paulo, the Administration Institute Foundation (FIA SP), FAPESP, CNPq, CAPES, and CEPID Aries. Their contributions were vital in ensuring the success of the event and in fostering impactful discussions on how collaboration between academia, industry, government, and society can drive innovation and sustainable development.

Throughout the event, we explored forward-thinking strategies and disruptive technologies that have the potential to shape a better tomorrow. Esteemed speakers, distinguished scholars, and passionate innovators shared their expertise on how to connect talent, research, and cutting-edge technologies to address some of the world's most pressing challenges.

We express our heartfelt thanks to all the Sponsors, Partners, Organizing Committee, International Scientific Committee, and members who worked tirelessly to bring this event to life. Their dedication continues to inspire the advancement of innovation ecosystems and the creation of meaningful, sustainable impact.

We hope these proceedings spark curiosity and further engagement with the ideas and research presented. For those looking for more, the Triple Helix Journal will soon publish selected papers from the conference in an upcoming issue.

Finally, we look forward to continuing this important dialogue and invite you to join us at the 23rd International Triple Helix Conference in 2025.

Happy reading!



Prof. Dr. Moacir de Miranda Oliveira Júnior

COMMITTEES



2024
Triple Helix & ACEEU
CONFERENCE

COMMITTEES

SCIENTIFIC COMMITTEE MEMBERS

Moacir de Miranda Oliveira Jr, University of São Paulo (FEA USP), Brazil
Aline Figlioli, Fundação Instituto de Administração, FIA, Brazil
Yuzhuo Cai, Tampere University, Finland
Josep Piqué – PhD, Ecosystems of Innovation
Marcos Gómez – PhD, Innovation Culture
Alexander Heichlinger – Master's degree, Business Administration and Management
Emanuele Fiore – Technologist Director – Institute for Polymers, Composites and Biomaterials
IPCB – National Research Council of Italy – CNR
Jorge Audy – PhD, Information Systems
Virginia Trigo – PhD, Entrepreneurship and Strategic Management
Clarisa Stefani – Postdoctoral and PhD, Production Engineering
Riccardo Viale – Secretary General Behavioral Economics of Entrepreneurship
Carina Rapetti – PhD in Innovation Ecosystems, TH General Manager
Adriana Marotti de Mello – University of São Paulo (FEA USP), Brazil
Alceu Salles Camargo Jr. – University of São Paulo (FEA USP), Brazil
Aline Mariane Faria – FEI University, Brazil
Ana Cláudia Azevedo – Federal University of Viçosa, Brazil
Andrzej H. Jasinski – University of Warsaw, Poland
Einar Rasmussen – Nord Universitet, Norway
Han Woo Park – YeungNam University, South Korea
James S. Dzisah – University of Ghana, Ghana
Joaquin Maria Azagra Caro – Polytechnic University of Valencia, Spain
Marcos Lima – Skema Business School, France
Mariza Almeida – Federal University of the State of Rio de Janeiro (UNIRIO), Brazil
Mark Deakin – Edinburgh Napier University, Scotland
Michele Coletti – Grenoble Ecole de Management, France
André Luis Rossoni – University of São Paulo (FEA USP), Brazil
Arthur Silva Santos – University of São Paulo (FEA USP), Brazil
Artur T. Vilas Boas Ribeiro – University of São Paulo (EP USP), Brazil
Diogo Barbosa Leite – Escola Superior de Propaganda e Marketing (ESPM), Brazil
Edilane dos Reis Carraro – Federal Fluminense University (UFF), Brazil
Fernanda Sayuri Yoda – University of São Paulo (FEA USP), Brazil
Fernando de Oliveira Linhares (FAU USP), Brazil
João Paulo Nascimento da Silva – University of São Paulo (FEA USP), Brazil
Leandro Lima dos Santos – University of São Paulo (FEA USP), Brazil
Leonardo Bastos da Fonseca – University of São Paulo (FEA USP), Brazil
Lucas Emmanuel Nascimento Silva – University of São Paulo (FEA USP), Brazil
Marcela Sayumi de Souza Ito – Federal Fluminense University (UFF), Brazil
Marina Cerqueira Marinho – University of São Paulo (FEA USP), Brazil
Matheus Graciani dos Santos – University of São Paulo (FEA USP), Brazil
Natan de Souza Marques – Cruzeiro do Sul University (UNICSUL), Brazil
Pedro Mascarenhas de Barros – University of São Paulo (FEA USP), Brazil
Rafael Toassi Crispim – University of São Paulo (FEA USP), Brazil
Rafaela Ferreira Maniçoba – University of São Paulo (FEA USP), Brazil
Ronaldo de Oliveira Santos Jr. – University of São Paulo (FEA USP), Brazil
Sheila Serafim da Silva – Fundação Instituto de Administração (FIA), Brazil

COMMITTEES

COORDINATION

Marcelo Gonçalves do Amaral, Federal Fluminense University, Brazil

Claudia Sofia Frias Pinto, University of São Paulo (FEA USP), Brazil

Rafael Morais Pereira, University of São Paulo (FEA USP), Brazil

STEERING COMMITTEE

Moacir de Miranda Oliveira Jr, University of São Paulo (FEA USP), Brazil

Aline Figlioli, Fundação Instituto de Administração, FIA, Brazil

Luiz Henrique Catalani, Coordinator - AUSPIN

Josep Piquè, Triple Helix Association

Carina Rapetti, THA - Triple Helix Association - General Manager

Thorsten Kliewe, ACEEU

AWARDS COMMITTEE

Marcelo Gonçalves do Amaral, Federal Fluminense University, Brazil

Josep Piquè, THA – Triple Helix Association

Yuzhuo Cai, Tampere University, Finland

Josep Piquè, THA – Triple Helix Association

Carina Rapetti, THA - Triple Helix Association - General Manager

Riccardo Viale, Università degli Studi di Milano-Bicocca | UNIMIB

Marcos Gómez, PhD, Innovation Culture

Alexander Heichlinger, Master's degree, Business Administration and Management

Emanuele Fiore, Technologist Director - Institute for Polymers, Composites and Biomaterials IPCB - National Research Council of Italy- CNR

Jorge Audy, PhD, Information Systems

Virginia Trigo, PhD, Entrepreneurship and Strategic Management

Clarisa Stefani, Postdoctoral and PhD, Production Engineering



TABLE OF CONTENTS

2024

Triple Helix & ACEEU
CONFERENCE

01

Impact Innovation Strategies

Public Funding Of Innovative Biotech Projects And Its Effectiveness In The Early Stages Of Development Of Biopharmaceutical Industry 12

Eco-Innovation In The Context Of Greenhouse Gas Mitigation: A Systematic Literature Review 18

Open Innovation Development In The Health Sector: The Case Of The Joint Venture Genesis 23

Optimization Process And Anticancer Biological Activity Of Pau-D'arco Extract 28

The Value Of Using A System For Medical-Hospital Equipment Management In Public Hospitals 32

Curar Saúde: Breaking Down Obstacles In Health Communication And Promotion 38

Deep Techs And Society's Great Challenges: The Case Of Moderna In Facing Covid-19 42

02

Talent Development and Collaboration

Diversity And Inclusion As A Counterpoint To Scientific Management And The Efficiency Paradigm 47

Evaluating Learning Factories Through The Lens Of The Triple Helix Model: A Case Study Of Fábrica Do Futuro 50

Forging Pathways To Success: Leveraging Triple Helix Collaboration To Tackle Bacterial Resistance Challenges 53

Pgi: Training Program Aimed At Catalyzing Innovation And Entrepreneurship Within The Usp Ecosystem Through Auspin Initiatives 57

Navigating Work And Skills Transformation: Strategic Policies For Talent Development And Collaboration 60

Psychological Safety In Pluri-Intelligent Cities : Digital Citizenship In Transformation 64

Using Metagame For Hiring Process: A Case About New Members Recruitment Process 68

03

Disruptive Technologies and Sustainable Development

Workforce Management Implementation In Energy Sector: Challenges, Opportunities, And Strategies 74

How Foresight And Horizon Scanning Shape Emerging Technologies And Disruptive Innovations Research? 77

Innovation Management In The Age Of Ai: Evidence From The Healthcare Industry 81

Wysiwyg Software: Lighting Solutions For The Stage Space 86

The Innovation Diplomacy And The Integration Of Innovation Ecosystems Based On Green Hydrogen 91

Encapsulation Of Pau Rosa Essential Oil In Cationic Liposomes: A Nanotechnological Approach For The Perfumery Industry 95

Artificial Intelligence And Decision Making 99

04

Better Tomorrow-Engagement for Social and Environmental Impact

Institutional Void And Guardians Of The Pirarucu In The Amazon. 104

Triple Helix & Innovation: A Study In A Context Of Mining-Dependence 108

Innovative Lipid Nanosystems Loaded With Pepper Rosemary Essential Oil For Combating Fungal Infections 112

The Protection Of Intellectual Property Rights In The Legal Framework For Innovation 116

A Triple Helix Approach To Assist University In Facing The Social Challenge Of Inclusion In The Workplace 122

05

Triple Helix Model in Practice around the world

University Policies & Innovation: A Cluster Analysis 127

The Performance Of The Public Sector In The Innovation Ecosystem Of The Municipality Of Criciúma, Santa Catarina 131

Evolution Of The Triple Helix As An Academic Movement – Bibliometric Analysis Of Communications At Conferences 136

Democratizing Innovation: The 10:10:10:10 Vision Of Triple Helix Nigeria 139

Transforming Public Health Through Triple Helix Collaboration: Insights From The Ideiagov Program 141

Intersections Of Academia, Industry, And Government That Shape The Future Of Innovation: Opportunities And Challenges From The South African Clothing Industry 146

Challenges Of Knowledge And Technology Appropriation In Rural Properties In An Emerging Innovation Ecosystem 150

Enhancing The Employability Of Nigerian Engineering Graduates By Efficient University-Industry-Government Partnerships 153

The Impact Of A Modified Quadruple Helix On Establishing Timor-Leste's Innovation Ecosystem 158

University Alliances: Lessons Learned From The Alliance For Innovation In Porto Alegre, Rs - Brazil 162

Expanding The Reach Of Active Mobility Through The Promotion Of Sustainable Transport And Inclusive Infrastructure Development In The Living Lab Of The University City Of Federal University Of Rio De Janeiro 166

Technology Parks As Promoters Of Sustainable Innovation From The Perspective Of The Five Helix: Case Study Of The Belo Horizonte Technology Park 171

06

Government Policies and Governance for Impactful Innovations

Social Entrepreneurship And Female Entrepreneurship: From Public Policies To Support Networks 180

Regulatory Changes For Economies Of Scale In Carbon Capture In Brazil. 183

Governance In The Application Of Resources In Actions To Combat Deforestation In The Amazon Forest: Amazon Fund Case Study. 188

The Role Of Intellectual Property In Innovation Diplomacy 192

Public Resources For Financing Innovation: Brazilian Scenario 196

Triple Helix – Subsystems Government And Academic: Cistem's Program In Brazilian Semi-Arid Region 200

Zhongguancun Science Park Como Estratégia Governamental De Impacto Para O Ecossistema Da Inovação 203

Brazilian Universities As Contractors In Public Procurement For Innovation: Opportunities And Challenges 206

Innovation Ecosystems And Their Role In Fostering Entrepreneurship: A Study On The Role Of The Empresa Nacional De Parques De Ciência E Tecnologia De Maluana (Maluana National Company Of Science And Technology Parks In Mozambique) 210

Innovation In Public Contracts: An Analysis Of Implementation In Brazilian States 213

Innovation Policies As Promoters Of Sustainability Through The Quintuple Helix: A Case Study In A Higher Education Institution (Hei) In Brazil 218

07

Entrepreneurship and Startups in Impact Innovation

In Search Of A Framework For Deep
Tech's Entrepreneur Change - A Case
Study 223

Impact Innovation: An Analysis Of The
Integration Of Startups In The Innovation
Challenge@Bin 227

A Bibliometric Study On The Growth Of
Research In Science-Based Startups 232

Sebrae São Paulo's Experience In
Fostering Scientific Startups In The State
Of São Paulo: The Case Of "Lab Vendas
Startups Científicas" 236

Startups Strategies For Impactful
Innovation: How Open Innovation
Influences Product And Services
Innovation And Organizational Performan-
ce On Brazilian Startups 239

Vírgula Innovation Hub Vr – Triple Helix In
Practice 242

A University Spinoff Creation Journey And
How Its Collaborations With Academia
And Government Have Helped It In Its
Pathway To The Market 245

08

Collaborative Research and Development

The Open And Collaborative Research
Practices Through The Open Innovation
In Science (Ois) In Science And Technolo-
gy Parks: A Case Study 251

Innovation In Healthcare From The
Perspective Of Technology Maturity
Levels: A Proposal For Practical Harmoni-
zation From The Brazilian Institutional
Context 256

Economic Impacts Of Digital Health
Maturity: Proposal Of A Model For
Measurement And Analysis 261

Fostering Innovation Within Bounds:
Freedom Of Contract And Principles Of
Public Administration In Research And
Development Partnerships 267

Professional Certification: The Necessary
Skills In Mediating Technology Transfer
Agreements 271

Optimizing Dental Treatments Through
Digital Workflow And Innovative Material
Use 275

The Emergence Of The Entrepreneurial
University In Agroindustrial Regions: The
Case Of The State Of Mato Grosso, Brazil
279

Scientific Partnerships And Knowledge
Transfer On Dna Recombinant 282

Interplay Between Ecosystem Types:
Review And Agenda For Future Research
286

Intermediary Management Models For
Technology Transfer 290

University-Industry Interaction Channels
In Dynamic Environments: A Framework
Proposed Inspired By The Ufrj Science
Park 294

Public Policies For Innovation And
Electrification In The Automotive Sector:
Examples From The Usa, China And
Germany 298

Fostering Collaboration To Combat
Antimicrobial Resistance In Brazil: The
Cepid Aries Ecosystem 301

Implementing The Triple Helix Model:
Collaborative Approach To Sustainable
Soil Remediation Strategy 303

Design Instructional For The Translation
Of Scientific 307

Critical Success Factors In Technology
Transfer: Case Study Involving Digital
Technologies 310

Building Innovative Universities: A New
Framework For Dynamic Capabilities In
Open Innovation 314

09

Collaborative Research and Development

Entrepreneurial Universities In The
Context Of A Small Country: Lessons
Learned And Impact On Innovation
Ecosystem 319

Sustainable Entrepreneurial University:
An Integrative Review 324

Motivations And Challenges: The
Endeavor Of Sustainable Entrepreneurs
328

The Case Of Steamlab At The University
Of São Paulo: Space Of Innovation In
Education 332

10

Evaluating Impact and Sustainability

Empowering Sustainable Innovation: A Quadruple Helix Approach 338

An Analysis Of Efficiency And Technical Progress On Public Health Services In The State Of Amazon 341

University, Business, And Technology: A Case Study Of Implementing A Junction Approach 344

The Fostering Innovation In The Universidade Federal Do Recôncavo Da Bahia (Ufrb) Influence's Area: A Triple Helix Analytical Model 347

11

Awards

Awards 350

01

Impact Innovation Strategies

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Public Funding of Innovative Biotech Projects and its Effectiveness in the Early Stages of Development of Biopharmaceutical Industry

TYPE: Original research.

TRACK: Economic implications of Impact Innovation Projects.

PURPOSE:

A sectoral system of innovation (SSI) consists of a set of new and established products for a given or emerging demand, characterized by a common knowledge base, and a set of agents carrying out activities and market and non-market interactions through which companies in a sector learn and introduce practices, products, designs and processes that are new to them (Malerba & McKelvey, 2020). An SSI is interactive, to the extent that it involves a system of relationships among assorted players, whose main core factors are universities and research centers, firms and the State. The first three agents conduct basic and applied research, while the State coordinates the system, encouraging and directing it towards its own demands, generating the infrastructure needed to underpin interactions as well as establishing policies and rules tailored to technology development guidelines at the national and regional levels. Agents interact through processes of communication, exchange, cooperation, competition and command, shaped by the formal institutional environment, constituted by rules and regulations.

The system of innovation of the biopharmaceutical sector depends on fragmented knowledge

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

shared out among many different agents, prompting companies to engage in strategic alliances, establishing innovative networks for development of new products (Powell, Packalen, & Whittington, 2012). This paper conducts an analysis of how the biotechnology regulatory framework relates to the public funding and its effectiveness in the initial stages of development of this industry.

DESIGN/METHODOLOGY/APPROACH:

The Brazilian biopharmaceutical industry was studied. Two tiers of analysis of the SSI were considered: the institutional system and the network of interactions among agents. The institutional tier was operationalized by the biotech industry regulatory system; while the agent-interaction tier was operationalized by biotech contractual strategic alliances (Powell et al., 2012). The case study strategy with theory building tactic proposed by Eisenhardt (1989) was applied for studying the relationship between these two tiers. Three specific objectives were set. The first was to study the regulatory aspects that characterize the industry through examination of secondary data, review of the literature and interviews with managers of government bodies and sectoral entities. The second was to characterize strategic alliances by Brazilian biotech companies via interview with their coordinators. Finally, the third was to construct tentative, non-definitive, propositions on the relationship between the constructs of interest using the explanation construction tactic through the categorial cross-analysis technique (Eisenhardt, 1989).

The categories for analysis were defined *a priori* for each analysis tier, based on a review of the literature. For the regulatory system analysis was considered the legislation (intellectual property, price and registration control, taxes and biosecurity) and biotech public policies (government funding; public

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

policies, to support the growth of the biotech industry in its early stages of development, guarantying the effectiveness of public funding.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Due to the methodology adopted, the propositions resulting from this article are plausible rather than definitive. Future works must empirically test their generalization. It also would be interesting to consider the informal-institution dimension.

KEYWORDS (3-5): Sectoral system of innovation, regulatory framework, public policy, strategic alliance, biotechnology industry

REFERENCES

- Eisenhardt, K. M. (1989). Building theory from case study research. *Academy of Management Review*, 14(4), 532-550.
- Gulati, R., & Singh, H. (1998). The Architecture of cooperation. *Administrative Science Quarterly*, 43 (4), 781-814.
- Malerba, F., & McKelvey, M. (2020). Knowledge-intensive innovative entrepreneurship integrating Schumpeter, evolutionary economics, and innovation systems. *Small business economics*, 54(2), 503-522.
- Powell, W. W., Packalen, K., & Whittington, K. (2012). Institutional Genesis. In Padgett, J. F.; Powell, W. W. (Eds.), *The Emergence of Organization and Markets*. United Kingdom: Princeton University Press.
- Schilke, O., & Goerzen, A. (2010). Alliance Management Capability. *Journal of Management*, 36 (5): 1192-1219.

purchases; personnel capacity-building), while for biotech strategic alliances: type (Powell et al., 2012); motive (Gulati & Singh, 1998); and effectiveness, defined as the reach of the initial strategic objective (Schilken & Goerzen, 2010). The theoretical saturation was used to establish the number of cases to be studied.

FINDINGS OR EXPECTED OUTCOMES:

It follows the four main key propositions that emerged from the data analysis.

Proposition 1 (P1). The funding established by public policies for innovative biotechnology projects positively influences the effectiveness of these alliances, allowing access to complementary resources, knowledge, information and better learning curves.

However, biotechnology companies face operational difficulties with the appropriation of intellectual property resulting from innovative activities, delaying the return on investment and increasing the risk of investment in innovation. This problem is related to the authorization time from government bodies such as CONEP and ANVISA to start clinical trials and INPI to issue patents.

Proposition 2 (P2). Regulation moderates the relationship between public policy funding in biotech innovation projects and the effectiveness of this funding.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

The Ministry of Science and Technology (MCT) is responsible for establishing policies for the area of science and technology in Brazil, historically with a focus on training researchers at universities. However,

Proposition 3 (P3). The relationship between public funding for biotech innovation and good quality project proposals is moderated by private investment in R&D, including permanent jobs for people with master's and doctorate degrees on company staff.

When analyzing the support offered to microenterprises, it is necessary to consider the growth phases of biotechnology companies.

Proposition 4 (P4). The relationship between public funding for biotech innovation and its effectiveness is moderated by the tiered scope of funding programs, in terms of the various stages of growth of innovative companies.

ORIGINALITY/VALUE: This work relates two key tiers of the Biotech Sectoral System of Innovation, proposing their relationship in the initial phases of the development of this industry: interaction of agent networks and institutional regulation.

PRACTICAL/SOCIAL IMPLICATIONS: The contribution is to guide regulations, including public

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Walter Bataglia	Brazil	Mackenzie Presbyterian University	batagliaw@gmail.com
Pedro Sanches	Brazil	Mackenzie Presbyterian University	pedro.di.sanches@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: ECO-INNOVATION IN THE CONTEXT OF GREENHOUSE GAS MITIGATION: A SYSTEMATIC LITERATURE REVIEW

TYPE (experience analysis)

TRACK: 1. Impact Innovation Strategies

PURPOSE:

This article proposes an approach to systematize existing knowledge on eco-innovation within the scope of greenhouse gas mitigation, using the methodology of Systematic Literature Review.

DESIGN/METHODOLOGY/APPROACH:

The methodology employed follows the PRISMA criteria and utilizes a sample of 72 articles obtained from the Scopus and Web of Science databases. Data analysis was conducted using Excel and Iramuteq tools. The search strategy for the Systematic Literature Review (SLR) was carefully reviewed and adjusted throughout the process. Although no temporal restrictions were imposed on the platform, a post-data collection verification was carried out to eliminate possible duplications, including those with early publications in the databases.

FINDINGS OR EXPECTED OUTCOMES:

The results obtained reveal that, up to the time of this research, the body of knowledge on eco-innovation related to greenhouse gas mitigation is relatively recent, with its insertion in articles beginning in 2011. The systematic analysis covers approximately 71% of the articles identified up to the date of this study's completion, highlighting a predominance of mixed approaches (quantitative and qualitative) at 37.5%, whose analytical focus is centered on both companies and countries, and 33.33% categorized as quantitative, mainly studies focused on country-level analyses, with 18 articles, especially from 2021 until the date of the research. The portion of articles categorized as theoretical deserves attention due to their minimal representation, at only 6.94%, whose approaches include bibliometrics, systematic literature

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

review, and synthesis of analyses. As for studies of a qualitative nature, there is a significant concentration of publications from 2019 until October 20, 2023. These studies stand out for their emphasis on methodologies such as documentary study, questionnaire application, use of forms, and case study, among other approaches.

ORIGINALITY/VALUE:

The elaboration of this article is justified by the relevance of eco-innovation aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda, established by the United Nations (Khan & Idrees, 2023a). In addition to providing relevant information for the academic community, it serves as a basis for future studies for managers and society in general. It is important to emphasize that issues related to climate change and global warming represent extremely serious challenges that humanity faces (Haller et al., 2023). This scenario becomes particularly relevant for companies committed to greenhouse gas mitigation, as they play a crucial role in reducing environmental impact and promoting benefits for society (Haller et al., 2023; Mavi et al., 2022; Thakker & Bakshi, 2023a; Vaz et al., 2017).

PRACTICAL/SOCIAL IMPLICATIONS:

Governments and corporations worldwide are making significant commitments to achieve net-zero emissions (Thakker & Bakshi, 2023). International instruments such as the Kyoto Protocol, Copenhagen Accord, Paris Agreement, and the European Green Deal have set ambitious goals for reducing greenhouse gas emissions (Khan & Idrees, 2023b). However, it is important to note that the Kyoto Protocol and environmental regulations aimed at slowing CO₂ growth have not yet been met (Fethi & Rahuma, 2020). The United Nations, through the definitions of the Sustainable Development Goals (SDGs) of the 2030 Agenda (Khurshid et al., 2023), addresses in a multidisciplinary manner the central concern associated with estimates of natural resource depletion (Khan & Idrees, 2023b), highlighting the need for eco-innovation in various dimensions: ecological, social, economic, and environmental (Duan & Liu, 2023).

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Future studies are aligned with the need for green innovations, or eco-innovations, to serve as alternatives

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

for reducing emissions and mitigating greenhouse gases. This direction is supported by research, the involvement of companies in transitioning to sustainable energy use, and the role of governmental systems in implementing regulations, agreements, and infrastructure. Adverse impacts on the environment emerge as significant realities, particularly in the context of global warming and climate change.

KEYWORDS

Eco-innovation, Greenhouse gas mitigation, Systematic literature review

REFERENCES

- Duan, D., & Liu, K. (2023). Do financial inclusion, natural resources and green innovation affect the Sustainable Environment in Resource Rich Economies. *RESOURCES POLICY*, 86. <https://doi.org/10.1016/j.resourpol.2023.104190>
- Fethi, S., & Rahuma, A. (2020). The impact of eco-innovation on CO2 emission reductions: Evidence from selected petroleum companies. Em *Structural Change and Economic Dynamics* (Vol. 53, p. 108–115). Elsevier B.V. <https://doi.org/10.1016/j.strueco.2020.01.008>
- Haller, Mirela, Ștefănică, Gina Ionela, B., & Rodica Cristina, B. (2023). Climate neutrality through economic growth, digitalisation, eco-innovation and renewable energy in European countries. Em *Kybernetes*. Emerald Publishing. <https://doi.org/10.1108/K-09-2022-1254>
- Khan, A., & Idrees, A. S. (2023a). Environmental impact of multidimensional eco-innovation adoption: An empirical evidence from European Union. Em *Journal of Environmental Economics and Policy*. Taylor and Francis Ltd. <https://doi.org/10.1080/21606544.2023.2197626>

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Khan, A., & Idrees, A. S. (2023b). Environmental impact of multidimensional eco-innovation adoption:

An empirical evidence from European Union. Em *Journal of Environmental Economics and Policy*. Taylor and Francis Ltd. <https://doi.org/10.1080/21606544.2023.2197626>

Khurshid, A., Khan, K., & Cifuentes-Faura, J. (2023). 2030 Agenda of sustainable transport: Can current progress lead towards carbon neutrality? Em *Transportation Research Part D: Transport and Environment* (Vol. 122). Elsevier Ltd. <https://doi.org/10.1016/j.trd.2023.103869>

Mavi, R., Mavi, N., Saen, R., & Goh, M. (2022). Eco-innovation analysis of OECD countries with common weight analysis in data envelopment analysis. *SUPPLY CHAIN MANAGEMENT-AN INTERNATIONAL JOURNAL*, 27(2), 162–181. <https://doi.org/10.1108/SCM-01-2021-0038>

Thakker, V., & Bakshi, B. R. (2023). Ranking Eco-Innovations to Enable a Sustainable Circular Economy with Net-Zero Emissions. Em *ACS Sustainable Chemistry and Engineering* (Vol. 11, Número 4, p. 1363–1374). American Chemical Society. <https://doi.org/10.1021/acssuschemeng.2c05732>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Ana Cândida Ferreira Vieira	Brazil	UNINOVE UFPB	a.candida@uni9.edu.br
Priscila Rezende da Costa	Brazil	UNINOVE	priscilarc@uni9.pro.br
Camila Naves Arantes	Brazil	UNINOVE	camilanarantes@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

		UFTM	
--	--	------	--

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: OPEN INNOVATION DEVELOPMENT IN THE HEALTH SECTOR: THE CASE OF THE JOINT VENTURE GENESIS

TYPE original research

TRACK: 1

PURPOSE: The purpose of this practical case is to examine how open innovation led to the establishment of a Joint Venture. This case analyzes the partnership between Hospital Israelita Albert Einstein and Grupo Fleury in the genomic field, aiming to enhance service quality, resulting in cost reduction, more efficiency and faster report delivery to patients (GRUPO FLEURY, 2021; HOSPITAL ISRAELITA ALBERT EINSTEIN, 2021).

DESIGN/METHODOLOGY/APPROACH:

To develop this case, an analysis of different documents of Grupo Fleury and Hospital Israelita Albert Einstein was conducted. Additionally, it undertook an interview with Murilo Castro Cervato, CEO and founder of the Startup Varsomics (VARSOMICS, 2023), where it pursued the comprehension of the open innovation phenomenon that resulted in the Joint Venture called Gênisis.

FINDINGS OR EXPECTED OUTCOMES:

The main aspect that resulted in the creation of a Joint Venture is that Grupo Fleury, despite having a robust genomics department, faced challenges in bioinformatics and relied on tools from foreign suppliers, resulting in significant licensing costs. The Varsation, a platform developed by Einstein, addressed this issue by automating laboratory and analytical steps. The solution to these challenges arose from Grupo Fleury expressing interest in using Einstein's bioinformatics platform, resulting in the proposal of a Research and Development (R&D) partnership. Einstein would provide its advanced platform for exam analysis, while Fleury would continue to perform laboratory steps. The collaboration revealed notable

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

synergy between the two institutions: Einstein brought its established expertise in bioinformatics, while Fleury contributed significantly to the automation of laboratory processes.

Recognizing this promising synergy, those involved, including key figures like Director of the Healthcare System at Hospital Albert Einstein, the CEO of Genesis Genomic Analysis, the CEO and founder of Varsomics, and other stakeholders, decided to take it a step further. They approached the boards of both Einstein and Fleury, presenting the idea of a broader partnership that would include genomics as a whole. This strategic move resulted in the decision to proceed with a Joint Venture (JV) formed by merging the genomics departments of both institutions.

This culminated in the creation of the autonomous entity, Genesis, which operates independently in areas such as operations, sequencing, strategic decisions, bioinformatics, Research and Development, and other aspects. Autonomy emerges as a crucial factor in cost reduction, accelerated delivery of reports to patients, and improvement in service quality, incorporating knowledge developed by both Einstein and Fleury. Regarding the financing structure, the creation of Genesis was realized through the merger of financial, material and human resources from both companies involved. However, it is crucial to highlight the differentiation in shareholding, where Fleury holds 55% and Einstein holds 45%. In general, this innovative approach reinforces the importance of strategic collaboration and autonomy to drive substantial advancements in the field of genomics.

With the Joint Venture consolidated, it is expected that in the coming years Genesis not only maintains its leadership in the provision of genomic services but also expands its international presence, exploiting the business opportunities created by the partnership. As Murilo Cervato said one of Gênesis objectives on a large scale is to achieve a generous market share in the genomic field of Latin America in five years. This advancement not only represents a milestone in technological development but also signals the transformative potential of open innovation in the genomics field, opening doors for new developments that can positively impact both developed and developing markets.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

ORIGINALITY/VALUE:

This study is valuable because it is a deep research about the partnership of two big companies in the health sector that started with an open innovation strategy, which includes the exchange of knowledge and experiences, and end up as a joint venture that has its focus in genomic, an area that has a lot of space to develop and growth.

PRACTICAL/SOCIAL IMPLICATIONS:

In the economic field, the proposed initiatives aim to achieve a significant reduction in operational costs and it is worth noting that "Genesis represents around 3% of Fleury's revenue, while in the general clinical analysis market in Brazil, the genomic area accounts for no more than 1% of the financial outcome," (INVEST NEWS, 2023), highlighting that there is space to invest in this area and pointing to a future success of this partnership.

In the social context. This partnership indicates a significant advancement in the supply of high-quality genomic services, benefiting not only the involved institutions but also, and especially, the patients who experience a positive transformation in terms of costs, quality, and efficiency in the delivery of genomic results. Important to emphasize the improvement of quality of genomic diagnostics, providing more precise and personalized treatments for patients.

In the technological field, efforts are focused on the continuous development of the Varsation platform, machine learning integration, and the expansion of the genomic data lake.

Lastly, in the practical-managerial aspect, the implementation of a professional management structure, pricing strategies, and business model strategies is highlighted, ensuring operational efficiency and financial sustainability.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

An interesting field to advance in this research is to interview other stakeholders that were involved in the process of Joint Venture. By interviewing both Einstein and Fleury employees as well as from Genesis itself it would lead to a more complete research.

The limitations of this research is due to having conducted only one interview from an employee that worked previously in the genomic area of Hospital Israelita Albert Einstein. This not only limits the study by information but also limits by having only one company's view.

KEYWORDS (3-5)

Open-innovation, genomic, joint venture, technology.

REFERENCES

GRUPO FLEURY. FLEURY E HOSPITAL ALBERT EINSTEIN CRIAM EMPRESA NA ÁREA DE PESQUISA E TESTES GENÉTICOS. Grupo Fleury, 2022. Disponível em: https://www.linkedin.com/posts/grupo-fleury_fleury-e-hospital-albert-einstein-criam-empresa-activity-6876255025077747712-An0y/?trk=public_profile_like_view&originalSubdomain=pt

INVEST NEWS. FLEURY APOSTA EM EXPANSÃO DO MERCADO DE GENOMA APÓS PARCERIA COM EINSTEIN. Invest News, 2023. Disponível em: <https://investnews.com.br/negocios/fleury-aposta-em-expansao-do-mercado-de-genoma-apos-parceria-com-einstein/#:~:text=No%20Fleury%2C%20o%20setor%20de,no%20primeiro%20trimestre%20de%202022>

VARSONICS. SOBRE NÓS. Varsomics, 2023. Disponível em: <https://varsomics.com/sobre/>.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
------------------	---------	--------------	-------

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Yasmin Bidart Salomone	Brazil	Faculdade Israelita de Ciências da Saúde Albert Einstein	minsalomone@gmail.com
Leandro de Lima Alcântara	Brazil	Faculdade Israelita de Ciências da Saúde Albert Einstein	leandro.alcantara@einstein.br
João Paulo Nascimento da Silva	Brazil	Faculdade Israelita de Ciências da Saúde Albert Einstein FEA USP	joao.pns@einstein.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Optimization process and anticancer biological activity of *pau-d'arco* extract

TYPE: Original research

TRACK: Impact Innovation Strategies / Disruptive Technologies and Sustainable Development / Better Tomorrow: Engagement for Social and Environmental Impact / Collaborative Research and Development

PURPOSE: This study aimed to characterize, optimize the extraction process, and assess the biological activity of inner bark from *Handroanthus impetiginosus* (Mart. ex DC.) Mattos, commonly known as *pau-d'arco*, with a focus on its potential application in the treatment of neoplastic and autoimmune diseases.

DESIGN/METHODOLOGY/APPROACH: The inner bark of *pau-d'arco* (SisGen: ACAB58C) was purchased from the *Casa das Ervas Medicinais do Guerreiro* (Amazonas, Brazil). After the dried and ground process, the plant material (PM) was characterized for particle size, loss on drying, water activity, extractive content, and through high-performance liquid chromatography (HPLC-DAD) to obtain a fingerprint and quantify the phytochemical markers. The extraction process was optimized using Design of Experiments (DoE) and multi-response analysis to evaluate the impact of temperature, solvent concentration (ethanol:water ratio), and extraction duration on variables such as solids content, extraction efficiency, polyphenol content, and antioxidant activity. The optimized extract was subjected to freeze-drying and then used in an in vitro study with human epithelial cells derived from triple-negative breast adenocarcinoma (MDA-MB-231, ATCC, USA) to assess its anticancer activity.

FINDINGS OR EXPECTED OUTCOMES: The characterization results suggest the physical, chemical, and microbiological stability of the PM. The HPLC-DAD fingerprint allowed the identification of veratric acid, a marker of *pau-d'arco* which may be related to several biological activities observed in this plant species. Data analysis showed that the optimal extraction conditions were achieved using 67.5% ethanol, at

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

70 °C for 120 minutes. The preliminary investigations have evidenced the promising anticancer potential of the inner bark extracts against the MDA-MB-231 cell line.

ORIGINALITY/VALUE: Despite the biological potential and the historical use for treating skin cancer and autoimmune diseases, studies focused on standardization with the qualitative and quantitative characterization of their main metabolites, as well as the validation of their biological activity, bioavailability, and toxicity of *pau-d'arco* extracts are relatively scarce, making this an important area of investigation.

PRACTICAL/SOCIAL IMPLICATIONS: The MDA-MB-231 is a human epithelial cell line derived from Triple-Negative Breast Cancer (TNBC), and accounts for about 10-15% of all known cases. However, this kind of cancer does not efficiently respond to hormone therapy or numerous typical chemotherapy drugs, requiring cytotoxic agents that often come with significant side effects. In this context, the optimized *pau-d'arco* extracts show promise as a prominent source for the development of new cancer therapies, offering increased adherence among patients due to their efficacy and potentially reduced side effects.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Despite the results suggesting the potential of these extracts as a possible therapy for TNBC, complementaries studies are required to comprehend the potential for action in other types of cancer and the toxicity for normal cells, as well as to determine the fractions of plant extract and the compound related with the anticancer effect. After the conclusion of these preliminary studies, the extract will be encapsulated in polymeric and lipid nanoparticles.

KEYWORDS: Breast Cancer; Brazilian Biodiversity; Design of Experiments; Dried Extract; Veratric Acid.

REFERENCES

AMERICAN TYPE CULTURE COLLECTION (ATCC, USA). Animal Cell Culture Guide

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

(ACCG-112021-v07), 2022a.

AMERICAN TYPE CULTURE COLLECTION (ATCC, USA). MTT Cell Proliferation Assay (30-1010K), 2011.

AMERICAN TYPE CULTURE COLLECTION (ATCC, USA). Organoid Culture Guide (OCG-092022-v02), 2022c.

BYEON, S. E. *et al.* In vitro and in vivo anti-inflammatory effects of taheebo, a water extract from the inner bark of *Tabebuia avellanedae*. **Journal of ethnopharmacology**, v. 119, n. 1, p. 145-152, 2008.

FARMACOPÉIA BRASILEIRA. 5. ed. Brasília, DF: FIOCRUZ, 2010. v. 1.

HARINI, G. *et al.* Antiproliferative and Apoptotic Effects of pH-Responsive Veratric Acid-Loaded Polydopamine Nanoparticles in Human Triple Negative Breast Cancer Cells. **Chemistry & Biodiversity**, v. 20, n. 6, p. e202201006, 2023.

JIN, Y. *et al.* Development and validation of an analytical method readily applicable for quality control of *Tabebuia impetiginosa* (Taheebo) ethanolic extract. **Journal of AOAC International**, v. 101, n. 3, p. 695-700, 2018.

MUKHERJEE, B.; TELANG, N.; WONG, G. Y. C. Growth inhibition of estrogen receptor positive human breast cancer cells by Taheebo from the inner bark of *Tabebuia avellandae* tree. **International journal of molecular medicine**, v. 24, n. 2, p. 253-260, 2009.

NEWMAN, D. J.; CRAGG, G. M. Natural products as sources of new drugs over the nearly four decades from 01/1981 to 09/2019. **Journal of natural products**, v. 83, n. 3, p. 770-803, 2020.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Gabriela Alberto Gil	Brazil	School of Pharmaceutical Sciences of Ribeirão Preto	gabi.gabriela.gil.10@gmail.com / gabi.gil@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

		of University of São Paulo	
Leticia Kakuda	Brazil	School of Pharmaceutical Sciences of Ribeirão Preto of University of São Paulo	leticia.kakuda@usp.br
Mounika Aare	USA	College of Pharmacy and Pharmaceutical Science of Florida A&M University	aaremounika111@gmail.com
Cleni Mara Marzocchi Machado	Brazil	School of Pharmaceutical Sciences of Ribeirão Preto of University of São Paulo	clenimar@usp.br
Mandip Singh Sachdeva	USA	College of Pharmacy and Pharmaceutical Science of Florida A&M University	mandip.sachdeva@gmail.com
Wanderley Pereira de Oliveira	Brazil	School of Pharmaceutical Sciences of Ribeirão Preto of University of São Paulo	wpoliv@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: The value of using a system for medical-hospital equipment management in public hospitals

TYPE (a. original research, b. research Design or c. practical case / experience analysis)

c. practical case

TRACK:

1. Impact Innovation Strategies - Harnessing Impact Innovation for Social and Economic Progress

PURPOSE:

The purpose of this practical case is to show the value of developing a system for health technology management called GETS (Gerenciamento em Tecnologia da Saúde) in the University of Campinas – Unicamp - and licensing and implementing it in several public health institutions in Brazil.

The goal of Unicamp, was to make available, through a Licensing Agreements for healthcare institutions, a tool that allows clinical engineering centers to have an overview and a particular view of what is happening with their medical and hospital equipment and thus assist them in decision-making when managing technology applied to healthcare. In addition, the idea was to build a unified, nationwide clinical engineering database, containing standardized medical-hospital equipment nomenclature and information, which allows for research with the extraction of relevant information for evaluating technology applied to healthcare (e.g. quality, behavior, distribution).

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

DESIGN/METHODOLOGY/APPROACH:

GETS is a computerized system for managing health technology, encompassing: standardized inventory of dental-medical-hospital equipment, maintenance flows and equipment life-cycle, as well as processes for acquiring equipment, parts, services, contracts and other related flows, with historical and real-time monitoring of the equipment life-cycle, in addition to the generation of classic and new clinical engineering indicators.

The Center for Biomedical Engineering (CEB) from the University of Campinas (Unicamp) started developing the GETS system in the beginning of the years 2000, but the system only started operating in 2010. The technology is the result of projects funded by the Ministry of Science and Technology (through FINEP - Brazilian Financier of Studies and Projects) and The Ministry of Health (through FNS - Brazilian National Health Fund - and FINEP). In 2012, Unicamp Innovation Agency (Inova), registered the Computer Program GETS in the Brazilian National Institute of Industrial Property – INPI and the research group started its first trial implementation in a public hospital in Campinas, Mario Gatti Hospital. Finally, in 2013, after negotiation of Inova, Unicamp signed the first licensing agreement of the system.

In the years to follow, the system was licensed to other hospitals, but the biggest turning point, was the licensing of GETS to 37 federal university public hospitals managed by EBSEHR in 2020. The Brazilian Hospital Services Company (EBSERH - Empresa Brasileira de Serviços Hospitalares) is a public company governed by private law, linked to the Ministry of Education, with the purpose of providing medical-hospital support services to the community, within the scope of the SUS (Brazilian Unified Health System).

The licensing model of GETS for public health institutions is free of charge. However, it is also necessary that the health institution establish an agreement for the implementation of the system and training of the clinical engineers for the correct and complete use of the System.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Unicamp's GETS research group maintains the centralized development and management of the system, providing a web access (login) to each licensed health institution. The source code of the software is not available to licensees and IP is maintained at Unicamp. The software has a centralized medical-hospital equipments database, which is used by the research group to carry out research.

FINDINGS OR EXPECTED OUTCOMES:

Up to this time, Unicamp has formalized 51 licenses of the GETS system, from which 46 are currently active. EBSEH federal university public hospitals carried out 38 of these licenses. Additionally, the GETS system has more than 10 thousand users from 46 Clinical Engineering Centers, covering a total of 186 Health Units in 24 Brazilian States. The implementation of the system in those Health Units enabled the creation of a database with more than 120 thousand registered medical equipments (with standardized nomenclature and information).

Furthermore, the creation of the medical-hospital equipment database enables research using modern data techniques for the classification of the quality of the equipments, maintenance forecast, crash forecast, advance forecast of parts that need to be purchased for maintenance, equipment availability and distribution, etc. In addition, the implementation of GETS in several public health units allows for consistent training of clinical engineers.

ORIGINALITY/VALUE:

GETS is a unique management system, with standardized equipment nomenclature, workflows and information, which makes it a great source for data mining for clinical engineering and health technology studies, and research based on medical and hospital equipment database. It is a centralized tool for managing a hospital's equipment based on impartial data about the equipments.

Currently, there is not a similar system which is implemented in several hospitals allowing effective

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

network management with security and robustness in equipment information. It can provide a vast overview of the medical equipment base of Brazilian public hospitals.

PRACTICAL/SOCIAL IMPLICATIONS:

The GETS system is free for public Health Institutions. Moreover, the implementation of GETS in several public hospitals, makes it useful to assist the government in decision making based on available information such as which equipment purchased by the government has high repair rate, which places need certain equipment more than others or which institutions have taken better care of their equipment. The system can help the government to reduce the frequency of equipment breakdowns and consequently save in equipment maintenance.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Currently, there are new public health institutions that are interested in implementing the GETS System and Inova Unicamp is constantly negotiating the licensing agreements. In the future, Unicamp wants to expand the licensing agreements of GETS to private institutions, in which case, the licensing model will have to be developed. One of the limitations for the System GETS expansion is the lack of resource for infrastructure and personnel.

The research group is interested in developing research using modern technologies for data analytics and data mining applied to the health equipments database. They also want to start working on the implementation of data anonymization in real time in large scale.

KEYWORDS (3-5): health technology management, medical equipment database, equipment management

REFERENCES

Unicamp – University of Campinas <www.unicamp.br>. Access in: 30/03/2024.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Inova – Innovation Agency of the University of Campinas <<https://www.inova.unicamp.br/>>. Access in: 30/03/2024.

FINEP - Brazilian Financier of Studies and Projects <<http://www.finep.gov.br/>>. Access in: 30/03/2024.

INPI – Brazilian National Institute of Industrial Property <<https://www.gov.br/inpi/pt-br>>. Access in: 30/03/2024.

FNS - Brazilian National health fund <<https://portalfns.saude.gov.br/>>. Access in: 30/03/2024.

EBSERH - Empresa Brasileira de Serviços Hospitalares (Brazilian Hospital Services Company)
<<https://www.gov.br/ebserh/pt-br>>. Access in: 30/03/2024.

SUS - Unified Health System <<https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z/s/sus>>. Access in: 30/03/2024.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
José Wilson Magalhães Bassani	Brazil	Unicamp	bassani@unicamp.br
Ana Cristina Bottura Eboli	Brazil	Unicamp	anabe@unicamp.br
Beatriz Hargrave Gonçalves da Silva	Brazil	Inova Unicamp	beatriz.silva@inova.unicamp.br
Iara Regina da Silva	Brazil	Inova Unicamp	iara.ferreira@inova.unicamp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Ferreira			amp.br
----------	--	--	--------

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Curar Saúde: Breaking down obstacles in health communication and promotion

TYPE: Research Design

TRACK: Impact Innovation Strategies

PURPOSE: Our goal is to provide effective health literacy by establishing a gamified and scientifically validated social network with a health-centric focus, addressing challenges related to cultural diversity, health literacy, and social validation.

DESIGN/METHODOLOGY/APPROACH: Curar Saúde is an inclusive social network that welcomes users to share health tips and content. All submissions undergo rigorous professional review for scientific validation. These validated contents are then transformed into interactive challenges featuring quizzes, which users can freely access. By participating, users can accumulate points that are redeemable for low-cost health products. Our approach integrates proven strategies for fostering positive behavior contagion in health, emphasizing the identification and promotion of positive deviants (i.e. good influencers despite challenging environments). The platform uses these immediate gratification strategies and leverages the power of social influence, providing social support mechanisms, and fostering a sense of social identity and belonging that disseminates healthy behaviors.

FINDINGS OR EXPECTED OUTCOMES:

The platform is available at www.curarsaude.com.br. We expect to organically establish a free, diverse and reliable source of information in health for society, that can redefine gold standards in effective health communication for better health behavior. We also plan to partner with the healthcare industry and governments to promote large scale health literacy and healthcare access.

ORIGINALITY/VALUE:

The originality of our strategy lies in the holistic and innovative approach that prioritizes both the scientific foundations of health promotion and the user-centric aspects of engagement. This results in a platform that is not only effective but also captivating and adaptable to a wide range of user needs, ensuring accessibility and comprehension of diverse health information.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Curar Saúde delivers value to a variety of stakeholders:

- Users gain access to a reliable information source that is free from misleading content and is provided by individuals who share similar realities, cultures and values.
- Health communicators, influencers, health professionals, and institutional health services have their content independently certified in a reliable environment, free from unfair competition by quackery.
- Health supply industries, contributing with donation of low-cost healthcare products like personal health and hygiene items, can amplify the social impact of their donations through knowledge aggregation
- Healthcare providers, including health insurances and healthcare plans, can provide health literacy, achieving a previously proven high return on investment.
- Governments can promote incentivized awareness campaigns in public health.

PRACTICAL/SOCIAL IMPLICATIONS:

In Brazil alone, pre-pandemic data indicated approximately 700,000 preventable deaths annually. According to the World Health Organization, promoting health literacy stands out as a crucial approach to mitigate unnecessary suffering, prevent deaths, and reduce healthcare costs. Despite the widespread search for health information online, it becomes more prevalent during illness and is less driven by the desire for proactive health promotion, especially among those with limited resources.

Encouraging the learning process through immediate rewards can potentially prevent future morbidity and mortality. We currently face an infodemic characterized by abundant misinformation and disinformation, but even with reliable information sources, challenges such as formal language, low literacy levels, and cultural barriers hinder effective health communication. Curar aims to offer information that is not only trustworthy and incentivized but also carries the social proof unique to peer endorsement.

The impact of immediate rewards is noteworthy. For instance, approximately 1 in 10 Brazilians lack toothbrushes at home. With this strategy, individuals not only receive oral hygiene products but also benefit from community members sharing proper teeth-brushing techniques, fostering a holistic approach to health education.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Despite the scientifically validated foundations of this approach, our intention extends beyond merely establishing a naturally evolving health-centric social network. We are committed to evaluating its impact on health behavior and outcomes through randomized controlled trials across a spectrum of health conditions. These research initiatives are being structured for potential inclusion in grant proposals at Hospital das Clínicas - University of São Paulo, the largest public hospital in Latin America, and at Hospital Sírio Libanês, a high-quality philanthropic private hospital in São Paulo.

While the benefits of this initiative are evident across all social and economic strata, our primary focus is on users in classes C, D, and E. Particularly for the latter tiers, we anticipate a notable portion of digitally excluded individuals, potentially limiting our impact.

KEYWORDS (3-5): health literacy, social network, gamification, behaviour economics

REFERENCES:

Kickbusch I, Pelikan JM, Apfel F, Tsouros AD. Health literacy: the solid facts [Internet]. World Health Organization. Regional Office for Europe; 2013 [cited 2023 Jul 28]. vi, 73 p. Available from: <https://apps.who.int/iris/handle/10665/326432>

Promoting health in the SDGs: report on the 9th Global conference for health promotion, Shanghai, China, 21–24 November 2016: all for health, health for all [Internet]. [cited 2023 Jul 28]. Available from: <https://www.who.int/publications-detailredirect/promoting-health-in-the-sdgs>

Kristine Sørensen GA. Health literacy around the world: policy approaches to wellbeing through knowledge and empowerment. The Economist Intelligence Unit Limited 2021 [Internet]. 2021 Jul; Available from: https://impact.economist.com/perspectives/sites/default/files/lon_-_es_-_health_literacy_paper_v8_0.pdf

The Social and Economic Return of Health Literacy Interventions in the WHO EURO Region.

Improving health literacy [Internet]. [cited 2023 Jul 28]. Available from: <https://www.who.int/activities/improving-health-literacy>

Centers for Disease Control and Prevention [Internet]. 2023 [cited 2023 Jul 28]. Health Literacy Research and Best Practices. Available from: <https://www.cdc.gov/healthliteracy/researchevaluate/comm-strategies.html>

Triatmaja NT, Mahmudiono T, Mamun AA, Abdullah NA. Effectiveness of Positive Deviance Approach to Reduce Malnutrition among under Five Children: A Systematic

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Review and Meta-Analysis of Interventional Studies. *Nutrients*. 2023 Apr 19;15(8):1961.

Banerjee AV, Duflo E, Glennerster R, Kothari D. Improving immunisation coverage in rural India: clustered randomised controlled evaluation of immunisation campaigns with and without incentives. *BMJ*. 2010 May 17;340:c2220.

Greene JC, Haun JN, French DD, Chambers SL, Roswell RH. Reduced Hospitalizations, Emergency Room Visits, and Costs Associated with a Web-Based Health Literacy, Aligned Incentive Intervention: Mixed Methods Study. *J Med Internet Res*. 2019 Oct 17;21(10):e14772.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Raquel Ajob Moyses	Brazil	Curar Saúde; University of São Paulo Medical School	curar@curarsaude.com.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Deep Techs and society's great challenges: the case of Moderna in facing COVID-19.

TYPE: c. practical case/experience analysis.

TRACK: 1. Impact Innovation Strategies

PURPOSE: This is a teaching case that was developed for the Innovation Management discipline, more specifically for a class on deeptechs. Deeptech ventures are those whose innovative solutions are based on science and technology. These ventures operate within ecosystems, defined as an environment that brings together a set of interdependent and complementary actors (companies, governments, startups, NGOs, suppliers, customers, universities) aimed at generating a value proposition.

DESIGN/METHODOLOGY/APPROACH: This is qualitative research that uses the teaching case method to address the journey of Modern Deep Tech. We used secondary data collection to address the research phenomenon studied. This class aims to work with students on the concepts of ecosystem, deeptech ventures, uncertainties, and innovation management.

FINDINGS OR EXPECTED OUTCOMES: The research demonstrates the prominent role of scientific entrepreneurship and entrepreneurial universities in training scientists who become entrepreneurs and found corporations capable of facing major social challenges. An expected result is that our teaching case about innovation and scientific entrepreneurship will be a tool for teachers to disseminate how disruptive businesses evolve until they reach the innovation ecosystem. Furthermore, we distinguish three important phases for deep tech startups. In the first phase, deep tech ventures are a possible agent for driving solutions to society's major challenges, combining science, technology, business, and scaling solutions. The second phase is the innovation phase, where science becomes real, and becomes a product or service. At this stage, the scientist structures his business model and positions himself within the entrepreneurial ecosystem, through an open company and a CNPJ that identifies him. In the third phase, the entrepreneur becomes a businessman and needs new capabilities to lead the scaling of his business. In this scenario, the entrepreneur connects with large companies and positions himself in the innovation ecosystem.

ORIGINALITY/VALUE: This study seeks to understand how deep tech startups face society's greatest challenges. Using the Moderna case study, we open the possibility of a deeper exploration of each phase that deep tech startups face in their life cycle.

PRACTICAL/SOCIAL IMPLICATIONS: Deeptech ventures present themselves as a possible agent for driving solutions to society's major challenges, combining science, technology, business and scaling

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

solutions. This teaching case addresses the development of a vaccine to combat COVID-19 amid a global pandemic where millions of people around the world were threatened and scientists were called to act quickly to develop a solution based on science and technology that was viable and scalable in the shortest possible time to avoid a global tragedy.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Our study was limited to studying a success case and proposing a class for the innovation lesson. Future studies can deeply understand how startups adapt in each phase and in each ecosystem where they are located, exploring new cases, or applying different methodologies to the one applied in this research. These strategies can resolve the limitation of the scope of this work.

KEYWORDS (3-5) Deep Tech. Innovation. Entrepreneurship. Teaching Case

REFERENCES

- Anderson, S. Derrick Rossi, the stem cell scientist who co-founded Moderna, receives honorary degree. Disponível em: <https://www.utoronto.ca/news/derrick-rossi-stem-cell-scientist-who-co-founded-moderna-receives-honorary-degree>
- Autio, E., & Thomas, L. D. (2021). Researching ecosystems in innovation contexts. *Innovation & Management Review*, 19(1), 12–25.
- Basilio, O., Murray, F., & Frolund, L. (2022). What is “Deep Tech” and what are Deep Tech Ventures? Working Paper. MIT Global Programs.
- Cohen, J. (2020). Absolutely remarkable': No one who got Moderna's vaccine in trial developed severe COVID-19. Disponível em: <https://www.science.org/content/article/absolutely-remarkable-no-one-who-got-modernas-vaccine-trial-developed-severe-covid-19>
- Conrad, K. (2021). Stephen Hoge, MD '03: Turns out, designing a COVID vaccine was easy. UCSF Magazine. Disponível em <https://alumni.ucsf.edu/stories/stephen-hoge>
- Cooper, R. G. (1990). Stage-gate systems: a new tool for managing new products. *Business horizons*, 33(3), 44-54.
- Cooper, R. G. (2006). The seven principles of the latest Stage-Gate® method add up to a streamlined, new-product idea-to-launch process. Stage-Gate International.
- Cooper, R. G. (2010). The stage-gate product innovation system: from idea to launch. *Encyclopedia of Technology and Innovation Management*. West Sussex, UK: John Wiley & Sons Ltd, 157-167.
- de Vasconcelos Gomes, L. A., Flechas, X. A., Facin, A. L. F., & Borini, F. M. (2021). Ecosystem management: Past achievements and future promises. *Technological Forecasting and Social Change*, 171, 120950.
- Dolgin E., (2021) Nature. The tangled history of mRNA vaccines, Disponível em:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

<https://www.nature.com/articles/d41586-021-02483-w>

Dolgin, E. (2015). Business: The billion-dollar biotech. Disponível em:

<https://www.nature.com/articles/522026a>

Eckhart, J. T. and Shane, S. A. (2003). 'Opportunities and entrepreneurship'. Journal of Management, 29, 333–49.

Foss, N. J. and Klein, P. G. (2012). Organizing Entrepreneurial Judgment: A New Theory of the Firm. Cambridge: Cambridge University Press.

Gomes, L. A. D. V., Flechas, A., Facin, A. L. F., Borini, F. M., Stefani, B., & Leal, L. F. (2023).

Entrepreneurial judgment governance adaptation for digital transformation in established firms. Strategic Entrepreneurship Journal. 1–26. <https://doi.org/10.1002/sej.1490>

Gomes, L. A., Facin, A. L. F., Leal, L. F., de Senzi Zancul, E., Salerno, M. S., & Borini, F. M. (2022). The emergence of the ecosystem management function in B2B firms. Industrial Marketing Management, 102, 465–487.

Gormley, B. (2013). Moderna Therapeutics Strikes \$420M Deal With AstraZeneca. Disponível em:

<https://www.wsj.com/articles/DJFVW00020130321e93lpqxz1>

Hitt, M. A., Ireland, R. D., & Hoskisson, R. E. (2022). Administração estratégica: competitividade e globalização-conceitos. Cengage Learning.

HSCI-Harvard Stem Cell Institute (2018). HSCI supported research leads to new class of therapeutics. Disponível em

<https://hsci.harvard.edu/news/hsci-supports-high-risk-research-leads-new-class-therapeutics>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Gabriel Medeiros	Brazil	Universidade de São Paulo	gabriel.demedeiros6@usp.br
Erika Oliveira	Brazil	Universidade de São Paulo	erikasilvadeoliveira02@usp.br
Fábio Santos	Brazil	Universidade de São Paulo	fjsantos@usp.br
Silvia Tommaso	Brazil	Universidade de São Paulo	silvia.tommaso@faculdadefia.edu.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

João Silvia	Brazil	Universidade de São Paulo	jpnsilvas@gmail.com
-------------	--------	------------------------------	---------------------

02

Talent Development and Collaboration

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Diversity and inclusion as a counterpoint to Scientific Management and the efficiency paradigm

Guilherme Rhinow

People are living in a world in which change is occurring at an unprecedented speed. The generation of new knowledge has never been faster, which also has an inexorable effect on its obsolescence. In the context of organizations, the pressure for results demands an incessant search for new sources of competitive advantages to face the pressures that are increasingly intense (Hamel & Zanini, 2020; Charan, Barton & Carey, 2018).

This transformation is leveraged by technological development that creates new channels for obtaining information and people are connected regardless of the geography in which they are located. The challenges recently imposed by the pandemics, with the confinement of people in their homes, had a significantly lower impact on the performance of organizations, which were able to maintain their activities and levels of operation to serve their customers and other stakeholders without significant disruptions. At the same time, proposals were made on a "reimagined work" adapted to new social and demographic trends, generating research and new elements for reflection on management practices in companies (Ernst & Young, 2022).

In addition to technological development, it is important to highlight the impact of globalization on the proximity of people and the minimization of geographical borders. Globalization – either financial, commercial or productive – has gradually reshaped the relationship established between countries and companies with the reduction of limits for the development and commercialization of products. The redefinition of these boundaries and the removal of barriers create conditions for greater standardization and unification of practices and behaviors, as well as the approximation of different cultures. This standardization is reinforced by the efficiency paradigm advocated in the antecedents of organizational theory with Frederick Taylor in the late nineteenth and early twentieth centuries, with the proposition of a scientific method to obtain the best cost and benefits of production systems (Taylor, 2009).

This management model focused on the efficiency paradigm has permeated the evolution of organizational sciences and provided effective responses for companies to lead with emerging challenges for a long time. Several classic management concepts such as strategy, culture, and organizations have been created and developed based on this paradigm.

The *strategy* promotes the differentiation of companies in competitive environments for their survival and prosperity. Its definition and subsequent dissemination among people make it possible for teams to engage with the best way to perform activities and obtain competitiveness according to the organization's core competencies. (Hamel & Prahalad, 2005; Kaplan & Norton, 2001; Mintzberg, 1994). The perpetuity of groups and organizations underlies the concept of *culture*, the set of basic assumptions that a

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

group has invented, discovered, or developed by learning how to deal with the problems and that have worked well enough to be considered valid and taught to new members who are part of this community. The behaviors validated by this trajectory of the group create the correct pattern of action within that social system and are continuously reinforced (Schein, 2016; Cameron and Quinn, 2011). Finally, the concept of *organization* that unites individuals around a common goal based on the classical principles of hierarchy, bureaucracy and control proposed by Weber (1947), one of the classic references in the proposition of organizational sciences. Current application of these ideas in organizations contextualizes the articulation of people around common challenges by highlighting the importance of combining individual efforts as the most effective way to achieve collective purpose.

The constant pressures in an environment full of competition have demonstrated to organizations the need to review or, at least, complement the current paradigm of efficiency. The ambiguity resulting from increasingly uncertain environments created a context for the emergence of new concepts such as organizational learning, resulting from the expansion of research on individual learning and the proposition of new approaches for organizations placed as exponential (Ismail, Malone & Geest, 2014), which challenged the current management assumptions. In this scenario, concepts of learning, innovation, diversity and inclusion have been identified as possible sources of competitive advantages for companies.

Fraga et al. (2022) also identify the increased relevance of diversity and inclusion concepts in organizational, labor relations, and people management studies with theoretical and practical implications on prejudice, inequality, and differences, but also on increased productivity, impact on results, and increased competitiveness. This definition reinforces the importance of inserting people's subjectivity and uniqueness in the assumptions of organizational management.

The challenge remains as to how to deal with subjectivity as a new element and what is its impact on the formulation of the current management paradigm. This becomes relevant since the diversity and inclusion movements recently inserted in companies contemplate this dimension and invite people to bring their singularity to the work environment. Ferdman (1995) presents the concept of singularity characterized by the differentiation of the individual in the collective group to which he belongs. Allied to this differentiation, the notion of belonging according to Lee (2022) becomes fundamental since it focuses on how professionals feel and bring their emotions to the work context.

The revision of this paradigm of efficiency and insertion of subjectivity is challenging. Guattari (2012) highlights this challenge by identifying the difficulties in finding devices for the production of subjectivity. Among these devices, diversity and inclusion practices within organizations were designed with the objective of enabling people's uniqueness and creating a space for the advent of subjectivity.

As companies introduce and evolve with diversity and inclusion approaches, main outcomes are related to formation of employee resources groups to deal with

minorities or cope with local legislation regulations on quota challenges. Minor impacts to singularity or people uniqueness and consequent innovation therefore. Faced with the massive adoption of diversity and inclusion approaches across different industries, there is the challenge of understanding, through data collection and analysis in organizations, whether they are managing to deal with the singularity of people in the work environment or just reinforcing the efficiency paradigm which was learned over the years.

Bibliography

Cameron, K. S., & Quinn, R. E., *Diagnosing and changing organizational culture based on the competing values framework*, Jossey-Bass, San Francisco, 2011

Charan, R., Barton, D. & Carey, D., *Talent Wins*, Boston, Harvard Business Review Press, 2018

Ernst & Young, *Trabalho Reimaginado*, in Relatório de Pesquisa Ernst & Young, São Paulo, 2022

Ferdman, B. M., Cultural Identity and diversity in organizations: bridging the gap between group differences and individual uniqueness in Chemers, M. M., *Diversity in organizations: new perspectives for a changing workplace*, London, Sage Publications, 1995

Fraga, A. M. et alii, *As diversidades da diversidade: revisão sistemática da produção científica brasileira sobre diversidade na administração (2001 – 2019)* in Cadernos FGV Ebape, 2022

Guattari, F., *As três ecologias*, Campinas, Editora Papirus, 21ª edição, 2012

Hamel, G. & Prahalad, C. K., *Competing for the future*, Boston, Harvard Business School Press, 2005

Hamel, G. & Zanini, *Humanocracy: creating organizations as amazing as their people inside them*, Boston, Harvard Business School Press, 2020

Hogan, R. & Curphy, G., *The rocket model: practical advice for building high performing teams*, Oklahoma, Hogan Press, 2012

Ismail, S; Malone, M & Geest Y., *Exponential Organizations: Why New Organizations Are Ten Times Better, Faster, and Cheaper Than Yours (and What to Do about It)*, New York City, Diversion Books, 2014

Lee, S., *Why belonging is key to building the new workforce*, MIT Sloan Management Review, edição de 13 de junho de 2022

Mintzberg, H., *The raise and fall of strategic planning: reconceiving roles for planning, plans, planners*, New York, The Free Press, 1994

Schein, E., *Organizational culture and leadership*, San Francisco, Jossey Bass, 2016

Taylor, F. *The principles of scientific management*, Memphis, General Books LLC, 2009

Weber, M., *The theory of social and economic reform.*, New York, Free Press, 1947

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference 2024

—

TITLE: Evaluating Learning Factories through the Lens of the Triple Helix Model: A Case Study of Fábrica do Futuro

TYPE (c. practical case / experience analysis)

strongly supported by the participation of private companies

TRACK: (2. Talent Development and Collaboration or 5. Triple Helix Model in Practice around the world)

PURPOSE: This work aims to assess the Learning Factory concept and practical implementations considering the perspective of the Triple Helix Model. Learning Factories are facilities that emulate a real manufacturing environment to support technical education, technology development, and demonstration. Learning Factories are typically implemented in universities, following public policy incentives and

DESIGN/METHODOLOGY/APPROACH: The research design includes a systematic literature review and the Fábrica do Futuro Learning Factory case study. Fábrica do Futuro is led by the University of São Paulo School of Engineering (Escola Politécnica). Its implementation was driven by public policy to foster the advancement of Industry 4.0 in Brazil. A consortium of private companies supported the implementation (Leal et al., 2020; Zancul et al., 2023). The case study explores the Fábrica do Futuro applications in education, technology development, and startup generation.

FINDINGS OR EXPECTED OUTCOMES: The main result is the discussion of the Learning Factory concepts through the lens of the Triple Helix Model. A detailed case study at Fábrica do Futuro provides insights into a practical application.

al.

ORIGINALITY/VALUE: The Learning Factory construct is well-defined in the literature (Abele et al., 2019, 2017), but only recently it has started to be analyzed in relation to innovation management theories. A previous study related Learning Factories to innovation ecosystems (Zancul et al., 2022). This study

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

represents a step forward in discussing the role and limitations of Learning Factories from the innovation management perspective.

PRACTICAL/SOCIAL IMPLICATIONS: Currently, we see an expansion of Learning Factories in universities worldwide. This movement is driven by the trend toward practical engineering education and Industry 4.0 deployment. In this context, understanding the Learning Factories considering the innovation management background may provide relevant insights to inform policymakers, researchers, and educators on the potential and limitations of Learning Factories.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Further research may replicate the analysis in other Learning Factories worldwide. The International Association of Learning Factories (IALF) has been expanding and may provide other cases for analysis. The following works should also discuss the Learning Factories' effectiveness in improving education and manufacturing technology dissemination.

KEYWORDS (3-5): Learning Factory; Industry 4.0; Advanced Manufacturing

REFERENCES

2017;66:803

Abele E, Chryssolouris G, Sihn W, Metternich J, ElMaraghy H, Seliger G, et al. Learning factories for future oriented research and education in manufacturing. CIRP Ann Manuf Technol –26. <https://doi.org/10.1016/j.cirp.2017.05.005>.

Abele E, Metternich J, Tisch M. Learning Factories: Concepts, Guidelines, Best-Practice Examples. Cham: Springer; 2019.

focused on Industry 4.0

Leal LF, Fleury A, Zancul E Starting up a Learning Factory

Procedia Manuf

2020;45:436–41. <https://doi.org/https://doi.org/10.1016/j.promfg.2020.04.049>.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

represents a step forward in discussing the role and limitations of Learning Factories from the innovation J 2022. <https://doi.org/10.2139/ssrn.4074151>.

B
Zancul E, Kras da Silveira D, Schützer K. Learning Factory Application in Project-Based Courses: Framework and Results Assessment. SSRN Electron J 2023. <https://doi.org/10.2139/ssrn.4470474>.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Renan Esposito Vieira	Brazil	USP	revieira@usp.br
Thayla Tavares de Sousa Zomer	Brazil	USP	thayla.zomer@usp.br
Eduardo Zancul	Brazil	USP	ezancul@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Forging Pathways to Success: Leveraging Triple Helix Collaboration to Tackle Bacterial Resistance Challenges

TYPE: Original Research

TRACK: Collaboration models between academia, industry, and government

PURPOSE: The interconnectedness of global public health crises extends beyond healthcare sectors, directly impacting societal well-being and the economies of nations worldwide ([WHO, 2015](#)). The alarming escalation of infections attributed to resistant bacteria presents an urgent global public health crisis with profound potential for economic and social upheaval on a global scale. Recognizing this threat, the World Economic Forum underscored in 2013 the necessity for public policy interventions to incentivize industry engagement in the development of antibiotics and novel treatments to curb the surge in resistance ([World Economic Forum, 2013](#)). In 2014, economist Jim O'Neill estimated that 700 thousand deaths were caused by antimicrobial-resistant (AMR) bacteria and projected that bacterial resistance could lead to 50 million deaths worldwide by 2050 ([Jim O'Neill, 2016](#)). However, utilizing data from 2019, estimates revealed that nearly 4.95 million deaths were associated to resistant bacterial infections, with 1.27 million directly attributed to bacterial infections resistant to antimicrobials ([Antimicrobial Resistance Collaborators, 2022](#)).

The convening of world leaders to develop actions for containing resistance worldwide has spurred different actions across various sectors of society. The development of new antimicrobials has always been associated with the university-industry-government integration, as observed with the innovative process of Penicillin during World War II. The Triple Helix model in the 1990s, pioneered by Henry Etzkowitz and Loet Leydesdorff, marked a significant milestone in fostering collaboration among three key sectors: university, government, and industry ([Etzkowitz & Leydesdorff, 1998](#)). This collaborative framework laid the

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

groundwork for nurturing an environment conducive to innovation and economic development. While the overarching principles of the Triple Helix model apply universally, the precise roles played by each sector can vary significantly depending on national context and local circumstances. The dynamic landscape of bacterial resistance, coupled with its rapid adaptation to existing innovations, fuels ongoing debates across political, business, and scientific domains. Within this complex scenario, the roles of actors in innovation formation evolve continuously.

Our work seeks to evaluate the historical trajectory of innovative approaches to combat resistance while also forecasting the future of innovation within the sector. By examining past successes and challenges, we aim to inform strategic decision-making and foster collaborative efforts among academia, government, and industry to address the pressing issue of bacterial resistance effectively.

DESIGN/METHODOLOGY/APPROACH: The work was carried out through historical analysis, utilizing historical documents to establish the correlation between the Triple Helix sectors (government, industry, and university) and the historical understanding of this relationship. Identification of innovation within the scientific sector (discovery of new molecules, developed diagnostic tests), in the administrative sector (new management strategies in combating resistance), and in political sectors (governmental direction in combating resistance). Analysis of the principles of collaboration among university, government, and industry and their application in the development of innovative solutions to combat bacterial resistance. Analysis of successful cases, challenges faced, and lessons learned in this collaborative approach. Interviews with experts in the field, healthcare professionals, academic researchers, representatives of the pharmaceutical industry, and policymakers to gain insights into current practices and future perspectives in combating bacterial resistance. Based on the identified trends and future projections, we will conduct a prospective analysis of the scenario of combating bacterial resistance. Exploring emerging opportunities, potential challenges, and possible directions for future innovations and health policies.

FINDINGS OR EXPECTED OUTCOMES: The preliminary data highlights the significant role of

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

innovative processes in the fight against bacterial resistance. For instance, the initial discovery of penicillin, subsequent clinical studies conducted within academic institutions, rapid industrial-scale production by the pharmaceutical industry, and government oversight and application were pivotal in saving lives during World War II. However, this relationship has evolved over time, with changes in the roles of various actors. Presently, there are shifts in the production process formation, with the emergence of spin-offs contributing to innovation and the integration of innovative practices within the production sector.

ORIGINALITY/VALUE: The summary presents significant originality in addressing the relationship between innovative processes and the fight against bacterial resistance from the perspective of collaboration between academia, industry and government, as recommended by the Triple Helix model

PRACTICAL/SOCIAL IMPLICATIONS: The social implication of this summary is significant, as it highlights the importance of collaboration between different sectors of society – academia, industry, and government – in the fight against bacterial resistance. By recognizing the central role of these actors in promoting innovation and developing effective solutions, the document highlights the need for an integrated and collaborative approach to addressing complex public health challenges.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Lack of quantitative data or statistical analyses may limit the summary's ability to provide a comprehensive assessment of the impact of Triple Helix collaborative strategies in combating bacterial resistance.

KEYWORDS (3-5): Bacterial resistance; Triple Helix; Collaborative Innovation

REFERENCES:

Antimicrobial Resistance Collaborators. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *Lancet*. 2022 Feb 12;399(10325):629–655. doi: 10.1016/S0140-6736(21)02724-0. Epub 2022 Jan 19. Erratum in: *Lancet*. 2022 Oct 1;400(10358):1102. PMID: 35065702; PMCID: PMC8841637.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Etzkowitz, H., & Leydesdorff, L. (1998). A Triple Helix of University–Industry–Government Relations: Introduction. *Industry and Higher Education*, 12(4), 197–201.

Jim O'Neill; Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations *The Review on Antimicrobial Resistance* Chaired by Jim O'Neill December 2016.

World Economic Forum (2013). *Global Risks, Eighth Edition* Ed. 2013. – 33. Acessado online em: http://www3.weforum.org/docs/WEF_GlobalRisks_Report_2013.pdf (acessado em 12/01/20).

WHO publishes list of bacteria for which new antibiotics are urgently needed. Disponível em: <https://www.who.int/news/item/27-02-2017-who-publishes-list-of-bacteria-for-which-new-antibiotics-are-urgently-needed>. Accessed for the last time on 01/03/2021.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
André Valencio	Brazil	UNIFESP	valencio.andre@unifesp.br
Fernanda Fernandes Santos	Brazil	UNIFESP	ff.santos@unifesp.br
Aghata Cardoso da Silva Ribeiro	Brazil	UNIFESP	aghata.cardoso@unifesp.br
Alex Yuri Simões Sato	Brazil	UNIFESP	alex.yuri@unifesp.br
Arnaldo Colombo	Brazil	UNIFESP	arnaldo.colombo@unifesp.br
Moacir M. Oliveira Jr	Brazil	USP	mirandaoliveira@usp.br
Ana C. Gales	Brazil	UNIFESP	ana.gales@unifesp.br



XXII Triple Helix Conference – 2024

PGI: Training Program aimed at Catalyzing Innovation and Entrepreneurship within the USP Ecosystem through AUSPIN Initiatives

TYPE: c. Practical case / Experience analysis

TRACK: 2. Talent Development and Collaboration

PURPOSE:

The Academic Management of Innovation and Entrepreneurship Program (PGI) at the University of São Paulo (USP) supported by the USP Innovation Agency (AUSPIN) was created to train professionals to serve as academic managers for innovation and entrepreneurship in research and development projects. The main goal is to improve management practices, streamline processes, increase international competitiveness, and foster a culture of entrepreneurship and innovation within the university.

DESIGN/METHODOLOGY/APPROACH:

PGI managers will be trained through a hands-on model, by collaborating with AUSPIN in supporting the University's champion projects, with an emphasis on one or more PGI thematic axes, which are: i. intellectual property analysis, management and strategy; ii. technology transfer analysis, management, and strategy; iii. innovation and entrepreneurship public policy analysis, management and strategy and v. innovation and entrepreneurship legal analysis and studies.

FINDINGS OR EXPECTED OUTCOMES:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Qualified professionals are expected to lead the entire Innovation and Entrepreneurship track, being able to support the entire ecosystem (young entrepreneurs, research groups, incubators, startups...) by managing contracts; organizing the intellectual property process; connecting the ecosystem with external partners to transfer technology, in addition to supporting the Agency's communication with news, articles and also organizing events.

ORIGINALITY/VALUE:

The program for training managers in academic innovation and entrepreneurship at the USP is a unique initiative that addresses the growing demand for professionals in this field. Given USP's global relevance and the strategic role of AUSPIN in innovation management, this program aims to equip managers to optimize research and development projects, promoting agility, partnerships, and tangible results for society. With a focus on efficiently managing units such as EMBRAPPI (Brazilian Association for Research and Social Innovation), CPE (Engineering Research Centers) and CEPID (Innovation and Diffusion Research Center), the program also includes studies on technological prospecting, market intelligence, and technology transfer strategies, strengthening the university's innovation ecosystem and its relationship with companies and stakeholders.

PRACTICAL/SOCIAL IMPLICATIONS:

Training qualified professionals can improve the connection between academic developments and industry, leading to countless benefits for society. Effective management of intellectual property, technology transfer, and licensing can result in more efficient dissemination of rich drug discoveries, machines, industrial processes, new materials, biological products, medical procedures, and other innovations. This can help these products and technologies reach the end user more quickly and benefit society as a whole.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

We envision that the PGI endeavors can provide valuable insights into key directions toward the creation and implementation of initiatives for the development of innovation in the triple helix structure

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

(academia-industry-government). We believe PGI's accomplishments can support USP to foster the academic and applied science that will contribute to the socioeconomic development of the State of São Paulo, by enhancing the use of scientific, technological, and cultural knowledge generated in universities.

KEYWORDS (3-5): Skilled workforce; Innovation; Entrepreneurship; USP ecosystem; University.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Camila do Nascimento Cultri	Brazil	AUSPIN	cultri@usp.br
Giovanna de Fatima Moreno Aguiar	Brazil	AUSPIN	giaguilar@usp.br
Heloise Ribeiro de Barros	Brazil	AUSPIN	barroshr@usp.br
Kelly Cristina de Lira Lixandrão	Brazil	AUSPIN	kelly.lira@usp.br
Stanley Bilatto	Brazil	AUSPIN	stanley.bilatto@usp.br
Luiz Henrique Catalani	Brazil	AUSPIN	catalani@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Navigating Work and Skills Transformation: Strategic Policies for Talent Development and Collaboration

TYPE: Practical case / experience analysis

TRACK: Talent Development and Collaboration

PURPOSE: This study presents a comprehensive analysis of the multifaceted impacts of global trends on economies, labour markets, jobs, and talent development. By employing foresight methodologies and integrating insights from recent literature on skills intelligence, vocational education, and innovation systems, the study aims to provide actionable recommendations for policymakers, educators, businesses, and individuals to navigate the complexities of the evolving workforce landscape and foster sustainable economic growth and social development. The paper seeks to understand how global trends shape economies, labour markets, and skills and to offer insights into the complex interactions between global and local dynamics. It aims to inform strategic decision-making in workforce development, education reforms, and economic policies, aligning with recommendations such as implementing labour market reforms and ensuring equal opportunities for all in tertiary education. Addressing challenges posed by migration, digitalisation, and climate change requires collaborative efforts and innovative solutions, emphasising the importance of fostering a culture of foresight and investing in lifelong learning, consistent with recommendations like conducting anticipatory analyses of new occupations and associated skills needs.

DESIGN/METHODOLOGY/APPROACH: The study engages stakeholders in a participatory process to anticipate transformations across economic, societal, scientific, technological, environmental, and political realms. Through horizon scanning some 50 key trends shaping the future of work, talent and skills were identified, providing a comprehensive basis for analysis. Employing foresight methodologies, the study progresses logically, first assessing the general impact of selected global trends, then conducting an in-depth analysis of their effects on job structures, labour markets, and skill compositions. It identifies necessary changes in education and lifelong learning systems, aligning with recommendations such as fostering a culture of foresight and conducting anticipatory analyses of emerging occupations.

FINDINGS: Global trends, such as globalisation, demographic shifts, digitalisation, and climate change, profoundly impact economies and employment worldwide. These trends interact with local dynamics like the platform economy, robotics, urbanisation, and population ageing, affecting developed, transition, and developing countries differently. Migration, digitalisation, artificial Intelligence (AI) and automation redefine work dynamics and skill demands, necessitating reforms in education and lifelong learning systems. The findings underscore the importance of implementing recommendations such as investing significantly in education, VET, and lifelong learning systems and fostering entrepreneurial and innovation mindsets across all education levels to adapt to these changes.

ORIGINALITY: The study offers a comprehensive analysis of how global trends shape economies, labour markets, and skills, providing insights into the complex interactions between global and local dynamics. It highlights the value of foresight methodologies and diverse skills anticipation methods in anticipating future transformations and underscores the necessity of adapting education systems to meet evolving skill demands. The study contributes to the literature by providing actionable recommendations for policymakers, educators, businesses, and individuals to navigate the complexities of the evolving workforce landscape and foster sustainable economic growth and social development.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

PRACTICAL/SOCIAL IMPLICATIONS: Understanding the impacts of global trends has practical implications for policymakers, educators, businesses, and individuals. It informs strategic decision-making in workforce development, education reforms, and economic policies, aligning with recommendations such as implementing labour market reforms and ensuring equal opportunities for all in tertiary education. Addressing challenges posed by migration, digitalisation, AI, and climate change requires collaborative efforts and innovative solutions, emphasising the importance of fostering a culture of foresight and investing in lifelong learning, consistent with recommendations like conducting anticipatory analyses of new occupations and associated skills needs.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Future research could explore the long-term implications of global trends on specific industries, regions, and demographic groups, building upon recommendations such as developing regionally coordinated strategies. Additionally, the study's findings may be limited by data availability and the complexity of predicting future trends accurately, underscoring the need for further advancements in foresight approaches and interdisciplinary research collaborations. Methodological enhancements could include incorporating qualitative approaches and sectoral studies to enrich the analysis and improve the study's robustness and applicability. Further exploration of the intersectionality of global trends and their impacts on societal inequality and political instability could provide valuable insights for policy formulation and implementation, aligning with recommendations like combating societal inequality through transparent government initiatives and mechanisms. By integrating insights from recent literature on skills anticipation, vocational education, and innovation systems, the study provides a nuanced understanding of the evolving workforce landscape and identifies avenues for future research to deepen our understanding of the complex interactions between global trends, economies, labour markets, and skills.

KEYWORDS (3-5)

Global Trends, Skills, Talent, Vocational and Educational Training, Foresight.

REFERENCES

- A.T. Kearney (2017), Global Services Location Index 2017: The Widening Impact of Automation. www.atkearney.com/documents/20152/793366/The+Widening+Impact+of+Automation.pdf/42b06cf4-e5f9-d8ec-a30c-a82dd26d4953
- Arntz, M., Gregory, T. and Zierahn, U., (2016) 'The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis', OECD Social, Employment and Migration Working Papers, No 189, OECD Publishing, Paris. <http://dx.doi.org/10.1787/5jlz9h56dvq7-en>
- Autor, D.H. (2015), 'Why Are There Still So Many Jobs? The History and Future of Workplace Automation', Journal of Economic Perspectives, Vol. 29, No 3, pp. 3–30.
- Autor, D.H., Levy, F. and Murnane, R.J. (2003), 'The Skill Content of Recent Technological Change: An Empirical Explanation', Quarterly Journal of Economics, Vol. 118, No 4, 2003, pp. 1279–1333.
- Beblavý, M., Akgüç, M., Fabo, B. and Lenaerts, K. (2016) What are the new occupations and the new skills? And how are they measured?: State of the art report, Working paper, InGRID project, M21.6, Leuven. <https://docplayer.net/57056239-What-are-the-new-occupations-and-the-new-skills-and-how-are-they-measured.html>.
- Behrens, A., Coulie, C. and Teusch, J., (2013) 'The Potential Evolution of the European Energy System until 2020 and 2050', NeuJobs State of the Art Report, No D11.1.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Brynjolfsson, E. and McAfee, A., (2012), 'Jobs, Productivity and the Great Decoupling, Global Opinion', The New York Times. www.nytimes.com/2012/12/12/opinion/global/jobs-productivity-and-the-great-decoupling.html

Brynjolfsson, E. and McAfee, A., (2014) The Second Machine Age, Work, Progress, and Prosperity in a Time of Brilliant Technologies, W.W. Norton & Company.

Cedefop (2024). Next generation skills intelligence for more learning and better matching: skills anticipation trends, opportunities and challenges in EU Member States. Luxembourg: Publications Office. <http://data.europa.eu/doi/10.2801/180485>

Colijn, B. and Behrens, A., (2015) 'Limits of Power: Energy, Growth and Employment', in Beblavý, M., Maselli, I. and Veselkova, M. (eds), Green, Pink & Silver: The Future of Labour in Europe, Vol. 2, Centre for European Policy Studies. www.ceps.eu/publications/green-pink-silver-future-labour-europe-vol-2

Crosby, O. (2002), 'New and Emerging Occupations', Occupational Outlook Quarterly, Fall, pp. 17–25.

Davis, J., (2015) Capital Markets and Job Creation in the 21st Century, Centre for Effective Public Management at Brookings.

Damarin, A.K. (2006), 'Rethinking Occupational Structure: The Case of Web Site Production Work', Work and Occupations, Vol. 33, No 4, pp. 429–463.

De Backer, K. and Miroudot, S. (2013), 'Mapping Global Value Chains', OECD Trade Policy Papers, No 159, OECD Publishing, Paris. <https://doi.org/10.1787/5k3v1trgnbr4-en>

ESCWA (2017) Transport and Connectivity to Global Value Chains: Illustrations from the Arab region, Economic and Social Commission for Western Asia. www.unescwa.org/publications/transport-connectivity-global-value-chains

ETF/Cedefop/ILO (2015), The role of employment service providers: Guide to anticipating and matching skills and jobs Vol. 4, Publications Office of the European Union, Luxembourg, European Training Foundation/European Centre for the Development of Vocational Training/International Labour Office. Available online at: www.etf.europa.eu/web.nsf/pages/Vol.4_Employment_service_providers

ETF/Cedefop/ILO (2016a), Developing skills foresights, scenarios and forecasts: Guide to anticipating and matching skills and jobs Vol. 2, Publications Office of the European Union, Luxembourg, European Training Foundation/European Centre for the Development of Vocational Training/International Labour Office, Available online at: www.etf.europa.eu/web.nsf/pages/Vol.2_Developing_skills_foresights

ETF/Cedefop/ILO (2016b), Working at sectoral level: Guide to anticipating and matching skills and jobs Vol. 3, Publications Office of the European Union, Luxembourg, European Training Foundation/European Centre for the Development of Vocational Training/International Labour Office. Available online at: www.etf.europa.eu/web.nsf/pages/Vol.3_Working_at_sectoral_level

EY (2015), 'Megatrends. Making sense of a world in motion'. [www.ey.com/Publication/vwLUAssets/ey-megatrends-report-2015/\\$FILE/ey-megatrends-report-2015.pdf](http://www.ey.com/Publication/vwLUAssets/ey-megatrends-report-2015/$FILE/ey-megatrends-report-2015.pdf)

Frey, C.B. and Osborne, M.A. (2015), Technology at Work: The Future of Innovation and Employment, Oxford Martin School, Oxford. www.oxfordmartin.ox.ac.uk/downloads/reports/Citi_GPS_Technology_Work.pdf

Grech, A., and Camilleri, A. F. (2020). The digitization of TVET and skills systems.

Hanson, G., and Slaughter, M.J. (2016), High-skilled immigration and the rise of STEM occupations in U.S. employment, NBER Working Paper Series, No 22623, National Bureau of Economic Research, Cambridge MA. www.nber.org/papers/w22623, https://gps.ucsd.edu/_files/faculty/hanson/hanson_research_stem_102016.pdf

Heeks, R. (2017), Decent work and the digital gig economy: A developing country perspective on employment impacts and standards in online outsourcing, crowdwork, etc, Development Informatics Working Paper Series, No 71, Centre for Development Informatics, The University of Manchester, Manchester, UK Available online at: http://hummedia.manchester.ac.uk/institutes/gdi/publications/workingpapers/di/di_wp71.pdf

ITUC (2017), Investing in care economy: Simulating employment effects by gender in countries in emerging economies,

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

International Trade Union Confederation. www.ituc-csi.org/IMG/pdf/care_economy_2_en_web.pdf

Lewis, P. (2023). Innovation, technician skills, and vocational education and training: connecting innovation systems and vocational education and training. *Journal of Vocational Education & Training*, 1-28.

McKinsey Global Institute (2017), Jobs lost, jobs gained: Workforce transitions in a time of automation, December. www.mckinsey.com/global-themes/future-of-organizations-and-work/what-the-future-of-work-will-mean-for-jobs-skills-and-wages

NESTA (2017), The future of skills: Employment in 2030. www.nesta.org.uk/publications/future-skills-employment-2030

OECD (2017), Organisation for Economic Cooperation and Development), 'Chapter 3: How technology and globalisation are transforming the labour market', 30–31 March 2017, OECD Conference Centre, Paris.

OECD (2018), The Future of Education and Skills: Education 2030, Organisation for Economic Cooperation and Development. [www.oecd.org/education/2030/E2030%20Position%20Paper%20\(05.04.2018\).pdf](http://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf)

Popper, R., and Loikkanen, T. (2019). The Future of Work and Skills in ETF Partner Countries. ETF Issues Paper. European Training Foundation. <https://eric.ed.gov/?id=ED597201>

Redecker, C., Leis, M., Leendertse, M., Punie, Y., Gijsbers, G., Kirschner, P., Stoyanov, S. and Hoogvel, B. (2011), The Future of Learning: Preparing for Change, JRC Scientific and Technical Reports, EUR 24960 EN, Publications Office of the European Union, Luxembourg. <http://ftp.jrc.es/EURdoc/JRC66836.pdf>

Schultz, E. and Geyer, J. (2013), Societal change, care need and long-term care workforce in selected European countries, NeuJobs, Berlin. www.econstor.eu/bitstream/10419/128602/1/Schulz_2013_Societal-Change-Care.pdf

Sigelman, M., Taska, B., O'Kane, L., Nitschke, J., Strack, R., Baier, J., Breitling, F. and Kotsis, Á. (2022), Shifting skills, moving targets, and remaking the workforce. People Strategy/Report.

UN DESA (2017), Changing population age structures and sustainable development: A concise report, United Nations Department of Economic and Social Affairs Population Division, UN DESA. www.un.org/en/development/desa/population/publications/pdf/trends/ConciseReport2017/English.pdf

UNESCO (2010), UNESCO Science Report 2010: The Current Status of Science around the World, United Nations Educational, Scientific and Cultural Organisation, Paris.

UNESCO (2014) UNESCO Education Strategy 2014–2021, United Nations Educational, Scientific and Cultural Organisation, Paris. <https://unesdoc.unesco.org/ark:/48223/pf0000231288>

World Bank (2016), World Development Report 2016: Digital Dividends, World Bank, Washington, DC.

CONTACT INFO

NAME & SURNAME	COUNTRY	ORGANIZATION	EMAIL
Rafael Popper	Finland	University of Turku	Rafael.Popper@utu.fi
Torsti Loikkanen	Finland	Sapar Oy	Torsti.Loikkanen@sapar.fi

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Psychological safety in pluri-intelligent cities : digital citizenship in transformation

TYPE b. research Design

TRACK: 2. Talent Development and Collaboration

PURPOSE: Considerations on the relevance of psychological safety in the context of pluri-intelligent cities i.e. those which conceal other forms of intelligence than human, presenting post-urban scenarios where the former idea of a Greek polis is no longer suitable.

DESIGN/METHODOLOGY/APPROACH: Several epistemic assumptions are presented for a preliminar study of the matter in an exploratory way as developed in the paper, taking into consideration the particularities of Brazilian scenario in order to call attention of managers, leaders and scholars to the core theme.

FINDINGS OR EXPECTED OUTCOMES: It is argued that in the implementation of pluri-intelligent cities in Brazil it is needed to consider studies on digital transformation, management, technology and social psychology so as to avoid distorted extremes such as “digitized slums” or “residential marketplaces”, deeming technology and digital transformation as positive factors so as to create a psychological safety and psycho-social culture for the sake of common good and embracing digital transformation advantages on behalf of the future of Brazilian cities, opening opportunities for the leaders in the field.

ORIGINALITY/VALUE: The topic of psychological safety in the context of pluri-intelligent cities seems to be largely overlooked in the literature so far, so this paper is a preliminary exploration of the theme in the realm of digital transformation issues

PRACTICAL/SOCIAL IMPLICATIONS: It is emphasised that new leadership must emerge so as to cope with appalling challenges related to te implementation of pluri-intelligent cities in Brazil

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

and elsewhere. This approach to leadership must conceal psychological safety to cope with avoidable, complex and intelligent errors to ensure the sustainability of value chain in pluri-intelligent cities and inform action plans to avoidance and coping with failures in this scenario.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This proposal opens up new directions for the study of psycho-social impact of intelligence technologies in future scenarios.

KEYWORDS (3-5) : Smart cities, Digital transformation, Psychological safety, Management, Brazilian cities

REFERENCES

BARNS, Sarah. Re-engineering the city : platform ecosystems and the capture of urban big data. **Frontiers in Sustainable Cities**, v.2 n. 32, 2020.

BRASIL. CÂMARA DOS DEPUTADOS. **Projeto de lei 976 de 2021**. Institui a Política nacional de Cidades Inteligentes e dá outras providências. Disponível online <http://www.camara.leg.br>. Acesso em 01.12.2023a.

BRASIL. SENADO FEDERAL. **Projeto de Lei 2338 de 2023**. Dispõe sobre o uso da inteligência artificial. Disponível online <http://www.senado.leg.br>. Acesso em 01.12.2023b.

CANCLINI, Néstor García. **Cidadãos substituídos por algoritmos**. São Paulo : Edusp, 2021.

CARMEI, Abraham et al. Transformational leadership and creative problem-solving: The mediating role of psychological safety and reflexivity. **The Journal of Creative Behavior**, v. 48, n. 2, p. 115-135, 2014.

CARVALHO, Sônia Marise Salles et al. Smart Cities: avaliação das características dos ecossistemas de inovação de duas cidades inteligentes brasileiras. **Cadernos de Prospecção**, v. 13, n. 3, p. 693-706, 2020.

DI FELICE, Massimo. Depois da metrópole, as redes info-ecológicas e o fim da experiência urbana. **Revista de Comunicação e Linguagens**, n.48, 2018

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

DI FELICE, Massimo. **A cidadania digital** : a crise da ideia ocidental de democracia e a participação nas redes digitais. São Paulo : Paulus, 2020.

DUNKER, Christian I.L. **Mal-estar, sofrimento e sintoma** : uma psicopatologia do Brasil entre muros. 1.ed. São Paulo : Boitempo, 2015.

EDMONDSON, Amy C. **A organização sem medo** : criando segurança psicológica no local de trabalho para aprendizado, inovação e crescimento. Rio de Janeiro : Alta Books, 2020.

EDMONDSON, Amy C., BRANSBY, Derrick P. Psychological safety comes of age : observed themes in an established literature. **Annual Review of Organizational Psychology and Organizational Behaviour**, n.10, p. 55-78, 2023.

GREEN, Ben, VILJOEN, Salomé. Algorithmic realism : expanding the boundaries of algorithmic thought. In: **Conference on Fairness, Accountability and Transparency (FAT)**, ACM, jan. 27-30 2020, Barcelona, Spain.

HAN, Byung-Chul. **Infocracia** : digitalização e a crise da democracia. Petrópolis : Vozes, 2022.

KRENAK, Ailton. **Futuro ancestral**. 1.ed. São Paulo : Companhia das Letras, 2022.

LARA, Alexander Prado et al. Smartness that matters: towards a comprehensive and human-centred characterisation of smart cities. **Journal of Open Innovation: Technology, Market, and Complexity**, v. 2, n. 2, p. 1-13, 2016.

LÉVY, Pierre. **As tecnologias da inteligência** : o futuro do pensamento na era da informática. 1.ed. Rio de Janeiro : Editora 34, 1993.

LOVELOCK, James. **Novaceno** : o advento da era da hiperinteligência. Lisboa : Edições 70, 2020.

MENDES, Fabiana Maria da Conceição. **Cidades inteligentes e cidades sustentáveis** : uma análise comparativa à luz da literatura e das ISOS: 37120:2018 e 37122:2019. Curitiba : [s.n.], 2021. Dissertação (Mestrado), Universidade Tecnológica Federal do Paraná.

MOROZOV, Evgeny, BRIA, Francesca. **A cidade inteligente** : tecnologias urbanas e democracia. São Paulo : Ubu Editora, 2019.

PALHARINI, Cristiano Fernando Goi, OLIVEIRA, Tarcisio Dorn de, ALLEBRANDT, Sérgio Luís. Sustentabilidade e as estratégias nacionais para cidades inteligentes: relações entre a agenda 2030, Carta Brasileira para Cidades Inteligentes e a Política Nacional de Cidades

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Inteligentes. **Anais do Simpósio Latino-Americano de Estudos de Desenvolvimento Regional**, v. 3, n. 1, 2023.

PATTERSON, Clare M.; NURSE, Jason RC; FRANQUEIRA, Virginia NL. Learning from cyber security incidents: A systematic review and future research agenda. **Computers & Security**, p. 103309, 2023.

SANTAELLA, Lucia (org.) **Cidades inteligentes** : porque, para quem ? 1.ed. São Paulo : Estação das Letras e Cores, 2016.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Samuel Robinson Miranda de Souza	Brazil	ECA/USP	srmsouza@usp.br
Eliziane da Silva Lima	Brazil		

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (minimum 500 words, maximum 1000 words)

TITLE: Using metagame for hiring process: A case about new members recruitment process

TYPE: practical case / experience analysis

TRACK: 2. Talent Development and Collaboration

PURPOSE: Since the assessment of soft skills in a selection process is a topic that is increasingly being studied by researchers and endorsed by the job market, it is still a subjective topic and with several challenges to be solved. Games have an incredible capacity for innovation, in addition to the fact that they are, by default, a problem-situation that the player must solve. Why not using the lens of gaming, even going so far as to redefine the very nature of games in order to show soft skills in a hiring process? This was the inquiry put forth by a university extension group dedicated to game development, which annually hosts a selection process for new members. They conducted a thorough analysis of their current hiring methods and identified areas for improvement. One emerging technological trend in the field of human resources is the use of game-based approaches to improve and modernize the recruitment, selection, and onboarding processes. After a review of relevant literature and best practices in the field, the university extension group decided to incorporate gamified assessments into their hiring process. Specifically, they developed a new methodology that required candidates to design and create new games based on traditional games in other words, using metagame concepts. In 2023, the integration of metagame and innovation into the hiring process brought a fresh perspective to the candidates and to the group itself. The aim of this paper is to analyze the practical case of using a game design challenge in a hiring process and to evaluate its effectiveness in assessing candidates' soft skills and personal values.

DESIGN/METHODOLOGY/APPROACH: After studying articles about game-based approaches and the use of metagame and innovation in HR, the group designed the exercise. To achieve the

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

objective of the activity, the group utilized four complete decks of UNO™ cards, supported by six-sided dice and standard playing cards with four suits. Additionally, common stationery materials such as paper, pens, and pencils were used. The time allocated for developing the game projects was 45 minutes, after which each team of candidates was required to present their project in a three-minute pitch format. Each stage was overseen by evaluators from the group, with each team of candidates having a fixed group evaluator and a set of "floating" evaluators who moved between teams to compare them on a macro level.

FINDINGS OR EXPECTED OUTCOMES: With the statement "Create games that have never been invented using the provided materials," the candidates developed four different games. The group initially observed a significant challenge among the participants in letting go of traditional practices and embracing innovation, but this obstacle lessened as time passed. The initial game developed was called "Colorful Gateways" In this gaming project, the participating team utilized a UNO™ deck to construct a playing field where the cards were randomized before each session, guaranteeing unique experiences for every match. Ultimately, two serious games were created along with a RPG and a traditional board game. During the assessment, the emphasis was on evaluating the overall development of the project rather than just considering the quality of presentations. The evaluation also focused on assessing each candidate's interactions and reactions to other participants' ideas, providing valuable insights for making decisions about approving or rejecting candidates. This proposal aimed to assess their critical thinking skills, teamwork abilities, and capacity to adjust to evolving situations. This not only provided a more holistic view of their capabilities but also allowed the group to assess their emotional intelligence, resilience, and leadership potential. The success of this approach not only led to the selection of highly skilled individuals but also laid the foundation for a more dynamic and inclusive organizational culture. It emphasized the importance of creating a hiring process that values not just technical expertise, but also the essential soft skills that contribute to a well-rounded and effective team. A voluntary participation questionnaire was administered to the 10 candidates who underwent this activity. The results of the questionnaire indicated that the candidates found the game design challenge to be a highly engaging and unique experience.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

ORIGINALITY/VALUE: The originality of this approach led to a significant improvement in the quality of candidates applying for the university extension group. By incorporating gamified assessments, the group not only attracted individuals with a passion for game design but also identified candidates with the creativity and problem-solving skills necessary for success in their roles. The results of this innovative approach were highly encouraging, with a higher retention rate and overall satisfaction among the newly hired members.

PRACTICAL/SOCIAL IMPLICATIONS: From a practical standpoint, other organizations can learn from this case study and consider implementing similar gamified assessments in their own hiring processes. This approach not only attracts candidates with specific skill sets but also creates an engaging and innovative experience for potential employees/members, ultimately leading to a more diverse and talented pool of applicants. Additionally, the social implications of this methodology are noteworthy. By recognizing and valuing the creative and problem-solving abilities of candidates, the university extension group has fostered a work environment that celebrates diversity of thought and unconventional approaches. This not only benefits the organization by bringing in individuals with unique perspectives and talents but also contributes to a more inclusive and dynamic workplace culture. Furthermore, the success of this new methodology serves as a model for other departments and organizations within the field of human resources to rethink traditional hiring practices and explore more innovative and engaging approaches to talent acquisition. Once this methodology is refined and its potential is substantiated, the group intends to disseminate it to other groups, thereby amplifying the practical and social impacts outlined within their university.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The organizational culture of an extension group can be affected by these concepts, and the impact can be positive and scalable. In the future, it is intended to delve deeper into the studies of the impacts that the proposed dynamics had on the group as a whole. Long-term plans include conducting training and forming partnerships to assist other university extension groups in adapting the methodology created for their contexts

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

and realities, thus gaining clarity on whether the method is scalable.

KEYWORDS (3-5): Soft skills, Metagame, Innovation in human resources, Game-based approaches

REFERENCES

A. Marczewski. (2015). *Game Thinking. Even Ninja Monkeys Like to Play: Gamification, Game Thinking and Motivational Design*, 1st ed. CreateSpace Independent Publishing Platform.

Boluk, S., & LeMieux, P. (2017). *Metagaming: Playing, competing, spectating, cheating, trading, making, and breaking videogames (Vol. 53)*. U of Minnesota Press.

Bina, S., Mullins, J., & Petter, S. (2021). *Examining game-thinking in human resources recruitment and selection: A literature review and research agenda*.

Leutner, F., Akhtar, R. and Chamorro-Premuzic, T. (2022), "Gamification and Game-Based Assessments", *The Future of Recruitment (The Future of Work)*, Emerald Publishing Limited, Leeds, pp. 119-145.

Sharma, V. (2018). *Soft Skills: An Employability Enabler*. In *Journal of Soft Skills*, 12(2), 25–32.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Manoela Barreto de Oliveira Reis	Brazil	Universidade de São Paulo	manoela.reis@usp.br
Lana Nogueira Vieira	Brazil	Universidade de São Paulo	
Ana Vitória Eichenberger Teixeira	Brazil	Universidade de São Paulo	
Erick Oda Coulter	Brazil	Universidade de São Paulo	

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Lorenzo Dutra de Oliveira Sales Decari Vicentin	Brazil	Universidade de São Paulo	
Isabeli Gomes Oliveira	Brazil	Universidade de São Paulo	
Guilherme Vendruscolo Cangemi Silva	Brazil	Universidade de São Paulo	
Felipe Silva Barbosa Santos	Brazil	Universidade de São Paulo	

03

Disruptive Technologies and Sustainable Development

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Workforce Management Implementation in energy sector: challenges, opportunities, and strategies

TYPE: Practical case

TRACK: 3. Disruptive Technologies and Sustainable Development > - Sustainable applications of disruptive technologies in various sectors

PURPOSE: Debates on human resources management in a changing world are increasing among academics and practitioners. Adopting strategies to deal with the “War for Talent” is crucial to every business’s sustainability. One of key strategies is to make use of WFM solutions. Workforce management is a set of techniques designed to allocate resources, improve efficiency, forecast workloads, and manage schedules. This paper aim to investigate challenges, opportunities, and strategies on implementing Workforce Management in a company from energy sector, covering all Project management steps.

DESIGN/METHODOLOGY/APPROACH: action-research approach based on Thiollent (2011). Data will be collected from semi-structured interviews recorded and transcribed utilizing online meetings, documents (data collection triangulation). Data analysis will be performed following thematic analysis (Braun and Clarke, 2006), aided by Atlas.ti version 24 as the qualitative analysis software.

FINDINGS OR EXPECTED OUTCOMES: Demonstrate and reflect on how this company is facing challenges in a changing world, providing solution to internal problems and contributing to business results. We will present findings following each Action research step: 1) identifying problem/opportunity; 2) gathering relevant data; 3) interpreting data; 4) acting on evidence and 5) evaluating results.

ORIGINALITY/VALUE: Participatory research cases are not frequently seemed in Academia. The originality of this paper lies on bringing the voice of all key participants working in partnership: academics and practitioners following all the steps of action-research method.

PRACTICAL/SOCIAL IMPLICATIONS: Practitioners can benefit from this research paper on learning

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

from a complex implementation in a heavily regulated sector. Academics can benefit from extending the existing literature on Workforce Management, Project, and Change Management. The results of this study can be replicated in different contexts.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Avenues for future research include research papers inquiring employees and other stakeholders on the Workforce Management implementation, in a longitudinal study. We also suggest a quantitative research approach, measuring the effects of Workforce Management on business outcomes.

KEYWORDS: Workforce Management; Industry 4.0; Strategic HRM; Change Management.

REFERENCES

- Braun, V., & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Calzavara, M., Battini, D., Bogataj, D., Sgarbossa, F., & Zennaro, I. (2020). Ageing workforce management in manufacturing systems: state of the art and future research agenda. *International Journal of Production Research*, 58(3), 729-747.
- Hayes, J. (2002). *The Theory and practice of change management*. New York: Palgrave, 2002.
- Hennigan, L. (2022). What is Workforce Management?. *Forbes Advisor*. <https://www.forbes.com/advisor/business/what-is-workforce-management/>
- Khang, A., Rani, S., Gujrati, R., Uygun, H., & Gupta, S. K. (Eds.). (2023). *Designing Workforce Management Systems for Industry 4.0: Data-Centric and AI-Enabled Approaches*. CRC Press.
- PMI. *Managing Change in Organizations: a Practice Guide*. Pensilvania, EUA: Project Management Institute, Inc, 2013.
- PROSCI OF TRADEMARKS ARE ADKAR AND PEOPLE, CHANGE, RESULTS. (2022). Available in: <https://peoplechange.com.br/>.
- Thiollent, M. (2011). Action Research and Participatory Research: An Overview. *International Journal of Action Research*, 7(2), 160-174. <https://nbn-resolving.org/urn:nbn:de:0168-ssaoar-414079>

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Tripp, D. (2005). Pesquisa-ação: uma introdução metodológica. Educação e Pesquisa, 31(3), 443-466.
<https://doi.org/10.1590/S1517-97022005000300009>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Paula Massako Bernardes Suda	Brazil	FGV-EAESP	Paula.suda@fgv.edu.br
Sergio Isidoro Canestraro Milani	Brazil	COPEL	sergio.milani@copel.com
Fernando Veroneze	Brazil	FIA/SMR Consultoria	veroneze@smrconsultoria.com
Fernando de Souza Meirelles	Brazil	FGV-EAESP	Fernando.meirelles@fgv.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: How Foresight and Horizon Scanning Shape Emerging Technologies and Disruptive Innovations Research?

TYPE: Practical case / experience analysis

TRACK: Disruptive Technologies and Sustainable Development

PURPOSE: This paper explores the significance of foresight and horizon scanning (HS) in anticipating emerging technologies (ET) and disruptive innovations (DI) for science, technology, and innovation (STI) policy and funding. It showcases innovative practices globally, emphasising their relevance for policymakers and stakeholders.

DESIGN/METHODOLOGY/APPROACH: The study draws insights from four case studies to illustrate innovative practices globally. It utilises a comprehensive search on Elsevier's ScienceDirect platform to analyse trends in publications related to ET and DI since 2000, identifying top subject areas. Definitions for ET and DI are established for clarity. Additionally, it distinguishes between HS and foresight methodologies, highlighting their respective roles in policy development and transformation. The paper is also based on a study within the ANTICIPINNOV project focused on 'Anticipation and monitoring of emerging technologies and disruptive innovation', a collaboration between the European Commission Joint Research Centre and the European Innovation Council (EIC).

FINDINGS: The findings reveal significant growth in publications on ET and DI over the past two decades, with distinct subject areas of interest. The case studies demonstrate diverse foresight and HS approaches, including top-down, bottom-up, inward-looking, and outward-looking strategies, each offering unique insights for policy and funding. Notably, the iKnow project showcases a proactive HS methodology, while the CASI/BOLERO projects emphasise sustainable innovation and societal impact. ENISA's Trends in AI for Cybersecurity project and the Centre for Workforce Intelligence's Technology Horizon Project offer insights into disruptive technologies' implications for cybersecurity and healthcare workforce planning, respectively.

ORIGINALITY: This paper contributes to the literature by presenting innovative foresight and HS practices and their relevance for European policymakers and stakeholders. It offers insights into the growth of publications on ET and DI and identifies key subject areas of interest. By distinguishing between HS and foresight methodologies, it provides clarity on their roles in STI policy development. The case studies highlight practical applications of HS in addressing diverse challenges, emphasising the importance of anticipatory governance and sustainable transitions.

PRACTICAL/SOCIAL IMPLICATIONS: The study's practical implications lie in informing policymakers and stakeholders about innovative HS practices and their potential impact on STI policy and funding. By showcasing diverse HS approaches and methodologies, it offers insights into addressing emerging challenges and opportunities in various domains. The emphasis on sustainability and societal impact underscores the importance of responsible innovation and anticipatory governance in shaping desirable futures. Socially, the paper promotes collaboration and knowledge sharing among diverse stakeholders, fostering a forward-thinking culture in policymaking and

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

decision-making processes. It highlights the importance of foresight in navigating uncertainties and envisioning transformative changes, thereby contributing to sustainable development and societal well-being.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Further research could explore the effectiveness of HS methodologies in different contexts and industries, considering factors such as organisational culture, stakeholder engagement, and resource availability. Additionally, longitudinal studies could assess the long-term impact of HS on STI policy development and implementation. Limitations include the reliance on secondary data sources for trend analysis and case study selection bias. Future studies could address these limitations by employing mixed-method approaches and incorporating primary data collection methods. Moreover, the contextual relativity of ET and DI definitions warrants further investigation to ensure cross-cultural applicability. Despite these limitations, the paper provides valuable insights into innovative foresight and HS practices and their implications for STI policy and funding, paving the way for future research in this area.

KEYWORDS (3-5)

Sustainable Development, Emerging Technologies, Disruptive Innovations, Foresight, Horizon Scanning

REFERENCES

- Adner, R., 2002. When are technologies disruptive? A demand-based view of the emergence of competition. *Strategic management journal*, 23(8), pp.667-688.
- Adner, R. and Levinthal, D.A., 2002. The emergence of emerging technologies. *California management review*, 45(1), pp.50-66.
- Adner, R. and Zemsky, P., 2005. Disruptive technologies and the emergence of competition. *RAND Journal of Economics*, pp.229-254.
- Andersen, PD., Bevolo, M., Ilevbare, I., Malliaraki, E., Popper, R., Spaniol, M. J. (2023) Technology Foresight for Public Funding of Innovation: Methods and Best Practices, Vesnic-Alujevic, L., Farinha, J., Polvora, A. (eds). Publications Office of the European Union, Luxembourg, 2023, doi: 10.2760/759692, JRC134544.
- Garnett, K., Lickorish, F.A., Rocks, S.A., Prpich, G., Rathe, A.A. and Pollard, S.J., 2016. Integrating horizon scanning and strategic risk prioritisation using a weight of evidence framework to inform policy decisions. *Science of the Total Environment*, 560, pp.82-91.
- Antonio, J.L. and Kanbach, D.K., 2023. Contextual factors of disruptive innovation: A systematic review and framework. *Technological Forecasting and Social Change*, 188, p.122274.
- Bower, J.L., Christensen, C.M., 1995. Disruptive technologies: catching the wave. *Harvard Business Review*, 73, 43–53.
- Cheng, Y., Huang, L., Ramlogan, R. and Li, X., 2017. Forecasting of potential impacts of disruptive technology in promising technological areas: Elaborating the SIRS epidemic model in RFID technology. *Technological Forecasting and Social Change*, 117, pp.170-183.
- Christensen, C.M., 1997. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business School Press, Boston, MA.
- Christensen, C.M., 2006. The ongoing process of building a theory of disruption. *Journal of Product innovation management*, 23(1), pp.39-55.
- Cozzens, S., Gatchair, S., Kang, J., Kim, K.S., Lee, H.J., Ordóñez, G. and Porter, A., 2010. Emerging technologies:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

- quantitative identification and measurement. *Technology Analysis & Strategic Management*, 22(3), pp.361-376.
- Cuhls, K.E., 2020. Horizon Scanning in Foresight—Why Horizon Scanning is only a part of the game. *Futures & Foresight Science*, 2(1), p.e23.
- Day, G.S. and Schoemaker, P.J., 2000. Avoiding the pitfalls of emerging technologies. *California management review*, 42(2), pp.8-33.
- Georghiou, L., Cassingena Harper, J., Keenan, M., Miles, I., & Popper, R., 2008. *The handbook of technology foresight: Concepts and practice*. Edward Elgar Publishing.
- Govindarajan, V. and Kopalle, P.K., 2006. The usefulness of measuring disruptiveness of innovations ex post in making ex ante predictions. *Journal of product innovation management*, 23(1), pp.12-18.
- Hansmeier, H. and Koschatzky, K., 2021. Addressing societal challenges through disruptive technologies. Results paper 3.
- Kim, S., Parboteeah, K.P., Cullen, J.B. and Liu, W., 2020. Disruptive innovation and national cultures: Enhancing effects of regulations in emerging markets. *Journal of Engineering and Technology Management*, 57, p.101586.
- Klenner, P., Hüsigg, S. and Dowling, M., 2013. Ex-ante evaluation of disruptive susceptibility in established value networks—When are markets ready for disruptive innovations?. *Research Policy*, 42(4), pp.914-927.
- Kostoff, R.N., Boylan, R. and Simons, G.R., 2004. Disruptive technology roadmaps. *Technological Forecasting and Social Change*, 71(1-2), pp.141-159.
- Lu, Z., Booth, K., Edwards, M., Popper, R., Boyd, A., Jones, B., Miles, I., Popper, M. and Velasco, G., 2013. *The technology horizon: Preliminary review on technologies impacting the future health and social care workforce*. Centre For Workforce Intelligence (CfWI).
- Markides, C., 2006. Disruptive innovation: In need of better theory. *Journal of product innovation management*, 23(1), pp.19-25.
- Martin, B.R., 1995. Foresight in science and technology. *Technology analysis & strategic management*, 7(2), pp.139-168.
- Nagy, D., Schuessler, J. and Dubinsky, A., 2016. Defining and identifying disruptive innovations. *Industrial marketing management*, 57, pp.119-126.
- Pandit, D., Joshi, M.P., Sahay, A. and Gupta, R.K., 2018. Disruptive innovation and dynamic capabilities in emerging economies: Evidence from the Indian automotive sector. *Technological Forecasting and Social Change*, 129, pp.323-329.
- Pinkse, J., Bohnsack, R. and Kolk, A., 2014. The role of public and private protection in disruptive innovation: The automotive industry and the emergence of low-emission vehicles. *Journal of Product Innovation Management*, 31(1), pp.43-60.
- Popper, R., 2008. How are foresight methods selected?. *Foresight*, 10(6), pp. 62-89.
- Popper, R., 2012. Mapping Futures Studies. *Foresight and STI Governance*, vol. 6, no 2, pp. 56-74 (in Russian)
- Popper, R. and Butler, J., 2011. *iKnow Policy Alerts, Report of the Blue Sky iKnow Project for the European Commission Directorate-General for Research and Innovation Socio-economic Sciences and Humanities*, Manchester: The University of Manchester. ISBN 978-0-946007-22-6.
- Popper, R., Georghiou, L., Cassingena, J., Havas, A., Morato, A., and Sokolov, A., 2010. *Lessons on How to Align Foresight with the STI Implementation Environment*, in Popper, R., Georghiou, L, Miles, I. and Keenan, M., *Evaluating Foresight: Fully-Fledged Evaluation of the Colombian Technology Foresight Programme (CTFP)*, Cali: Universidad del Valle, 220pp. ISBN 978-958-670-842-5.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

- Popper, R., Popper, M., and Velasco, G., 2020. 'Sustainable Innovation Assessment and Management Framework: Principles, Methodology and Practice' in Martini, M., Holsgens, R., Popper, R. (2020) (Eds), Governance and Management of Sustainable Innovation: Learning from experience to Shape the Future, Springer.
- Popper, R., Popper, M., Velasco, G., 2017. Towards a more responsible sustainable innovation assessment and management culture in Europe, Engineering Management in Production and Services, Sciendo, vol. 9(4), pages 7-20, December.
- Porter, A.L., Roessner, J.D., Jin, X.-Y., Newman, N.C., 2002. Measuring national emerging technology capabilities. Sci. Public Policy 29 (3), 189–200.
- Ravetz, J, Miles I, Popper R., 2011. iKnow ERA Toolkit: European Research Area Toolkit – Applications of Wild Cards and Weak Signals to the Grand Challenges & Thematic Priorities of the ERA: Manchester Institute of Innovation Research, University of Manchester. ISBN 978-0-946007-26-4.
- Rotolo, D., Hicks, D., and Martin, B. R. (2015). "What is an emerging technology?" Research Policy, 44(10), 1827-1843.
- Rowe, E., Wright, G. and Derbyshire, J., 2017. Enhancing horizon scanning by utilizing pre-developed scenarios: Analysis of current practice and specification of a process improvement to aid the identification of important 'weak signals'. Technological Forecasting and Social Change, 125, pp.224-235.
- Sandström, C., 2011. High-end disruptive technologies with an inferior performance. International Journal of Technology Management, 56(2/3/4), pp.109-122.
- Sardana, D., Fagan, T.R. and Wright, J.T., 2023. ChatGPT: A disruptive innovation or disrupting innovation in academia?. The Journal of the American Dental Association, 154(5), pp.361-364.
- Schmidt, G.M. and Druehl, C.T., 2008. When is a disruptive innovation disruptive?. Journal of product innovation management, 25(4), pp.347-369.
- Tellis, G.J., 2006. Disruptive technology or visionary leadership?. Journal of Product Innovation Management, 23(1), pp.34-38.
- Truong, Y. and Papagiannidis, S., 2022. Artificial intelligence as an enabler for innovation: A review and future research agenda. Technological Forecasting and Social Change, 183, p.121852.
- Velasco G., Popper R., Miles I., 2021. Repositioning People in Creative Futures: A Method to Create Sound Advice with Exploratory Scenarios. Foresight and STI Governance, 15(2), 25–38. DOI: 10.17323/2500-2597.2021.2.25.38.
- Weber, M., & Kubeczko, K. (2019). "Identifying emerging technologies at an early stage: An approach for capturing promising technologies based on bibliographic data." Technological Forecasting and Social Change, 141, 239-252.
- Zhang, F., Zhu, L., Xu, Z. and Wu, Y., 2023. Moving from reverse engineering to disruptive innovation in emerging markets: The importance of knowledge creation. Technovation, 125, p.102791.

CONTACT INFO

NAME & SURNAME	COUNTRY	ORGANIZATION	EMAIL
Rafael Popper	UK	The University of Manchester	Rafael.Popper@manchester.ac.uk

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE:

Innovation Management in the Age of AI: Evidence from the Healthcare Industry

TYPE (a. original research, b. research Design or c. practical case / experience analysis)

A. Original research

TRACK:

3. Disruptive Technologies and Sustainable Development

PURPOSE:

There is a clear interest of businesses worldwide to adopt artificial intelligence (AI) technologies aiming to achieve higher levels of productivity and competitiveness (Krakowski, Luger, & Raisch, 2023). As scholars point out, businesses are also interested in the use of AI applications as a means to enhance their development process of new products or services (Verganti, Vendraminelli, & Iansiti, 2020; Rammer, Fernández, & Czarnitzki, 2022; Bouschery, Blazeovic, & Piller, 2023).

However, effectively leveraging AI to enhance these innovation processes is particularly complex, since it involves a more data-driven approach to innovation (Sultana, Akter, & Kyriazis, 2022; Brem, Giones, & Werle, 2023). In fact, using machines for innovation may seem unrealistic, since innovative and creative thinking have traditionally been viewed as human skills (Amabile, 2019). Current literature in the field of innovation management, though, argues that the use of AI technologies as tools in the process may affect the speed and the outcome of new product development (NPD) processes. These AI-powered capabilities are often referred to as mechanical AI, thinking AI, and feeling AI (Huang, Rust, & Maksimovic, 2019;

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Sullivan & Wamba, 2024).

This way, the objective in this paper is to understand how different AI types of applications enhance the stages of new product development (NPD) processes.

DESIGN/METHODOLOGY/APPROACH:

Through an inductive qualitative approach based on a three-step research design, we identify the types of artificial intelligence that are integrated into each stage of the new product development (NPD) process of firms. Our initial investigation consisted of 11 in-depth interviews with managers of large organizations and founders of startups located in Brazil and working in the healthcare industry. This provided the researchers first impressions on the actual stage of adoption of AI. The second step consisted of additional 8 in-depth interviews with executives and senior managers of large organizations located in multiple sites (Europe, Asia, Oceania). These interviews had the objective to highlight use cases and understand how firms are experimenting AI specifically in innovation activities. Finally, our last step consisted of presenting 6 cases studies of AI solutions already in use (Eisenhardt & Graebner, 2007; Yin, 2014). These cases are specifically contextualized in the healthcare industry as well.

FINDINGS OR EXPECTED OUTCOMES:

Through the cases analyses, we expect to contribute to the understanding of how AI technologies influence innovation routines, increasing the productivity of innovation processes, and augmenting human cognitive capabilities for creating innovative outputs. Our preliminary findings suggest elements that may be modified in every stage of the NPD process in order to integrate AI technologies. Also, we identified that the closer the process is to the customer, the higher the need of applications of “feeling AI”.

ORIGINALITY/VALUE:

We present detailed firm-level empirical data about how firms organize their own resources and mobilize external actors in an AI-enabled new product development (NPD) process.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

PRACTICAL/SOCIAL IMPLICATIONS:

This research is relevant for managers in private organizations as it facilitates the understanding of how companies can coordinate resources, processes, structure and people in the organization to develop innovations using AI. Likewise, understanding the economics of adopting AI to generate innovations allows public policymakers to design measures that encourage professional training for individuals and the development of capabilities in companies to produce products with greater added value.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

We suggest that further studies examine the role of R&D alliances in fostering innovation in AI-enabled development of new products and services. With the increasing complexity of creating new offerings, firms are facing greater challenges in managing their R&D activities, especially in the context of emerging technologies such as artificial intelligence.

KEYWORDS (3-5)

Artificial intelligence; Innovation management; New product development; Healthcare industry.

REFERENCES

- Amabile, T. M. (2020). Creativity, artificial intelligence, and a world of surprises. *Academy of Management Discoveries*, 6(3), 351-354.
- Bouschery, S. G., Blazevic, V., & Piller, F. T. (2023). Augmenting human innovation teams with artificial intelligence: Exploring transformer-based language models. *Journal of Product Innovation Management*, 40(2), 139-153.
- Brem, A., Giones, F., & Werle, M. (2023). The AI digital revolution in innovation: A conceptual framework of artificial intelligence technologies for the management of innovation. *IEEE Transactions on Engineering Management*, 70(2), 770-776.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25-32.

Huang, M. H., Rust, R., & Maksimovic, V. (2019). The feeling economy: Managing in the next generation of artificial intelligence (AI). *California Management Review*, 61(4), 43-65.

Krakowski, S., Luger, J., & Raisch, S. (2023). Artificial intelligence and the changing sources of competitive advantage. *Strategic Management Journal*, 44(6), 1425–1452.

Rammer, C., Fernández, G. P., & Czarnitzki, D. (2022). Artificial intelligence and industrial innovation: Evidence from German firm-level data. *Research Policy*, 51(7), 104555.

Sultana, S., Akter, S., & Kyriazis, E. (2022). How data-driven innovation capability is shaping the future of market agility and competitive performance?. *Technological Forecasting and Social Change*, 174, 121260.

Sullivan, Y., & Wamba, S. F. (2024). Artificial intelligence and adaptive response to market changes: A strategy to enhance firm performance and innovation. *Journal of Business Research*, 174, 114500.

Verganti, R., Vendraminelli, L., & Iansiti, M. (2020). Innovation and design in the age of artificial intelligence. *Journal of Product Innovation Management*, 37(3), 212-227.

Yin, R., K. (2014). *Case study research design and methods* (5th ed.). Thousand Oaks, CA: Sage.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Rafael Toassi Crispim	Brazil	University of Sao Paulo	rafael.crispim@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Vincenzo Baglieri	Italy	SDA Bocconi School of Management	enzo.baglieri@sdabocconi.it
Eduardo Pinheiro Gondim de Vasconcellos	Brazil	University of Sao Paulo	epgdvasc@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Wysiwyg software: Lighting solutions for the stage space

TYPE: Original research.

TRACK: This is an excerpt from the master's research entitled Luminotechnical solutions for the scenic space: software as a tool for creating and operating light, developed in the Graduate Program in Architecture and Urbanism at the Federal University of Viçosa, which problematized the possibilities of adopting the tools provided by Wysiwyg, as well as their implications for creating and operating light. Thus, the field of research was the operation, use and manipulation of Wysiwyg and the object of study was the whole range of lighting solutions for the scenic space provided by the software. For this study, we considered stage lighting as a transformative element of space and an instrument of visibility and visuality, favoring discussion of form, use and appropriation of the built space of buildings and the city, technological solutions for buildings, production of built or urban space, evaluation of projects and evaluation of software, programs, apps and 3D modelers aimed at lighting in relation to built space with a scenic purpose: theater buildings, concert halls, galleries, scenographic environments, facades and their artistic applications.

PURPOSE: The aim of this study was to evaluate the viability and performance of the Wysiwyg project programming and preview software, from the Canadian company Cast Software, taking as a parameter the idea of technological innovation for lighting solutions in the Scenic Space.

DESIGN/METHODOLOGY/APPROACH: This was a qualitative, descriptive and exploratory study, organized as a Case Study entitled Single Incorporated Case. In this way, we present how the Wysiwyg software works, discussing its uses and potential, as well as its importance in the constitution of the Scenic Lighting language in lighting projects, which allowed us to establish parameters of analysis to verify and evaluate the potential and limits of the use of the Wysiwyg software in the elaboration of lighting projects for the built space with a scenic objective. Finally, we characterized the functioning and effectiveness of

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

the software analyzed.

FINDINGS OR EXPECTED OUTCOMES: This research set out to unveil the means of accessing products that have already been developed, as well as their better use and evaluation, effectively contributing to technological innovation, in line with the discussions of the group Science, Technology and Innovation Policies for the Humanities, Social Sciences and Applied Social Sciences, which in 2014 focused on the importance of innovation in research in the contemporary world, pointing to the degree of appropriation of scientific and technological advances and how to mobilize them in society.

ORIGINALITY/VALUE: This research is pertinent because it opens up a field for the development of software and solutions that reach the wider market, serving light designers, artists and architects, as well as any professionals who are interested in this area of activity, developing projects in various spaces such as theaters, facades, concert halls, galleries, public spaces, among others. We would like to point out that the development of stage lighting takes place with the evolution of technologies and through historical contexts, which enable different ways of using light and transforming scenic spaces and that the Wysiwyg software is new to the Brazilian job market, so professionals in the field are gradually discovering the software and adhering to the technologies. The purpose of this summary is to present part of the results of this study, which proposed an objective evaluation of Wysiwyg in order to simplify and democratize access to innovation in lighting solutions for the scenic space, with reference to software as a tool for creating and operating light.

PRACTICAL/SOCIAL IMPLICATIONS: This research has made it possible to reflect on the construction of the gaze and scenic visibility today, enabling and democratizing access to innovation in lighting solutions for the scenic space through the use of software as a tool for creating light, encouraging users to achieve autonomy as a work and research tool, whether in the area of Architecture and Urbanism or in the artistic community.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: During the course of the work, it was possible to see some limitations, as we realized the breadth of the software's resources and noted that the

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

research would not be able to evaluate the full range of lighting solutions in depth. If we analyzed each feature, we wouldn't be able to assess feasibility and performance in depth, as we wouldn't have time to go into them in depth. We have therefore concentrated on carrying out an initial analysis that paves the way for further studies to be carried out.

KEYWORDS (3-5): Scenic Space; Lighting Solutions; Visuality of the Scene; Wysiwyg.

REFERENCES

APPIA, A. A Obra de Arte Viva. Lisboa: Editora Arcádia, 3a edição, 2005.

ASSIS, R. C. A iluminação cênica como modificadora de espaços. Lorí Crízel + Partners Arquitetura, 2020. Disponível em: <https://www.loricrizel.arq.br/2179-2/?fbclid=IwAR3kqH5K7fjubIcGn4lrSTZzvrkzBJk1Vo7TFZaefvdlFQ1Xy2NthyNOYbI>. Acesso em: 23 mar.2023.

BARBOSA, C. V. T. Percepção da iluminação no espaço da arquitetura: preferências humanas de iluminação em ambientes de trabalho. Cláudia Verônica Torres Barbosa. São Paulo: FAU/USP, 2010.

BARDIN, L. A Análise de Conteúdo. São Paulo: edições 70, 2002.

CAST WYSIWYG. Disponível em: <https://cast-soft.com/wysiwyg-lighting-design/>. Acesso em: 15 set. 2022.

CNPq. Documento elaborado pelo Grupo de Trabalho do CNPq, PO-360/2014. Política de Ciência Tecnologia e Inovação para as áreas Ciências Humanas, Sociais e Sociais Aplicadas. Brasília, 2015. Disponível em: <https://www.almg.gov.br/export/sites/default/acompanhe/eventos/hotsites/2019/forum-tecnico-ciencia/documentos/material-de-referencia/01politica-cnpq.pdf>. Acesso em: 09 set. 2021.

GRAIG, E. G. Rumo a um novo teatro & cena. Tradução de Luiz Fernando Ramos. 1a ed. Editora

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

perspectiva, 2017.

NOSELLA, B. Por uma história do pensamento sobre o fazer da iluminação cênica moderna: a cena além do humano. Rev. Urdimento, Florianópolis, SC v.1, n.31, p.20-37, 2018. Disponível em: <https://doi.org/10.5965/1414573101312018020>. Acesso em: 21 abr. 2022.

PEREZ, V. Desenho de Iluminação de Palco: Pesquisa, Criação e Execução de Projetos. Dissertação (Mestrado em Multimeios) – Universidade Estadual de Campinas, 2007.

PEREZ, V. Dicas de iluminação cênica. s/d. Disponível em: <https://hosting.iar.unicamp.br/lab/luz/todasasdicas.pdf>. Acesso em 11 jul. 2022.

SCHMID, A. L. A idéia de conforto: reflexões sobre o ambiente construído. Curitiba: Pacto Ambiental, 2005.

SIMÕES, C. F. À linguagem da luz - A linguagem da Iluminação Cênica: de instrumento da visibilidade à 'Scriptura do Visível' (Primeiro recorte: do Fogo à Revolução Teatral). 2008. Orientador: Prof. Dr. Jacó Guinsburg. Dissertação (Mestrado) - Pós-Graduação em Artes Cênicas, Escola de Comunicações e Artes, Universidade de São Paulo, São Paulo. Disponível em <<https://repositorio.usp.br/item/001720848>>. Acesso em: 11 jul. 2022.

SIMÕES, C. F. À linguagem da luz - A linguagem da Iluminação Cênica: de instrumento da visibilidade à "Scriptura do Visível" & Outras poéticas da luz. 2013. Orientador: Prof. Dr. Jacó Guinsburg. Tese (Doutorado) - Pós-Graduação em Artes Cênicas, Escola de Comunicações e Artes, Universidade de São Paulo, São Paulo. Disponível em <<https://teses.usp.br/teses/disponiveis/27/27156/tde-18112013-155400/publico/CIBELEFORJAZSIMOES.pdf>>. Acesso em: 11 jul. 2022.

SOFTWARE Wysiwyg. Da ideia à Luz. YouTube, 12 jan. 2021. Disponível em: <https://www.youtube.com/watch?v=-plJh3aXuK8&t=242s>. Acesso em 06 nov. 2022.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

YIN, R. Estudo de Caso: Planejamento e Métodos - 2a Edição Porto Alegre: Bookman, 2001.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Thamiris Calegari Rodrigues	Brazil	Federal University of Viçosa	thamiris.rodrigues@ufv.br
Rosana Aparecida Pimenta	Brazil	Federal University of Viçosa	rosana.pimenta@ufv.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (minimum 500 words, maximum 1000 words)

TITLE: The innovation diplomacy and the integration of innovation ecosystems based on green hydrogen

TYPE: Research Design

TRACK: Disruptive Technologies and Sustainable Development

PURPOSE: The general objective of this research is to understand how Brazilian companies can use innovation diplomacy mechanisms to integrate with mature ecosystems based on the green hydrogen market. To this end, it was divided into the following specific objectives: 1) Understand the connection between innovation ecosystems, innovation diplomacy, and green innovation market through bibliography research; 2) Describe the main green hydrogen ecosystems in the world and the Brazilian one; 3) Identify the governance mechanisms of institutions promoting innovation diplomacy for companies; 4) Identify opportunities for Brazilian companies in the green hydrogen market to connect with mature green hydrogen ecosystems through innovation diplomacy. Understanding each of the constructs and their relationships allows for understanding the structure, and possibilities and verifying whether there is a connection between them and the governance mechanisms present in institutions focused on carrying out innovation diplomacy and whether there is applicability in green hydrogen ecosystems. All of this direction was created to answer the following research question: How can organizations participating in the green hydrogen ecosystem in Brazil accelerate their development through external partnerships?

DESIGN/METHODOLOGY/APPROACH: The conceptual basis is centered on open innovation and innovation networks/ecosystems, innovation diplomacy, and the hydrogen market. The methodological proposal was qualitative research, through an exploratory study. Data collection



took place through a bibliographical study in databases such as Scopus, Web of Science, and ANPAD. Furthermore, documentary research was carried out to understand the governance mechanisms in institutions promoting innovation diplomacy.

FINDINGS OR EXPECTED OUTCOMES: It is expected that there are innovation diplomacy mechanisms that can be used in the development of the green hydrogen market. However, they are still in the embryonic stages in terms of company participation and investments.

ORIGINALITY/VALUE: This research is original because it associates three distinct fields of literature such as open innovation, innovation ecosystems, and innovation diplomacy with a disruptive market linked to sustainability. It has value because it seeks to associate these mechanisms from different literatures to understand the panorama, the connections, and the possibilities that arise.

PRACTICAL/SOCIAL IMPLICATIONS: Understanding these mechanisms could lead to deeper connections between more advanced innovation ecosystems and Brazilian ones. It will allow us to intensify and improve the exchange of knowledge and resources with a focus on taking advantage of Brazil's scale and production potential. Therefore, it could bring economic and socio-environmental gains to the agents involved.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The limitation of this research is that it was carried out only with bibliographic and documentary analysis. This limitation represents future opportunities such as the application of qualitative and quantitative methods on the topic. Furthermore, due to the absence of other methods, it is exploratory and moving towards explanatory. However, there are greater possibilities for deepening by adding other techniques such as interviews with ecosystem orchestrators responsible for innovation diplomacy, and quantitative methods that allow exploring and connecting themes, promoting better integration.

KEYWORDS (3-5): open innovation; innovation ecosystems; innovation diplomacy; green hydrogen

market.

REFERENCES

- Aarikka-Stenroos, L., & Ritala, P. (2017). Network management in the era of ecosystems: Systematic review and management framework. *Industrial Marketing Management*, 67, 23–36.
- Adner, R., & Kapoor, R. (2010). Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations. *Strategic Management Journal*, 31(3), 306–333.
- Bogers, M., Chesbrough, H., & Moedas, C. (2018). Open Innovation: Research, Practices, and Policies. *California Management Review*, 60(2), 5–16.
- Bound, K. Innovating Together? The Age of Innovation Diplomacy. *The Global Innovation Index*, p. 91-95, 2016.
- Carayannis, E. G., & Campbell, D. F. J. (2009). “Mode 3” and “Quadruple Helix”: Toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management*, 46(3–4), 201–234.
- Colombelli, A; Paolucci, E; Ughetto, E. Hierarchical and relational governance and the life cycle of entrepreneurial ecosystems. *Small Business Economics*, v. 52, p. 505-521, 2019.
- Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Press.
- Chesbrough, H., & Prencipe, A. (2008). Networks of innovation and modularity: a dynamic perspective. *International Journal of Technology Management*, 42(4), 414.
- Dhanaraj, C., & Parkhe, A. (2006). Orchestrating Innovation Networks. *Academy of Management Review*, 31(3), 659–669.
- Gomes, L. A. D. V., Facin, A. L. F., Salerno, M. S., & Ikenami, R. K. (2018). Unpacking the innovation ecosystem construct: Evolution, gaps and trends. *Technological Forecasting and Social Change*, 136, 30–48.
- Grama-Vigouroux, S., Saidi, S., Uvarova, I., Cirule, I., & Sellami, M. (2024). Drivers and Barriers of



National Innovation Ecosystems for Implementing Sustainable Development Goals: A Latvian Case Study. *IEEE Transactions on Engineering Management*, 71, 4188–4204.

Griset, P. Innovation Diplomacy: A New Concept for Ancient Practices? *The Hague Journal of Diplomacy*, v. 15, 383-397.

Hurmelinna-Laukkanen, P., & Nätti, S. (2018). Orchestrator types, roles and capabilities – A framework for innovation networks. *Industrial Marketing Management*, 74, 65–78.

Klimas, P., & Czakon, W. (2022). Species in the wild: a typology of innovation ecosystems. *Review of Managerial Science*, 16(1), 249–282.

Leitjen, J. Exploring the future of innovation diplomacy. *European Journal of Future Research*, v. 5, 2017.

Pushpanathan, G., & Elmquist, M. (2022). Joining forces to create value: The emergence of an innovation ecosystem. *Technovation*, 115.

Thomas, L. D. W., & Autio, E. (2020). Innovation Ecosystems in Management: An Organizing Typology. In *Oxford Research Encyclopedia of Business and Management*. Oxford University Press.

Valkokari, K., Seppänen, M., Mäntylä, M., & Jylhä-Ollila, S. (2017). Orchestrating Innovation Ecosystems: A Qualitative Analysis of Ecosystem Positioning Strategies. *Technology Innovation Management Review*, 7(3), 12–24.

Weiss, C. Science, technology and international relations. *Technology in Society*, n. 27, p. 295-313, 2005.

Yang, Z., Chen, H., Du, L., Lin, C., & Lu, W. (2021). How does alliance-based government-university-industry foster cleantech innovation in a green innovation ecosystem? *Journal of Cleaner Production*, 283.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Victor Hugo José de Santana Rezende	Brazil	University of São Paulo (USP)	vhsantana@usp.br

XXII Triple Helix Conference – 2024

TITLE: Encapsulation of Pau Rosa Essential Oil in Cationic Liposomes: A Nanotechnological Approach for the Perfumery Industry

TYPE: Original Research

TRACK: Disruptive Technologies and Sustainable Development / Impact Innovation Strategies / Better Tomorrow: Engagement for Social and Environmental Impact

PURPOSE: This study investigates the encapsulation of Pau Rosa (*Aniba rosaeodora* Ducke) essential oil in cationic liposomes using nanotechnology, targeting the perfumery, hygiene, and cosmetic industries. It also introduces a technological platform capable of nanoencapsulating essential oils, enhancing product value, and supporting plant biodiversity protection.

DESIGN/METHODOLOGY/APPROACH: The study involved characterizing Pau Rosa (*Aniba rosaeodora* Ducke) essential oil, encapsulating it in cationic liposomes using different cationic surfactants, and evaluating the resulting nanoparticles' physicochemical properties. The formulation was applied to standardized hair strands for perfume durability and sensory assessment.

Characterization of Pau Rosa essential oil: The Pau Rosa essential oil was characterized by Gas Chromatography-Mass Spectrometry (GC-MS). This is an essential step to understanding its chemical composition, purity, and potential applications.

Nanoencapsulation process: Pau Rosa essential oil was nanoencapsulated in cationic liposomes.

Physicochemical characterization of the essential oil nanosystems: The nanoparticles were characterized by determining their size, Polydispersity Index (PDI), and zeta potential to provide insights into their surface charge. These measurements were done in a Zetasizer ZS90 (Malvern Panalytical).

pH evaluation: The pH of the formulation was assessed to ensure compatibility with the human skin and to prevent potential skin irritations.

Application on standardized hair tresses: The nanoparticles were applied to standardized hair tresses to evaluate the Pau Rosa's sensory properties, including durability, stickiness, shine, and fragrance retention. This step simulated real-world conditions and allowed for the assessment of whether the encapsulation technique prolonged the fragrance release. This test was developed to analyze one approach of this encapsulation technique, but it is not limited to the cosmetic field.

FINDINGS: The nanoparticles had an average size of 500 nm and a high polydispersity index (PdI), indicating a wide size distribution within the particle population. The presence of multiple particle sizes suggests the possibility of different compound release rates/profiles, which may contribute to prolonged fragrance release. The particles had a positive surface charge, as indicated by the zeta potential of 60 mV. For example, this charge may affect the interaction with hair fibers, leading to increased adhesion between the nanoparticles and fibers. The formulation effectively retained the pau rosa's essential oil fragrance, resulting in a pleasant odor. The durability of the fragrance was prolonged, indicating the efficacy of the liposome in protecting the essential oil from volatility and oxidation.

ORIGINALITY/VALUE: This research contributes through the innovative use of nanotechnology to overcome the volatility of essential oils, providing a sustainable solution for the fragrances industry and highlighting the biodiversity value of this Brazilian resource. This technology can be implemented to encapsulate different essential oils for attending numeral requirements of perfume, hygiene, and cosmetic industries.

PRACTICAL/SOCIAL IMPLICATIONS: The study has practical implications for the perfumery, hygiene, and cosmetic industries by introducing an innovative approach to enhance fragrance longevity in commercial products. Socially, it aligns with sustainable practices and supports certain Sustainable Development Goals (SDGs), promoting the use of natural resources like Pau Rosa essential oil. This not only contributes to biodiversity conservation but also encourages ethical supply practices, thereby

enhancing the value chain within these industries.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Future research should optimize the nanoencapsulation process and address the broad size distribution observed. The study is limited by its preliminary findings and requires further investigation for to reach commercial viability.

KEYWORDS: Nanoencapsulation; Industry Approach; Phytotechnology; Perfume Industry; Brazilian biodiversity.

REFERENCES

Gunawan, I., Daryono, B. S., Noviana, E., & Sulaiman, T. N. S. (2023). Nano-Perfumes as A Fragrance Carrier: Their Brief History, Essential Aspects, Development, Preparation Methods, Characteristics, and Future Perspectives. *Indonesian Journal of Pharmacy/Majalah Farmasi Indonesia*, 34(3).

Gunay, K. A., Berthier, D. L., Jerri, H. A., Benczédi, D., Klok, H., & Herrmann, A. (2017). Selective Peptide-Mediated Enhanced Deposition of Polymer Fragrance Delivery Systems on Human Hair. *ACS Appl. Mater. Interfaces*, 9(28), 24238-24249.

Manfredini, N., Ilare, J., Invernizzi, M., et al. (2020). Polymer Nanoparticles for the Release of Fragrances: How the Physicochemical Properties Influence the Adsorption on Textile and the Delivery of Limonene. *Ind. Eng. Chem. Res.*, 59(28), 12766-12773.

Nicolò, M., Juri, I., Marzio, I., Elisa, P., et al. (2020). Polymer Nanoparticles for the Release of Fragrances: How the Physicochemical Properties Influence the Adsorption on Textile and the Delivery of Limonene. *Ind. Eng. Chem. Res.*

Ponisseril, S., Soma, C., Namita, D., & Tamara, S. (2006). Nanoencapsulation for Extraction and Release of Fragrance. *Cosmetics & Toiletries*.

Teles, A. M., Silva-Silva, J. V., Fernandes, J. M. P., Calabrese, K. D. S., Abreu-Silva, A. L., Marinho, S.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

C., ... & Almeida-Souza, F. (2020). *Aniba rosaeodora* (Var. amazonica Ducke) essential oil: Chemical composition, antibacterial, antioxidant and antitrypanosomal activity. *Antibiotics*, 10(1), 24.

Zhang, S., & Ye, T. (2022). Preparation of Natural Composite Microcapsules Containing Orchid Black Currant Fragrance and its Sustained-Release Properties on Hair Bundle. *J. Polym. Environ.*, 30(1), 136-150.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Letícia Kakuda	Brazil	School of Pharmaceutical Sciences of Ribeirão Preto of University of São Paulo	leticiakakuda@gmail.com /leticia.kakuda@usp.br
Gabriela Alberto Gil			gabi.gil@usp.br
Grazielly Ismail Licco			g.licco@usp.br
Patrícia Maria Berardo Gonçalves Maia Campos			pmcampos@usp.br
Wanderley Pereira de Oliveira			wpoliv@usp.br



XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: *Artificial Intelligence and Decision Making*

TYPE: *practical case / experience analysis*

TRACK: *Disruptive Technologies and Sustainable Development*

(Indicate one Track described in the Call for Abstracts, pages 4 and 5:
<https://triplehelixconferencebrazil.com/wp-content/uploads/2024/03/call-for-abstracts-THC2024-v20240304.pdf>)

PURPOSE: *Explore the implications of Artificial Intelligence on the Commitment process during Decision Making in Organizations.*

DESIGN/METHODOLOGY/APPROACH: *Essay: Review of Commitment Based Behavior and Trust Theories and Review of Artificial Intelligence (AI) history and mechanics. Reflection on the interaction between both vis a vis, the theories, authors experience and case analysis to understand whether AI can influence and or even take part of the decision making process based on commitments.*

FINDINGS OR EXPECTED OUTCOMES: *AI can strongly influence commitments to actions in humans especially to be perceived as a thickening agent. Decision making processes could be impacted by data and algorithm biases . AI could support decision makers to find main points of disagreements and convergence, speeding the alignment and commitment process. The outcomes of the essay can be of 2 types: Conclusions if necessary evidence is found, or hypothesis for further research.*

ORIGINALITY/VALUE: *The specific analysis of AI and Commitments in the context of decision making in organizations. Exploration of the extent to which AI can influence the human ability to make commitments and whether humans can commit to machines powered by AI.*

PRACTICAL/SOCIAL IMPLICATIONS: *Identify hurdles, challenges and opportunities in the future of work based on more interactions among Artificial Intelligence and Human Beings on the decision process.*

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: *The essay highlights some hypothesis that can be used as the basis for experiments to seek evidence of influence of AI in decision making processes based on commitments, with control for statistical relevance of the behaviors observed with subjects under study.*

KEYWORDS (3-5)

1. Artificial Intelligence
2. Organization Development
3. Commitment Based Management
4. Speech Acts

REFERENCES

- Kandel, Eric R. - In Search of Memory – The Emergence of a New Science of Mind - 2006 - W. W. Norton & Company.
- Nicolelis, Miguel - Beyond Boundaries: The New Neuroscience of Connecting Brains with Machines - And How It Will Change Our Lives - 2012 - St. Martins Press-3PL.
- Pinker, Stephen - How the mind works - 2009 - W. W. Norton & Company.
- Sapolsky, Robert M. - Behave: The Biology of Humans at Our Best and Worst - 2017 - Penguin Books.
- Solomon, Robert C. and Flores, Fernando - Building Trust: In Business, Politics, Relationships, And Life, 2002 - Oxford University Press.
- Sull, Donald N. and Spinosa, Charles - Promise-Based Management, 2007 - Harvard Business Review - Harvard Business School Publishing.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Azevedo, Tadeu	Brazil	FEA/USP	tadeu.azevedo@usp.br
Monardez, Ricardo	USA	The Taligens Group	ricardo.monardez@taligens.com
Del Rey, Alexandre	Brazil	I2AI / FIA	alexandred@fia.com.br

ABSTRACT

The study of organizations has traditionally relied on various theories to explain how people make decisions and commit to actions within an organization. These theories, such as Speech Act Theory and Commitment-based Management, emphasize the role of human intention and agency in shaping organizational behavior. However, the advent of artificial intelligence (AI) is transforming the landscape of human communication and interaction, with significant implications for how these theories are applied in organizational settings.

This essay explores the impact of AI on Speech Acts and Commitment-based Management within organizations. Speech acts are defined as the ways in which language is used to perform actions, such as issuing commands, making requests, or conveying intentions. Commitment-based Management, on the other hand, is a theory that emphasizes the importance of clear and consistent communication in establishing and maintaining commitments within organizations, in the pursuit of effective action and organizational results (regardless of the nature of the enterprise).

The essay argues that AI is having a profound impact on both Speech Acts and Commitment-based Management in several ways. First, the rise of large language models (LLMs) like GPT-3, ChatGPT, and Gemini is creating new possibilities for human-machine interaction. These models are trained on massive amounts of data and are able to generate human-like text, translate languages, write different kinds of creative content, and answer questions in an informative way. However, as the essay points out, LLMs can also generate data without regard for the truth, information that is biased or misleading; which can have a negative impact on decision-making within organizations.

Second, AI can be used to analyze human communication patterns and identify emotional cues. This information can then be used to personalize interactions, target advertising, or even manipulate people's behavior. The essay argues that this raises a number of ethical concerns, as it could lead to unfair or deceptive practices within organizations. Some internal organizational processes such as performance management and career development could be negatively affected by this type of AI interaction, as organizational leaders' opinions on other individuals' performance or potential might be influenced one way or another.

Third, AI is increasingly being used to automate decision-making processes. While this can lead to increased efficiency and productivity, it also raises concerns about transparency and accountability. If AI is used to make decisions that have a significant impact on people's lives, it is essential that there are mechanisms in place to ensure that these decisions are fair, just, and explainable.

Fourth, Human brain has been selected over time with certain capacities related to survival. The brain is very adaptive as we go through life based on the experiences we are subjected to. To what extent do we want to condition our brain not to participate actively in the decision making process?

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

The essay concludes that the rise of AI is fundamentally changing the way we communicate and interact with each other, by calling for a critical examination of the role of AI in organizations. It emphasizes the need to develop ethical guidelines and best practices to ensure that AI is used in a responsible and beneficial way. Additionally, the essay highlights the importance of ongoing research to better understand the potential impact of AI on human communication, decision-making, and commitment within organizations.

04

Better Tomorrow-Engagement for Social and Environmental Impact



XXII Triple Helix Conference – 2024

TITLE: Institutional void and guardians of the pirarucu in the Amazon.

TYPE: a. original research.

TRACK: 4. Better Tomorrow: Engagement for Social and Environmental Impact.

PURPOSE:

Fishing has always been a natural vocation of Amazonian populations, playing a vital role in providing not only an essential source of protein but also fulfilling a fundamental function in preserving culture and sustaining local communities (Veríssimo, 1895). Among the species consumed and traded, the pirarucu (*Arapaima gigas*) stands out as central to the subsistence of local communities and the preservation of biodiversity. This species, found in freshwater, is one of the largest in the world, capable of reaching three meters in length and weighing around 200 kg (Castello et al., 2009).

This paper discusses the dilemma of illegal pirarucu fishing in the Brazilian Amazon, emphasizing the role played by local communities in protecting the lakes and the consequent preservation of the species. Illegal fishing is a widespread practice in the region, and in the absence of an active State, the result is that the vast majority of pirarucus caught and sold in local markets come from indiscriminate fishing. This research addresses the institutional gap left by the state, which places a significant burden on the traditional communities involved in managed pirarucu fishing. These communities take on the responsibility of monitoring the lakes and the costs associated with this activity. These costs go beyond the monetary aspect and involve a social cost of time and exposure to life risks.

DESIGN/METHODOLOGY/APPROACH:

The methodology approach used in this research is based on documentary research and data collection through interviews with local actors and institutions, we address the pioneering example of sustainable pirarucu management in the Mamirauá Sustainable Development Reserve (RDSM), highlighting the



contribution of communities to the conservation of the species, the forest, and the local culture.

FINDINGS OR EXPECTED OUTCOMES:

The positive externalities resulting from managed fishing, especially regarding lake monitoring, need to be rewarded so that the burden of surveillance does not become a restrictive factor to income generation and increased well-being of local populations.

ORIGINALITY/VALUE:

Illegal, unreported, and unregulated fishing is a global concern that affects both marine and freshwater fishing (Shalehin, 2022). In the northern region of Brazil, the situation has worsened significantly in recent years. According to the Cartography of Violence in the Amazon (2022), in the states of Amazonas, illegal fishing and drug trafficking result in lethal violence rates above the national average. Pirarucu is one of the species most targeted by the illegal market, and the sale of this fish has also served as a means of money laundering for organized crime and drug trafficking (Rölke, 2022). This paper sheds light on this issue and proposes strengthening the actions carried out by communities in pirarucu management to contribute to solving this problem.

PRACTICAL/SOCIAL IMPLICATIONS:

The preservation of biodiversity is not solely the concern of local communities but rather a common good that benefits society. The environmental services provided by reserve areas have substantial economic value and contribute to the production of food, clean water, and fresh air, benefits that extend far beyond the borders of management communities. In this context, it would be fair for society to share the costs of preservation, recognizing the intrinsic value of these protected areas. By doing so, not only would the continuity of conservation efforts be ensured, but also a sustainable future for future generations would be promoted.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

The lack of precise data on fines and infractions recorded for indiscriminate fishing in the Amazon region makes it difficult to conduct a more robust analysis of the real impact of illegal activity on the local economy and the lives of people who rely on fishing in the region. Additionally, the scarcity of data on the costs associated with surveillance makes it challenging to estimate the representativeness of this activity for management. These issues have limited the analyses proposed in this research. Therefore, future studies can be undertaken to maintain systematic and consistent data collection in the region, to provide evidence for the implementation of concrete actions and the formulation of public policies that contribute to addressing this issue.

KEYWORDS (3-5)

Institutional void, illegal fishing, pirarucu, Amazon rainforest.

REFERENCES

Cartografias da violência na Amazônia. São Paulo: Fórum Brasileiro de Segurança Pública, v. 2, 2023. ISBN: 978-65-89596-33-2, versão online. https://forumseguranca.org.br/publicacoes_posts/cartografias-da-violencia-na-amazonia-2a-edicao/. Ace.

Castello, L., Viana, J. P., & Pinedo-Vasquez, M. (2011). Participatory conservation and local knowledge in the Amazon várzea: the pirarucu management scheme in Mamirauá. In *The Amazon Várzea* (pp. 259-273). Springer, Dordrecht. Dordrecht. https://doi.org/10.1007/978-94-007-0146-5_18

Rölke, G. (2022). Lucro e morte na pesca ilegal do pirarucu. *IstoÉ Dinheiro*, 19 de junho de 2022. <https://istoe.com.br/a-mafia-do-pirarucu/>

Shalehin, M. S., Parvez, M. T., Lucas, M. C., & Galib, S. M. (2022). A case study of illegal fishing causes during seasonal fishery closure in Kaptai Lake, Bangladesh. *Fisheries Management and Ecology*, 29(5), 542-551. <https://doi.org/10.1111/fme.12536>

Veríssimo, J. *A pesca na Amazônia*. Rio de Janeiro: Livraria Clássica de Alves, 1985.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Maria Sylvia Macchione Saes	Brazil	Universidade de São Paulo (USP)	ssaes@usp.br
Elis Regina Monte Feitosa	Brazil	Universidade de São Paulo (USP)	elismf@usp.br
Alexsandra Bezerra da Rocha	Brazil	Universidade Federal de Campina Grande (UFCG)	alexsandra.bezerra@professor.ufcg.edu.br
James Douglas Oliveira Bessa	Brazil	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Ibama)	jdobessa@gmail.com jdobessa@gmail.com



XXII Triple Helix Conference – 2024

TITLE: Triple helix & innovation: a study in a context of mining-dependence

TYPE: Research paper

TRACK: 04

PURPOSE: Our paper discusses the cross-sector partnership (Selsky & Parker, 2005) between a public university, a mining corporation, and the local government in Itabira, Minas Gerais, Brazil. The municipality has a strong dependence on the extractive industry for local development, known as “Mining-Dependence” (Araoz, 2020). To minimize negative impacts on the territories, companies adopt Corporate Social Responsibility [CSR]. However, extractive companies often use CSR as a profitable strategy, with their primary objective being to gain a competitive advantage (Banerjee, 2008).

The Entrepreneurial Ecosystem [EE] approach has recently gained attention from researchers and political groups seeking to develop their economies (Spigel, 2015). Universities play a crucial role in EEs by providing infrastructure, knowledge, and connections to entrepreneurs (Spigel, 2015). To integrate with regional entrepreneurial dynamics, a university must interact with other actors (Etzkowitz & Zhou, 2017). This generates an “entrepreneurial university” that expands its teaching and research missions, transfers knowledge, and collaborates with its surrounding community.

Universities can establish stronger relationships with the external community and develop social and environmental innovations (Thomas & Pugh, 2020). This would allow universities to become more than just entrepreneurial entities, but also engaged members of society, contributing beyond economic precepts (Thomas & Pugh, 2020) to develop socio-environmental innovations (Carayannis & Rakhmatullin, 2014).

DESIGN/METHODOLOGY/APPROACH: The study employed a qualitative approach, applying the single case study method. This method is based on an extreme or decisive case (Yin, 2005), which in this case is the city of Itabira, located in the State of Minas Gerais, Brazil. Itabira is the birthplace of one of the

largest mining companies in the world and has become a mining-dependent territory. The society of Itabira is facing the imminent depletion of its mineral resources, which is predicted to occur by 2040. In response, the city is striving to achieve economic dynamism before this deadline. Currently, the model for achieving dynamism is focused on the establishment of university campuses affiliated with a well-regarded federal university. Data was collected through news articles, documents, and in-depth interviews with representatives of civil society in the city of Itabira. The sources for this information were the web pages of the City Hall and the university.

FINDINGS OR EXPECTED OUTCOMES: The content analysis showed that there seems to be no continuity in the implementation of projects aimed at boosting the economy of the city of Itabira. Additionally, interviewees reported that projects linked to the University occur sporadically and are not aligned with the local reality. Community projects, such as those held on commemorative dates, also appear disconnected from the community's needs. The benefits of these themes are not clear to the community.

There are strong ties between public authorities, the university, and commercial associations regarding diversification projects based on entrepreneurship. The interests in allocating the campus are focused on the development of Industry 4.0, training specialized engineers, creating a technological park, and state-of-the-art laboratories. However, the campus insertion project is still under development and has not yet met the goal of serving students. Additionally, some equipment is currently not in use and the mining company is taking advantage of its functionality. The University appears to be disconnected from the community's problems, which suggests that although innovative, it is not fully engaged (Thomas & Pugh, 2020).

ORIGINALITY/VALUE: The study aims to contribute to the current and relevant debate on territories by demonstrating the performance of actors in the triple helix and their efforts to promote economic growth in a region marked by a dependence on mining. The role of an entrepreneurial university is essential for promoting entrepreneurial activity and subsequent economic development in the context of an economic, social, and environmental crisis. This theme has been little documented in the literature (Thomas & Pugh,

2020).

PRACTICAL/SOCIAL IMPLICATIONS: The study highlights the importance of the active participation of the most vulnerable populations in the territories so that their livelihoods are made viable and not co-opted. It is argued that increasing the revenue of another productive sector alone will not overcome mining-dependency. Instead, it is necessary to enhance the work capacities of the populations affected by mining.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Although this is a contextualized study, it did not include aspects specific to the municipality under study, such as cultural factors intrinsic to the territory. Conducting the study was challenging due to the absence of historical and specific socio-economic data. As a recommendation for future research, it is suggested to investigate the impact of universities in mining-dependent territories based on indicators relevant to municipal financial sustainability. These indicators may include the number of jobs generated, the number of companies created, direct taxes generated, and direct revenue generated.

KEYWORDS: Mining-Dependency; Corporate Social Responsibility; Entrepreneurship; Development

REFERENCES

Araóz, Horacio Machado. (2020) *Mineração, genealogia do desastre: o extrativismo na América como origem da modernidade*. São Paulo: Elefante. 324 p.

Banerjee, S. B. (2008). Corporate Social Responsibility: The good, the Bad and the Ugly. *Critical Sociology*. 34(1) 51-79.

Carayannis, E. G.; & Rakhmatullin, R. (2014). The quadruple/quintuple innovation helixes and smart specialisation strategies for sustainable and inclusive growth in europe and beyond. *Journal of Knowledge Economy*, 1-28



Etzkowitz, H.; Zhou, C. (2017). Hélice tríplice: inovação e empreendedorismo universidade-indústria-governo. Estudos Avançados, 31(90), 23-48.

Selsky, J. W.; Parker, B. (2005) Cross-Sector Partnerships to Address Social Issues: Challenges to Theory and Practice. Journal of Management, 31(6):849-873.

Spigel, B. (2015). The relational organization of entrepreneurial ecosystems. Entrepreneurship theory and practice, 41(1), 49-72.

Thomas, E.; Pugh, E. (2020). From ‘entrepreneurial’ to ‘engaged’ universities: social innovation for regional development in the Global South. Regional Studies, 1-14.

Yin, R., K. (2005). Projetando estudos de caso. In Yin (2005), Estudo de caso: planejamento e método (p. 39-79). Porto Alegre: Bookman

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Frederico Dornellas Martins Quintão	Brazil	Pontifical Catholic University of Minas Gerais – PUC Minas	fredericodmq@gmail.com
João Paulo Moreira Silva	Brazil	PUC Minas	joao.msilva@live.com
Armindo dos Santos de Sousa Teodósio	Brazil	PUC Minas	armindo.teodosio@gmail.com



XXII Triple Helix Conference – 2024

TITLE: Innovative Lipid Nanosystems Loaded with Pepper Rosemary Essential Oil for Combating Fungal Infections

TYPE: Original research

TRACK: Better Tomorrow: Engagement for Social and Environmental Impact / Disruptive Technologies and Sustainable Development

PURPOSE: This study aimed to characterize, encapsulate in nanoparticles, and assess the antifungal activity of the *Lippia origanoides* Kunth, commonly known as pepper rosemary, essential oil (EO) against *Candida* spp.

DESIGN/METHODOLOGY/APPROACH: The essential oil (EO, SisGen: A452930) was characterized by Gas Chromatography-Mass Spectrometry (GC-MS) before being encapsulated in Nanostructured Lipid Carriers (NLCs). NLCs were formulated using either pure Poloxamer 407 (F1) or a combination with Cetyltrimethylammonium Bromide (CTAB - F2) as a surfactant. Furthermore, formulations were prepared with the EO (F1-EO and F2-EO), with isolated thymol (F1-T and F2-T), or without active ingredients (F1-B and F2-B). For the stability tests, the NLCs' pH, particle size, polydispersity index (PdI), and zeta potential were monitored over a 28-day period. Minimum Inhibitory Concentration (MIC) values were determined against *Candida albicans*, *Candida auris*, and *Candida parapsilosis*.

FINDINGS OR EXPECTED OUTCOMES: The results exhibited both the stability of the NLCs and the potent antifungal efficacy of the EO and the NLCs against the three assessed fungus species. This activity is attributed to the thymol content in the EO, which disrupts fungal cell membranes, leading to cellular death. Additionally, a synergism effect was observed between CTAB and the compounds present in the EO, potentially enhancing permeation through fungal membranes. Hence, both pepper rosemary EO and the developed NLCs demonstrated promising potential as phytopharmaceutical agents for topical formulations in the treatment of superficial candidiasis.

ORIGINALITY/VALUE: Pepper rosemary is a native plant of Brazilian Northeast, particularly in semi-arid regions, and is listed among the plant species of RENISUS (National List of Medicinal Plants of Interest to the Unified Health System, Brazil). Despite its potential, the complex composition of EO has made its application in its native form challenging, leading to the volatilization or oxidation of compounds, as well as skin sensitization and systemic intoxication if misused. Given this, the use of nanoencapsulation processes can contribute to solving several of these limitations, as well as promoting sustained release, improving stability and bioactivity, and allowing incorporation into stable, safe, and effective topical formulations to treat resistant fungi.

PRACTICAL/SOCIAL IMPLICATIONS: In the last few decades, fungal infections have become more recurrent, affecting over 1 billion people yearly, with 150 million severe cases and 1.7 million fatal. Similarly, superficial fungal infections caused by *Candida* spp. have become significantly common in patients with predisposing factors - including age, pregnancy, immune function disorders, immunosuppressive or antibiotic chemotherapy, and chronic diseases - potentially progressing to systemic infections and septicemia. The high infection potential is related to their ability to form biofilms, contributing to an increase in drug resistance by up to 1000 times. Despite the potential risk, fungal pathologies have been underestimated and neglected by healthcare authorities, contributing to resistance to available antifungals and the difficulty of treatment. In this context, the EO has been gaining prominence due to its combination of antifungal mechanisms of action, minimizing the possibility of resistance, and representing a significant alternative to traditional antifungals.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Given that the proposal aims to develop a topical formulation, it is imperative to pursue further studies using in vivo models to validate both efficacy and safety.

KEYWORDS: Nanotechnology; Microbiological Resistance; Brazilian Biodiversity; Essential Oil; Fungus.

REFERENCES

CIMINO, C. *et al.* Essential oils: Pharmaceutical applications and encapsulation strategies into lipid-based delivery systems. **Pharmaceutics**, v. 13, n. 3, p. 327, 2021.

CORTES-ROJAS, D. F.; OLIVEIRA, W. P. Physicochemical properties of phytopharmaceutical preparations as affected by drying methods and carriers. **Drying Technology**, v. 30, n. 9, p. 921-934, 2012.

COSTA, R.; SANTOS, L. Delivery systems for cosmetics-From manufacturing to the skin of natural antioxidants. **Powder Technology**, v. 322, p. 402-416, 2017.

HARRIS, R. Progress with superficial mycoses using essential oils. **International Journal of Aromatherapy**, v. 12, n. 2, p. 83-91, 2002.

HAY, R. Therapy of skin, hair and nail fungal infections. **Journal of Fungi**, v. 4, n. 3, p. 99, 2018.

HAY, R. J. Superficial mycoses. In: **Hunter's Tropical Medicine and Emerging Infectious Diseases**. Elsevier, p. 648-652, 2020

KAINZ, K. *et al.* Fungal infections in humans: the silent crisis. **Microbial Cell**, v. 7, n. 6, p. 143, 2020.

PRISTOV, K. E.; GHANNOUM, M. A. Resistance of *Candida* to azoles and echinocandins worldwide. **Clinical Microbiology and Infection**, v. 25, n. 7, p. 792-798, 2019.

WISPLINGHOFF, H. *et al.* Nosocomial bloodstream infections in US hospitals: analysis of 24,179 cases from a prospective nationwide surveillance study. **Clinical infectious diseases**, v. 39, n. 3, p. 309-317, 2004.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Wanderley Pereira de Oliveira	Brazil	School of Pharmaceutical Sciences of Ribeirão Preto of University of	wpoliv@usp.br / wpoliv@gmail.com
Gabriela Alberto Gil			gabi.gil@usp.br
Letícia Kakuda			leticia.kakuda@usp.br
Ludmilla Tonani Carvalho			ludtonani@hotmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Marcia Regina von Zeska
Kress

São Paulo

kress@fcfrp.usp.br



XXII Triple Helix Conference – 2024

TITLE: The protection of intellectual property rights in the Legal Framework for Innovation

TYPE: Original research

TRACK: 4

PURPOSE: The aim of this research is to analyze the role of protecting intellectual property rights within the scope of the Legal Framework for Innovation. To this end, we investigated the main provisions of the law that deal with the subject, as well as the implications of these regulations for innovation and national technological development. In this way, we aim to provide a comprehensive understanding of the subject, demonstrating the potential of the Legal Framework to promote an environment conducive to the creation, protection and transfer of technology in Brazil. Therefore, this research is justified by the investigative exploration of the subject and the need to foster debate on the protection of intellectual property rights in the context of the National Innovation System. In this sense, it is hoped that the research will contribute to a critical reflection on current legislation and to the proposal of measures that can improve the protection of intellectual property rights and stimulate innovation in the country.

DESIGN/METHODOLOGY/APPROACH: The research was carried out using a qualitative approach, seeking to understand and analyze in depth the issues related to the protection of intellectual property rights within the legal framework for innovation in Brazil. Data was collected through a literature review and documentary analysis. The literature review covered academic studies, scientific articles, relevant legislation, government documents and technical reports related to the protection of intellectual property rights and the legal framework for innovation in Brazil. Documentary analysis was carried out to examine current legislation on innovation and intellectual property in Brazil, including the Legal Framework for Innovation, the Technological Innovation Law and the Industrial Property Law. The data collected was analyzed using qualitative analysis techniques: content analysis and data triangulation. The data analysis sought to identify patterns, trends, challenges and opportunities related to the protection of intellectual property rights in the legal framework for innovation in Brazil.

FINDINGS OR EXPECTED OUTCOMES: Throughout our investigation, we have come to understand that the Legal Framework for Innovation aims to foster the protection of intellectual property rights to stimulate knowledge generation and technology transfer among research institutions, businesses, and society. Upon analyzing the current legislation and innovation policies, we have found that the protection of intellectual property rights within the legal framework provides legal certainty to researchers, incentivizing investments in research and development (R&D). Additionally, this protection enables the formation of strategic partnerships between public and private institutions, driving technology transfer and the commercialization of innovative products and services. However, our research has also highlighted challenges to be overcome in the protection of intellectual property rights, such as the need for agility in registration processes and raising awareness of the importance of protection among researchers and entrepreneurs. It is crucial to promote the dissemination of knowledge about intellectual property, encouraging education and training in this area. In summary, mechanisms for the protection and defense of intellectual property rights play an essential role in safeguarding the interests of inventors, driving innovation, knowledge dissemination, and enhancing competitiveness. Through registration systems, patent granting, enforcement of laws, monitoring, international efforts, and legal actions, efforts are made to ensure the exclusivity, valorization, and adequate protection of intellectual creations. These mechanisms contribute to promoting technical and scientific progress, stimulating creativity, collaboration, and socioeconomic development. Thus, we conclude that the protection of intellectual property rights within the legal framework plays a strategic role in promoting innovation in Brazil. By ensuring the legal protection of inventions, we stimulate research and development, technology transfer, and collaboration among different sectors of society. In doing so, by creating an environment conducive to innovation, we encourage the formulation of public policies in the sector, financial incentives, and legal security for intellectual property, thereby driving national development and positioning Brazil at the forefront of technological advancement.

PRACTICAL/SOCIAL IMPLICATIONS: In Brazil, the legal framework for innovation has established modern legislation, laying the legal foundations and encouraging innovation and technology transfer between public and private institutions. In this context, given the conditions of the contemporary capitalist

market, we believe it is essential, especially at the present time, to investigate how the protection of intellectual property rights is being dealt with in this legislation, in order to provide the legal certainty appropriate to a dynamic innovative process. In this sense, our study seeks to present and educate interested parties on how the rules outlined in the law can contribute to the creation of an innovation ecosystem conducive to the protection of R&D investments. In addition, we present the challenges and opportunities related to the protection of intellectual property rights in the legislative context, both from the perspective of companies and research institutions, in order to guide strategic actions for greater effectiveness in our national innovation system.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: At the initial stage of the study, we were faced with the question of how these instruments would be implemented in other countries, especially those considered developed. For this reason, we recommend carrying out a comparative analysis between the Brazilian legal framework for innovation and the legal systems of other countries, highlighting similarities, differences and best practices in relation to the protection of intellectual property rights. In addition to the aspect of research from a comparative perspective, we also suggest the need for research aimed at demonstrating the economic impact of the effective protection of intellectual property rights in Brazil, analyzing their role in promoting economic growth, generating jobs and stimulating investment in research and development.

KEYWORDS: Legal framework for innovation, Intellectual property, Innovation law, National innovation system

REFERENCES

ASSOCIAÇÃO NACIONAL DE PESQUISA E DESENVOLVIMENTO DAS EMPRESAS INOVADORAS (ANPEI). Mapa do Sistema de Inovação Brasileiro. MAPSE: São Paulo, 2014.

BALBACHEVSKY, E. **Entraves e incentivos para o desenvolvimento de sinergias entre universidade e sociedade na produção do conhecimento: a experiência da América Latina**. 34º Encontro Anual da Associação Nacional de Pós-Graduação em Ciências Sociais – ANPOCS, Caxambu, MG, 2010.

BITTENCOURT, P.; CARIO, S. **O conceito de sistema nacional de inovação: das raízes históricas à análise global contemporânea.** ENCONTRO NACIONAL DE ECONOMIA POLÍTICA, XXI, 2016.

BRASIL. Lei nº 13.243, de 11 de janeiro de 2016. **Dispõe sobre estímulos ao desenvolvimento científico, à pesquisa, à capacitação científica e tecnológica e à inovação.** Brasília, DF, 2016.

BRASIL. Lei nº 11.196, de 21 de novembro de 2005. **Institui o Regime Especial de Tributação para a Plataforma de Exportação de Serviços de Tecnologia da Informação - REPES, o Regime Especial de Aquisição de Bens de Capital para Empresas Exportadoras - RECAP e o Programa de Inclusão Digital.** República Federativa do Brasil, Brasília, DF, 22 nov. 2005.

BRASIL. Lei nº 13.786, de 27 de dezembro de 2018. **Altera a Lei nº 12.965, de 23 de abril de 2014 (Marco Civil da Internet), para prever a proteção dos dados pessoais dos usuários de serviços da internet no Brasil.** República Federativa do Brasil, Brasília, DF, 28 dez. 2018.

BRASIL. Lei nº 9.279, de 14 de maio de 1996. **Regula direitos e obrigações relativos à propriedade industrial.** República Federativa do Brasil, Brasília, DF, 15 mai. 1996.

BRASIL. Lei nº 9.610, de 19 de fevereiro de 1998. **Altera, atualiza e consolida a legislação sobre direitos autorais e dá outras providências.** República Federativa do Brasil, Brasília, DF, 20 fev. 1998.

BOURDIEU, P. *Les Structures sociales de l'économie.* Paris: Seuil, 2000.

BARBOSA, Denis Borges, **Uma Introdução à Propriedade Intelectual.** 2ª Edição. Rio de Janeiro: Editora Lúmen Júris, 2003

COELHO, Fabio Ulhoa. **Manual de direito comercial.** 18. ed. São Paulo: Saraiva, 2007.

COSTA, Achyles Barcelos da. **TEORIA ECONÔMICA E POLÍTICA DE INOVAÇÃO.** Revista de Economia Contemporânea, [S.L.], v. 20, n. 2, p. 281-307, ago. 2016. FapUNIFESP (SciELO). <http://dx.doi.org/10.1590/198055272024>.

DAGNINO, R. **A tecnologia social e seus desafios.** In: Tecnologia social: uma estratégia para o desenvolvimento. Rio de Janeiro: Fundação Banco do Brasil, 2004.

FREEMAN, Christoph; SOETE, Luc. **A economia da inovação industrial.** Editora da UNICAMP, 2008.

FREEMAN, Christoph. **Technology policy and economic performance.** Londres: Pinter Publishers London and New York, 1987.

IPEA. **Avaliação das Políticas de Incentivo à P&D e Inovação Tecnológica no Brasil: Nota Técnica.** Autores: João Alberto De Negri e Mauro Borges Lemos. Brasília, 2008.

Jungmann, D. M. **A caminho da inovação: proteção e negócios com bens de propriedade intelectual: guia para o empresário** /Diana de Mello Jungmann, Esther Aquemi Bonetti. – Brasília: IEL, 2010. 125 p.: il. ISBN 978-85-87257-49-9.

JABBOUR, Elias. **O marxismo e outras influências sobre o pensamento de Ignacio Rangel.** Economia e Sociedade, [S.L.], v. 26, n. 3, p. 561-583, dez. 2017. FapUNIFESP (SciELO).

<http://dx.doi.org/10.1590/1982-3533.2017v26n3art2>.

LUNDVALL, Bengt-ake. **National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning.** London: Pinter, 1992.

MARX, K. **O Capital: crítica da economia política.** Coleção Os Economistas. V. I (Tomos 1 e 2). São Paulo: Abril Cultural, [1867]1983/1984.

MARX, K.; ENGELS, F. **Manifesto Comunista.** São Paulo: Boitempo, [1848]2010.

MARX, K. **Miseria de la Filosofia.** Buenos Aires: Siglo Veintiuno Argentina Editores, [1847]1974.

MAZZUCATO, M. **O estado empreendedor: desmascarando o mito do setor público vs. setor privado.** São Paulo: Portfolio-Penguin, 2014.

MARSHALL, A. **Princípios de Economia. vol 1.** São Paulo: Nova Cultural, 1985.

MONTEIRO, Plínio Rafael Reis. **Você já ouviu falar do modelo de tripla hélice para inovação?** Dissertação (Mestrado) - Universidade Federal de Minas Gerais.2017.

NELSON, Richard R.; ROSENBERG, Nathan. **Technical innovation and national systems. National innovation systems: A comparative analysis**, v. 322, 1993.

NOVAES, H. T. DIAS, R. B. **Construção do marco analítico-conceitual da Tecnologia Social.** In: Dagnino, R. (Org). Tecnologia social: ferramenta para construir outra sociedade. 2. ed. Campinas, SP: Komedi, 2010.

NOVAES, Henrique T.; DIAS, Rafael. **Contribuições ao Marco Analítico-Conceitual da Tecnologia Social.** In: DAGNINO, Renato (Org.). Tecnologia Social: Ferramenta para construir outra sociedade. Campinas/ SP: IG / UNICAMP, 2009.

OCDE. **Manual de Oslo: Diretrizes para Coleta e Interpretação de Dados sobre Inovação.** 3. ed. Paris: OCDE, 2005.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

PAIVA, Vanilda. Sobre o conceito de. **Cadernos de Pesquisa**, [S.L.], n. 113, p. 185-191, jul. 2001. FapUNIFESP (SciELO). <http://dx.doi.org/10.1590/s0100-15742001000200010>.

PALUMA, Thiago; TEIXEIRA, Eline Débora. **O marco legal da inovação e o aumento da interação entre universidade e empresa: contribuições para a consolidação do direito fundamental ao desenvolvimento**. Rev. Bras. Polít. Públicas, Brasília, v. 9, n. 1 p.351-370, 2019

RAMOS, André Luiz Santa Cruz. **Direito Empresarial Esquematizado**. 1. ed. São Paulo: Método, 2011.

REQUIÃO, Rubens. **Curso de direito comercial**. 30. ed. São Paulo: Saraiva, 2010. V.1.

SCHUMPETER, A. J. **Teoria do desenvolvimento econômico**. São Paulo: Nova Cultural, 1985.

—. **Capitalismo, socialismo e democracia**. Rio de Janeiro: Zahar, 1984.

—. **A instabilidade do capitalismo**. In: CARNEIRO, R. (Org.). Os clássicos da economia. São Paulo: Ática, 1997. p. 68-96.

SINGER, Paul. **Desenvolvimento capitalista e desenvolvimento solidário**. Estudos Avançados, [S.L.], v. 18, n. 51, p. 7-22, ago. 2004. FapUNIFESP (SciELO). <http://dx.doi.org/10.1590/s0103-40142004000200001>.

WALRAS, L. **Compêndio dos Elementos de Economia Política Pura**. São Paulo: Abril Cultural, 1983.

VANIN, Carlos Eduardo. **Propriedade Intelectual: conceito, evolução histórica e normativa, e sua importância**. Jusbrasil, [S.l.], 2017. Disponível: <https://www.jusbrasil.com.br/artigos/propriedade-intelectual-conceito-evolucao-historica-e-normativa-e-sua-importancia/407435408>.

VIOTTI, E. B. **Brasil: de política de C&T para política de inovação? Evolução e desafios das políticas brasileiras de ciência, tecnologia e inovação**. In: Avaliação de políticas de ciência, tecnologia e inovação: Diálogo entre experiências internacionais e brasileiras (Seminário Internacional), Brasília: CGEE, p. 137-173, 2008.

CONTACT INFO NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Juliano Costa	Brazil	Inova - Unicamp	julianoc@unicamp.br
Leticia Pavanatte	Brazil	Inova – Unicamp	lepagasp@unicamp.br

r



XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: A Triple Helix Approach to assist University in facing the social challenge of inclusion in the workplace

TYPE C: practical case

TRACK: 4. Better Tomorrow: Engagement for Social and Environmental Impact

PURPOSE: The paper presents a practical case and discuss and experience analysis of an institutional inclusion policy in a private-community university in South of Brazil. This policy promotes that neuroatypical students receive a quality education to enter the job market, with a view to their effective integration into social and collective life, through the articulation to be carried out by the Triple Helix collaborations.

DESIGN/METHODOLOGY/APPROACH: Case report about the institutional policy for the inclusion of students with special educational needs in a private-community university in South of Brazil. The three-fold of Triple Helix collaborations will be addressed to promote a set of interactions between community engagement, work-integrated learning and work readiness into the curricula.

FINDINGS OR EXPECTED OUTCOMES: Within the University, the aim is to achieve SDG 4, relating to the promotion of quality education, with its ten targets involving everything from early childhood education to higher education. The SDG is designed to ensure inclusive, equitable and quality education, as well as ensuring that all people have the opportunity for lifelong learning, and has an equitable nature, to make opportunities more equal and achieve the ideal of developing a more diverse working environment. Thus, the 2030 Agenda recommends that governments contribute to the transition between school and work, as well as adapting their curricula to propose an education that develops basic skills so that, before developing technical skills, the individual is able to identify and value their own skills within their profession and social practices. As outcomes, the paper intends to show the how the practical case of



an institutional inclusion policy can contribute to prepare neurodivergent individuals for the job market. Thus, the University, through its institutional inclusion policy, promotes that neuroatypical students receive a quality education in order to enter the job market, with a view to their effective integration into social and collective life, through the articulation to be carried out by Triple Helix of university-industry-government.

ORIGINALITY/VALUE:

The value is based on the idea of reducing historical inequalities, through the construction of social development, which includes the diversity in the work environment to contribute to reducing the social challenge of building a fairer society and supportive, also taking into account the idea of the S aspect of ESG (Environmental, Social and Governance). The letter S, is how the company respects its partners: customers, collaborators, and employees and themes that are involved in this agenda are inclusion and diversity; human rights; labor policies and relations; community relations and workforce training.

PRACTICAL/SOCIAL IMPLICATIONS:

Preparing neurodivergent individuals for the job market is a comprehensive process that must include specific work on technical, vocational and socialization skills, aiming not only to increase employability, but also to promote the autonomy of these professionals in their search for positions. The search for an inclusive, adapted, and egalitarian working environment is supported by the National Policy for the Integration of People with Disabilities, which states that they have the right to a job of their own choosing and acceptance, on an equal footing with other people. The social function of the company is set out in article 170 of the Brazilian Federal Constitution of 1988, which states that the economic order must be based on valuing work and free enterprise, harmonizing social ends with the other interests of the community, with a view to observing basic principles such as free competition, creating and fully seeking jobs, contributing to economic development, reducing regional and social inequalities, among many others. Besides the legislation that impose on companies the need for and importance of adaptations in the work environment for the inclusion of neurodivergent people, there are a lot of benefits for the business. It is



necessary to start from the premise that humans should be treated as humans and no longer mere resources, raising issues related to work-life balance, multigenerational workforce, mental health, diversity and inclusion and value chain. People will once again be the “main asset of a company”, no longer being able to be treated, in a utilitarian way, just as “resources” whose value depends on the function they perform and the time allocated to it, under penalty of weakening the relationships between employers and employees. It can be said that the focus of companies must now be based on an economic mechanism concerned with solving important human problems, with guaranteeing human rights, fundamental for a dignified existence.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The preparation of neurodivergent individuals for the job market is a comprehensive process that must present specific work on technical, vocational and socialization skills, aiming not only to increase employability, but also to promote the autonomy of these professionals in their search for positions in the workplace, where diversity needs to be present. In this way, the university also fulfills its role as an entrepreneurial university, and the Triple Helix Model works in a connected way to face the social challenge of inclusion and diversity. About limitations, we can say that the path is long, and it is necessary to be sensitive to understanding the differences, promoting a humanistic approach, aiming at the construction of knowledge and the social insertion of all.

KEYWORDS (3-5): Inclusion; education; workplace; diversity.

REFERENCES

Brasil. [Constituição (1988)]. **Constituição da República Federativa do Brasil de 1988**. Brasília, DF: Presidência da República, 1988.

Etzkowitz, Henry. **Hélice Tríplice: universidade-indústria-governo: inovação em ação**. Porto Alegre: EDIPCRS, 2009.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Hasche, Nina; Höglund, Linda & Linton, Gabriel. Quadruple helix as a network of relationships: creating value within a Swedish regional innovation system, **Journal of Small Business & entrepreneurship**, 32:6, 523-544, 2020.

Morawska-Jancelewicz, J. The Role of Universities in Social Innovation Within Quadruple/Quintuple Helix Model: Practical Implications from Polish Experience. **J Knowl Econ** 13, 2230–227, 2022.

Yao, W., Li, H. & Weng, M. The Role the University Could Play in an Inclusive Regional Innovation System. **Triple Helix** 5, 12, 2018.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Raquel von Hohendorff	Brasil	Unisinos	vetraq@gmail.com rhohendorff@unisinos.br
Gisele Spricigo	Brasil	Unisinos	giseles@unisinos.br
Silvio Bitencourt da Silva	Brasil	Unisinos	sibitencourt@unisinos.br

05

Triple Helix Model in Practice around the world



XXII Triple Helix Conference – 2024

TITLE: University Policies & Innovation: A Cluster Analysis

TYPE a. original research

TRACK: 5. Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE: Numerous universities are actively promoting technology transfer and intellectual property registration (Rothaermel et al., 2007; Siegel & Wright, 2015), in addition to fostering collaborative projects with businesses and governmental entities. Promoting regional and national economic and social development through innovation has been discussed as one of the missions of higher education institutions (Sánchez-Barrioluengo & Benneworth, 2019; Perkmann, 2013). Analyzing the strategies employed by research universities in engaging with the innovation process and understanding the integration of innovation within the missions of universities is a globally recognized and evolving area of study (Nugent, 2023). This study aims to conduct an analysis of this subject based on a comprehensive survey conducted in all federal universities across Brazil. Data were collected and analyzed to diagnose the extent and manner of involvement federal universities in innovation activities.

DESIGN/METHODOLOGY/APPROACH: Striving to incorporate constituent variables associated with actions and regulations centered on university innovation, we conducted an extensive multiple correspondence analysis to elucidate overarching patterns in constitution and performance. Twelve variables were selected from each university, leveraging complete datasets to discern clusters of analogous profiles within the university cohort. The methodology employed entailed the integration of Multiple Correspondence Analysis (MCA) with Hierarchical Clustering on Principal Components (HCPC) (Di Franco, 2016). The considered variables were: Number of years since the university's foundation; Number of distinct faculty members in Postgraduate Programs; Existence of actions, activities, or programs for active and systematic exploration of problems and opportunities in companies, the public sector, or society, with the aim of establishing partnerships; Implementation of the capture of demands and problems from external agents and forwarding to potential project coordinators on websites; Technology Transfer Rate per Overall IP; Average processing time for project approval, from the researcher/teacher's formal request to their department or academic unit to which they are immediately affiliated, making it eligible for execution; Duration of internal regulations, in addition to the Innovation Policy, on intellectual property management; Duration of internal regulations, in addition to the Innovation Policy, on technology transfer; Existence of actions, initiatives, or strategies, goals, or indicators in the Institutional Development Plan (PDI) focused on intellectual property production; Existence of actions, initiatives, or strategies, goals, or indicators in the PDI focused on technology transfer; Scholarly Output - Collaboration with companies; and Total IP at the national level. The data were analyzed using the open-source software R.

FINDINGS OR EXPECTED OUTCOMES: As a result, the most pertinent variables for the categorization of universities into clusters were: faculty in postgraduate programs, Scholarly Output, Internal Regulation in the Institutional Development Plan (PDI) for Intellectual Property, and Internal Regulation in the PDI for Technology Transfer. Observing the three clusters, it becomes apparent that the longevity and tradition of universities matter, but do not necessarily determine high levels of Scholarly Outputs.

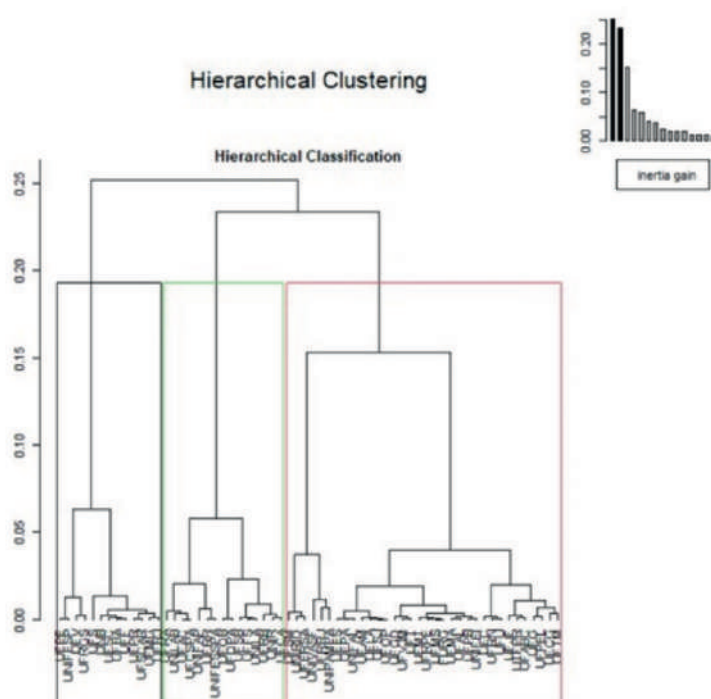


Figure 1: Hierarchical Clustering of Universities after Multiple Correspondence Analysis.

ORIGINALITY/VALUE: The present study provides two original contributions to the subject. The first is its breadth and coverage, involving, for the first time, data from all federal public universities in Brazil. The second is the combination of data analyses used in this study, which involves the association of Multiple Correspondence Analysis (MCA) with Hierarchical Clustering on Principal Components (HCPC).

PRACTICAL/SOCIAL IMPLICATIONS: The findings of this study contribute to diagnosing the extent and manner of involvement of federal universities in innovation activities and Technology Transfer (Padilla Bejarano et al., 2023). The universities with the highest publication rates, reflecting significant Scholarly Output in scientific terms, also stand out in technological terms when considering the outputs of formalized innovation, documents, and plans within the universities. This relationship is more pronounced

in newer universities and correlates with patent and technology transfer outputs. It is noteworthy that older universities may achieve commendable results even without formalized documents and internal plans, as they already have a practice of transforming their outcomes into patents and technology transfers. As emphasized by Peer & Penke (2016), universities will not stimulate development and innovation on their own but depend on the absorptive capacity and cooperation of other stakeholders and actors. Therefore, network structures and cooperation are crucial for the co-production of knowledge among universities, businesses, public authorities, and civil society.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The starting point is to identify indicators of excellence that better represent their missions under their particular realities. Longitudinal studies are also strongly recommended for a more detailed analysis.

KEYWORDS (3-5): Multiple correspondence analysis; Innovation, Technology Transfer; Universities.

REFERENCES

- Di Franco, G. (2016). Multiple correspondence analysis: one only or several techniques?. *Quality & Quantity*, 50(3), 1299-1315. <https://doi.org/10.1007/s11135-015-0206-0>
- Padilla Bejarano, J. B., Zartha Sossa, J. W., Ocampo-López, C., & Ramírez-Carmona, M. (2023). University Technology Transfer from a Knowledge-Flow Approach - Systematic Literature Review. *Sustainability*, 15(8), 6550. <https://doi.org/10.3390/su15086550>
- Rothaermel, F. T., Agung, S. D., & Jiang, L. (2007). University entrepreneurship: a taxonomy of the literature. *Industrial and corporate change*, 16(4), 691-791. <https://doi.org/10.1093/icc/dtm023>
- Siegel, D. S., & Wright, M. (2015). Academic entrepreneurship: time for a rethink?. *British journal of management*, 26(4), 582-595. <https://doi.org/10.1111/1467-8551.12116>
- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'este, P., ... & Sobrero, M. (2013). Academic engagement and commercialisation: A review of the literature on university–industry relations. *Research policy*, 42(2), 423-442. <https://doi.org/10.1016/j.respol.2012.09.007>
- Sánchez-Barrioluengo, M., & Benneworth, P. (2019). Is the entrepreneurial university also regionally engaged? Analysing the influence of university's structural configuration on third mission performance. *Technological forecasting and social change*, 141, 206-218. <https://doi.org/10.1016/j.techfore.2018.10.017>
- Nugent, A., & Chan, H. F. (2023). Outsourcing university research commercialization to a sophisticated technology transfer office: Evidence from Australian universities. *Technovation*, 125, 102762.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

<https://doi.org/10.1016/j.technovation.2023.102762>

Peer, V., & Penker, M. (2016). Higher education institutions and regional development: A meta-analysis. *International Regional Science Review*, 39(2), 228-253. <https://doi.org/10.1177/0160017614531145>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Luciane Graziele Pereira Ferrero	Brazil	Unicamp	lucianegraziele@gmail.com
Marcos Candido de Paula Rezende	Brazil	CGU	marcos.rezende@cgu.gov.br
Sérgio Luiz Monteiro Salles Filho	Brazil	Unicamp	sallesfi@unicamp.br



XXII Triple Helix Conference – 2024

TITLE: THE PERFORMANCE OF THE PUBLIC SECTOR IN THE INNOVATION ECOSYSTEM OF THE MUNICIPALITY OF CRICIÚMA, SANTA CATARINA.

TYPE: Practical case / experience analysis.

TRACK: Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real- World Impact

PURPOSE: The present study aims to investigate the role of the public sector in promoting innovation in the municipality of Criciúma, SC, considering the interaction of the triple helix in the municipality and the provisions of Law 7375/2018, which establishes guidelines for the development of policies and actions aimed at promoting innovation.

DESIGN/METHODOLOGY/APPROACH: To make this scientific study viable, the methodology was strategically defined, being a qualitative and descriptive research using a case study and technical application of interviews. However, to make it possible to carry out the interview stage, a script was prepared based on the theoretical current pertinent to the approach, in a way that allowed the data collection process to be solid, while consequently ensuring the crucial aspects of the phenomenon under analysis. This theoretical approach permeated not only the formulation of the questions, but also guided the definition of the analysis categories, resulting in a methodological structure that favors the integrity and depth of the data obtained through the interviews.

FINDINGS OR EXPECTED OUTCOMES: The study analyzes the participation of the public sector in the innovation ecosystem of Criciúma, SC, exploring the interviewees' perception of support for innovation in the region. The interviews reveal different points of view: while some highlight positive city hall initiatives, such as tax incentives and programs to promote startups, others point out challenges, such as bureaucracy and the lack of publicity for events. The interaction between government, companies and universities is essential to drive innovation and sustainable development. Collaboration between these actors

can overcome obstacles and seize opportunities to promote economic and social growth in the region. Furthermore, the integration of innovative practices from startups can inspire the modernization of traditional companies, enriching the local innovation ecosystem.

ORIGINALITY/VALUE: This study presents a meticulous and comprehensive approach to the composition of the public sector in Criciúma, SC, innovation ecosystem, revealing diverse perceptions from interviewees and in-depth analyzes of the challenges and opportunities faced. The importance of collaboration between government, companies, and educational institutions to promote innovation and boost sustainable development in the region is highlighted.

PRACTICAL/SOCIAL IMPLICATIONS (ABSTRACT):

According to Etzkowitz and Leydesdorff (1997), the triple helix of innovation portrays a fruitful model of dynamic interaction between government, companies and universities as essential drivers of the innovative process in a knowledge-based economy. Since then, several scientific authorities have contributed to the understanding and development of this approach, enriching it with new perspectives and applications. In this direction, the triple helix requires dynamic and continuous involvement between actors, where knowledge can play the central role of stimulating reflections around the expertise of each helix, while facilitating the consensus necessary to drive innovation. In this context, researchers highlight that when scientists use knowledge with the aim of solving society's problems and generating income, science itself transcends its purely cultural role, becoming an integral part of the productive force in the innovation ecosystem (Etzkowitz and Zhou; 2017).

The present study therefore investigates the role of the public sector in promoting innovation in the municipality of Criciúma, SC, considering the provisions of Law 7375/2018, which establishes guidelines for the development of policies and actions aimed at promoting innovation. Through interviews with representatives from the public, private and academic sectors, perceptions and experiences related to the promotion of innovation and its impacts on local development were analyzed.

To make this scientific investigation viable, we strategically opted for a qualitative and descriptive methodological approach, employing case studies and technical interviews. However, to guarantee the

solidity of the data collection process, a script based on the theoretical current was prepared as a proposal for guidance for the analysis questions, as well as the categories.

In this sense, the analysis is divided into two main categories, allowing us to understand, firstly, the role of the local government in the innovation ecosystem through the positioning of the economic development and innovation directorate of the municipality of Criciúma and, subsequently, the second category of The analysis aims to investigate the perspective of the company and university helices on the performance of the regional government, which in line with the public authorities make up the triple helix model of innovation suggested by Etzkowitz and Leydesdorff (1997).

Public sector involvement in the innovation ecosystem plays a vital role in driving economic and social progress. The municipality of Criciúma stands out for its diversified economy, particularly in the mining, ceramics and information technology sectors. In this context, cooperation and integration between the public sector, companies, universities and other local actors are fundamental to promoting innovation, strengthening competitiveness and promoting lasting and sustainable growth (FIESC, 2024).

However, it is noteworthy that the present study marks the beginning of an in-depth analysis, anticipating future investigations that will explore different perspectives. The next stages of scientific production will include rotational analysis, therefore investigating how the other helices perceive the role of companies in promoting innovation, while the third study will focus on the vision of universities. This approach seeks to achieve meticulous data collection, providing a holistic understanding of the region based on the samples examined.

Among the companies interviewed, a contrast between tradition and innovation stands out in this study: a company with a traditional model, with a conventional approach and limited involvement with innovation, and a startup, representing the technological vanguard. These different views offer a comprehensive view of the dynamics present in the context studied, as well as an understanding of the influence of the public sector on the harmony of the triple helix of innovation.

The results indicate that the city of Criciúma has adopted concrete initiatives to foster innovation, including the creation of the Municipal Innovation Council and the implementation of the Inova Criciúma program. This program, highlighted by interviewees from different sectors, has contributed to the emergence



and growth of startups in the region, in addition to promoting partnerships between government, companies and universities.

Despite advances, some challenges persist, such as bureaucracy and the lack of preparation of public servants to deal with innovative processes. Furthermore, there is a need for greater integration between large companies and startups, as well as a more effective communication strategy.

In this context, collaboration between the various actors in the innovation ecosystem is essential to overcome obstacles and take advantage of opportunities for economic and social development. The implementation of Law 7375/2018 and other government policies have been important catalysts for this process, but it is essential that the government continues to invest in policies and programs that stimulate innovation and meet the demands of the local community.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: After the strategic definition of the research stages and the search string to monitor published works, five interviews were carried out, covering in addition to the public sector, the sectors: private (company) and university, thus comprising the three helices of innovation to, at this moment, understand the role of the public sector in the innovation ecosystem, but also with the perception of the other two actors that make up the triple helix of innovation, identified as:

a) E1 – Government; b) E2 – Company e; c) E3 – Company; d) E4 – University e; e) E5 - University.

KEYWORDS (3-5) Triple Helix of Innovation; Public Policy; Government; Regional Development.

REFERENCES

- Chesbrough, H. (2003). Open Innovation: The New Imperative for Creating and Profiting from Technology. Harvard Business Press.
- Edmondson, A.C. (2020). A Organização Sem Medo: Criando segurança psicológica no local de trabalho para aprendizado, inovação e crescimento. Rio de Janeiro: Alta Books, 256p.
- Edquist, C. (2005). Systems of innovation: Perspectives and challenges. In Systems of innovation (pp. 181- 197). Edward Elgar Publishing.
- Etzkowitz, H., & Leydesdorff, L. (1997). Universities and the Global Knowledge Economy: A Triple Helix of University-Industry-Government Relations. Cassell Academic.
- Etzkowitz, H; Zhou, C. Hélice Tríplice: Inovação e empreendedorismo universidade-indústria-governo. Inovação • Estud. av. 31 (90) • May-Aug 2017 <https://doi.org/10.1590/s0103-40142017.3190003>

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Federação das Indústrias de Santa Catarina (2024). Observatório. Disponível em: <https://observatorio.fiesc.com.br/indicadores>

Florida, R. (2002). The rise of the creative class: And how it's transforming work, leisure, community and everyday life. Basic books.

Global Innovation Index (2023). Disponível em: <https://www.wipo.int/edocs/pubdocs/en/wipo-pub-2000-2023-en-main-report-global-innovation-index-2023-16th-edition.pdf>

Índice de Cidades Empreendedoras (2023). Disponível em: [disponível em: https://ice.enap.gov.br/ranking](https://ice.enap.gov.br/ranking)

Política de Inovação, Lei 7375. Disponível em: <https://www.camaracriciuma.sc.gov.br/lei-municipal/lei-ordinaria-28/lei-no-7375-de-13-de-dezembro-de-2018-7375>

Porter, M. E. (1998). Clusters and the new economics of competition. Harvard business review, 76(6), 77-90.

Schumpeter, J. A. (1942). Capitalism, Socialism and Democracy. Harper & Brothers.

Tidd, J., & Bessant, J. (2009). Managing Innovation: Integrating Technological, Market and Organizational Change. John Wiley & Sons.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Jaqueline Bitencourt Lopes	Brazil	UFSC	jaqueline@firmament.com.br
Clarissa Stefani Teixeira	Brazil	UFSC	clarissa.stefani@ufsc.br
Gertrudes Aparecida Dandolini	Brazil	UFSC	gertrudes.dandolini@ufsc.br
João Artur De Souza	Brazil	UFSC	jartur@gmail.com



XXII Triple Helix Conference – 2024

TITLE: Evolution of the Triple Helix as an academic movement – Bibliometric analysis of communications at conferences

TYPE: original research

TRACK: 5.2 Challenges and solutions in Triple Helix implementation

PURPOSE: The Triple Helix approach is a commonly used metaphor to understand and analyze the relationships among the actors that make up innovation ecosystems. It was created in 1995 to interpret the interaction among actors generating technical-scientific knowledge (academia), those using such knowledge (the goods and services producing sector), and the sector regulating and fostering economic activity (government). The main aim of this approach was to promote innovation and economic and social development at the local and national levels (ETZKOWITZ, 2008).

In 2009, a database of scientific communications related to Triple Helix (TH) was created to help the organizing team of the 2010 conference. The team needed to be familiar with the academic production of previous events to define relevant topics to be included in the call for papers, identify authors and institutions involved with the theme, and engage inactive institutions. Since then, new database versions have been made available to the Triple Helix Association, conference organizers, and scholars of the subject. The database has been analyzed in several publications, including those by AMARAL and FERREIRA (2013), ROSA, MESSIAS, and AMARAL (2018), AMARAL and MESSIAS (2020), and SILVA and AMARAL (2022).

This article aims to present the 2024 version of the database, analyzing the recent trajectory of the TH movement.

DESIGN/METHODOLOGY/APPROACH: To handle the different types of material, a term called "scientific communication" was used as the primary input element for the communications database. This term distinguishes scientific articles from non-scientific articles (such as journalistic or opinion pieces). The database was organized in MS Excel using twelve metadata criteria. It allows bibliometric techniques to be used to analyze scientific production on TH, including active and prolific authors, institutions, and countries. The advantage of this database over other databases like *Scopus* or *Web of Science* is that it involves more thorough registration work, especially concerning publications at conferences, seminars, and events.

FINDINGS OR EXPECTED OUTCOMES: According to previous analyses, proponents of the Triple Helix (TH) approach, Henry Etzkowitz and Loet Leydesdorff, have played the most active role in disseminating the approach worldwide, engaging researchers and academic institutions from different countries. The volume of scientific communications on TH confirms its relevance. In analyzing the

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

significant themes of the approach, actors and institutions from Brazil, the United Kingdom, the United States, Russia, and Italy played a significant role, while the involvement of companies and governments was lacking, making the movement essentially academic despite its central argument being the relationship between actors in the triad of propellers and actors. The analysis also identified a recent trend towards new approaches like the *Quadruple Helix*. Additionally, a secondary discussion on the impact of hosting a conference was held, which showed that most organizers and countries involved in holding a conference remained connected to the movement.

ORIGINALITY/VALUE: Databases and bibliometric techniques are frequently used to conduct systematic literature reviews. However, in this particular case, they are being utilized as a management tool for organizing conferences and have been recognized by the Triple Helix Association as an instrument for comprehending the academic movement's evolution.

PRACTICAL/SOCIAL IMPLICATIONS: This work is a valuable contribution to the Triple Helix Association, which represents researchers working on the topic and future conference managers. It is also useful for researchers seeking references to identify literature for a bibliographic review and to identify gaps and issues for further research and discussion.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The database has a limitation in that it cannot analyze co-authorship networks, which requires a more robust database management tool. However, this limitation only applies to journal articles. Regarding future research, new metrics can be introduced while keeping the database content updated. For instance, setting up a co-citation network for articles indexed in databases such as *Web of Science* would allow us to analyze what is indexed and not separately. Social network analysis tools can also be used, along with indicators such as Altmetrics for articles or *Google Scholar's* H Index, which can provide additional data on leading and emerging themes and authors. It is also possible to conduct analyses by institution over time and, based on this data, carry out studies through interviews and surveys with entities. This would help better understand their involvement with the theme and the movement.

KEYWORDS (3-5): Triple Helix, academic movement, bibliometric analysis

REFERENCES

- AMARAL, M. G.; FERREIRA, A. Triple Helix Movement Evolution: a Database from Academic Communications. *Triple Helix International Conference 2013 - Book of Abstracts*. London, 2013
- AMARAL, M. G.; MESSIAS, N. R. A evolução do movimento da triple helix: uma análise das comunicações científicas por meio de técnica bibliométrica. *International Journal of Innovation*, vol. 8, n. 2, 250-275, 2020. <https://doi.org/10.5585/iji.v8i2.17396>.
- AMARAL, M.; FARIA, A.; SCHOCAIR, M. Assessing the Innovation Environment of the Research Triangle Region. *Revista de Administração, Sociedade e Inovação*, v. 5, n. 2, p. 90-111, 2020. <https://doi.org/10.20401/rasi.6.2.386>
- ETZKOWITZ, H. The Triple Helix: Industry, University, and Government in Innovation. *Social Science Information*, v. 42, n. 3, p. 293-337, 2008.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

ROSA, J. A. A.; MESSIAS, N. R.; AMARAL, M. G. (2018). The Triple Helix Movement: An Analysis of Academic Communications. *Proceedings of XVI Triple Helix Conference*, Manchester, 2018.

SILVA, C. A. F. F.; AMARAL, M. G. Estudo Bibliométrico da Abordagem da Triple Helix A Partir de um Banco de Comunicações Científicas. *Semead – Seminários de Administração*, 2022.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Marcelo Amaral	Brazil	Fluminense Federal University	marceloamaral@id.uff.br
Edilane dos Reis Carraro	Brazil	Fluminense Federal University	edilane carraro4@gmail.com
Iasmim Ribeiro de Abreu e Costa	Brazil	Fluminense Federal University	iasmimabreu@id.uff.br



XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Democratizing Innovation: The 10:10:10:10 Vision of Triple Helix Nigeria

TYPE (a. original research, b. research Design or c. practical case/experience analysis)

TRACK: 5: Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE: This paper aims to present the innovative vision of Triple Helix Nigeria, known as the 10:10:10:10 Vision, which seeks to democratize innovation and foster commercialization in Nigerian universities.

DESIGN/METHODOLOGY/APPROACH: The approach involves outlining the strategic framework of the 10:10:10:10 Vision, which includes four pillars: entrepreneurial orientation, research and development collaboration, innovation infrastructure development, and innovation financing. Each pillar is supported by a well-crafted policy document and strategic initiatives.

FINDINGS OR EXPECTED OUTCOMES: The expected outcomes of the 10:10:10:10 Vision include increased entrepreneurial activity within Nigerian universities, enhanced collaboration between academia, industry, and government, improved innovation infrastructure, and access to sustainable financing mechanisms for research and development activities.

ORIGINALITY/VALUE: The originality of the 10:10:10:10 Vision lies in its comprehensive approach to democratizing innovation in Nigerian universities and its strategic focus on fostering collaboration, infrastructure development, and financing mechanisms to support research and innovation activities. The value of this vision lies in its potential to drive economic growth, job creation, and societal development in Nigeria.

PRACTICAL/SOCIAL IMPLICATIONS: The implementation of the 10:10:10:10 Vision is expected to have practical implications, including the creation of a vibrant innovation ecosystem, the commercialization of research findings, and the generation of intellectual property. Social implications include increased access to education, job opportunities, and improved standards of living.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Further research is needed in the future to assess the effectiveness and sustainability of the 10:10:10:10 Vision in achieving its



objectives. Limitations may include challenges related to policy implementation, resource constraints, and stakeholder engagement.

KEYWORDS (3-5): Innovation, Democratization and societal development, Triple Helix Nigeria, Commercialization, Triple Helix model.

REFERENCES

Triple Helix Nigeria (2024). Blueprint Framework. In print.

Xue, L., & Gao, Y. (2022). From modeling the interactions among institutions to modeling the evolution of an ecosystem: A reflection on the Triple Helix model and beyond. Triple Helix.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Eucharia Oluchi Nwaichi	Nigeria	University of Port Harcourt, Choba, Nigeria.	eucharia.nwaichi@uniport.edu.ng
ThankGod Itua Egbe	Nigeria	CypherCrescent Ltd, Port Harcourt Rivers State, Nigeria	thankgod.egbe@cyphercrescent.com
AbdulMalik Halilu	Nigeria	Nigerian Content Development and Monitoring Board (NCDMB), Yenagoa, Nigeria.	abdulmalik.halilu@ncdmb.gov.ng

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE:

Transforming Public Health Through Triple Helix Collaboration: insights from the IdeiaGov Program

TYPE:

Practical case/experience analysis

TRACK:

5 - Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE:

The purpose of this paper is to analyze the experience of IdeiaGov, an open innovation program implemented by the Economic Development Secretariat, the Government Secretaria, and the State Attorney General of the state of São Paulo from 2020 to 2023. The program was a relevant triple helix case, connecting government agencies, academia, and companies to solve complex challenges, mainly public health challenges during the COVID-19 pandemic. The paper will focus on the open innovation challenges implemented between the São Paulo state government, academia (the General Hospital of the Medical School of the University of São Paulo – HCFMUSP), and startups with innovative solutions to tackle complex challenges related to COVID-19 and public health services.

Analyzing this real-world experience will:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

- **Provide valuable lessons and insights:** Helping identify key factors that contributed to the success or failure of the program, as well as examining the situation from multiple perspectives.
- **Bridge the gap between theory and practice:** Case studies often involve applying triple helix model concepts to real-world scenarios.
- **Inform future actions or recommendations:** By identifying strengths and weaknesses in this particular case, the paper will offer insights for improvement or suggest alternative strategies.

METHODOLOGY:

This case study uses data triangulation techniques to explore the implementation of IdeaGov. Case study is a methodology used in applied social sciences to study various phenomena, as its objective is to identify similar and different aspects related to the research object (Yin, 2010). According to Schramm (1971), the essence of a case study is that it seeks to illuminate a decision or a set of decisions: why they are made, how they are implemented, and with what outcome. In this sense, the present research aims to identify the main peculiarities of the implementation of the IdeaGov program, study the political phenomenon of partnership between public, private, third-sector organizations and academia and how it occurred.

EXPECTED OUTCOMES:

- The triple helix model can be a relevant structure for open innovation programs addressing complex challenges. For example, one of IdeaGov challenges (“Connected ICUs”), enabled the introduction of 84 smart beds at HCFMUSP, modernizing hospital facilities and ensuring more efficient and personalized care for patients.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

- Institutional capacity from the three actors (government, academia and industry) is a determinant of the success of a project.
- Individual capabilities may play a relevant role in the impact of the project. Having engaged, well-informed and goal-oriented individuals working on the triple helix program is an important factor.
- Path dependency and political support are crucial for the continuity of initiatives. IdeiaGov Program was discontinued after the change of government in 2023. Even before the change in government, the program lost its priority as a policy inside the Economic Development Secretariat.

ORIGINALITY:

This case demonstrates a significant triple helix collaboration involving the São Paulo State Government, with IdeiaGov, HCFMUSP and several startups. The project aimed at implementing innovative solutions in the public sector. The institutional arrangement implemented enabled the Technological Innovation Center of HCFMUSP – InovaHC to gain maturity. This model of institutional collaboration demonstrates how significant triple helix programs can be, where the public administration, academia, and the private sector can drive open innovation and generate socioeconomic and institutional development. The initiative has not only responded to the challenges of the COVID-19 pandemic but has also set a precedent for frameworks of institutional arrangements for innovation, demonstrating the power of collaboration between different sectors.

PRACTICAL/SOCIAL IMPLICATIONS:

The partnership between IdeiaGov and InovaHC has influenced the innovation ecosystem and promoted tangible improvements in São Paulo public health service. Raising awareness and encouraging change, combined with governance and the use of technology, have been key to identifying opportunities

and managing projects effectively.

The public calls were launched with open challenges culminating in six contracted solutions, generating efficiency gains in health services. From the first edition of the program, an investment of R\$ 1.7 million was used to coordinate over 230 public services, which underwent training to develop innovative capabilities. Following the completion of tests, more than 30.000 users were impacted during the pandemic, resulting in over R\$7 million in signed contracts.

IdeiaGov's relative success as a national reference for open innovation programs led to a spillover effect, influencing other initiatives, like In.pulse Long Covid and other programs nationwide.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Among the limitations of the research, it is noted the possibility that some documents may not be captured by the methodology. Considering that these data are important for building an understanding of the program, enhancing data collection techniques, including considering automated resources, and conducting more interviews can provide greater accuracy. As directions for further research, there is an opportunity to observe the significant impacts in the medium and long term of the participating entities and if the open innovation practices were adopted by public servants.

KEYWORDS:

Open Innovation; Triple Helix; Public Health.

REFERENCES

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

YIN, Robert K. *Case Study Research: Design and Methods*. 4ª edição. Sage Publications of London, Thousand Oaks and New Delhi and Singapore.

SCHRAMM, W. 1971. *Notes on case studies of instructional media projects*. Working paper for the Academy for Educational Development, Washington, DC.

SÃO PAULO. Governo do Estado de São Paulo. *Decreto n.º 64.974/2020*. Available at: <https://www.al.sp.gov.br/repositorio/legislacao/decreto/2020/decreto-64974-12.05.2020.html>.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Julia Ribeiro de Almeida Veneziani	Brazil	InovaHC	julia.veneziani@hc.fm.usp.br
Evandro Matheus dos Santos Silva	Brazil	InovaHC	evandro.matheus@hc.fm.usp.br
Gabriel Romitelli	Brazil	InovaHC	gabriel.romitelli@hc.fm.usp.br
Luciana Lischewski Mattar	Brazil	InovaHC	luciana.mattar@hc.fm.usp.br
Natasha Zanaroli Scaldaferrì	Brazil	InovaHC	n.scaldaferrì@hc.fm.usp.br



TITLE: Intersections of academia, industry, and government that shape the future of innovation: Opportunities and challenges from the South African clothing industry

TYPE (original research)

TRACK: 5. Triple Helix Model in Practice around the world

PURPOSE: This paper endeavours to make a scholarly contribution to the development and improvement of competitive advantage in the South African clothing, textiles, leather and footwear (CTLF) industry. Through the Triple Helix model and to a lesser extent, the diamond model of competitive advantage, the paper explores opportunities and challenges arising from the intersections of academia, industry and government to positively impact the development and improvement of competitive advantage in the South African clothing industry. This paper underscores the role that these intersections can play in positively contributing to the Sustainable Development Goals (SDGs), African Union Agenda 2063 (AU Agenda 2063) in South Africa.

DESIGN/METHODOLOGY/APPROACH: This paper applied theoretical, philosophical, methodological and data triangulation to address the purpose of this study. Ethical approval (ethical approval no: FREC 2018/03/05) to engage in the study was sourced and provided by the host institution. Participants were sourced from all actors throughout the country to respond to a semi-structured interview schedule and questionnaires which were thematically (Braun and Clarke, 2006) and descriptively analysed to provide insights on opportunities and challenges from the intersections of academia, industry and government in the South African clothing industry arising. The employed reliability and validity measures as well as trustworthiness (Connelly, 2016: 435) to quality assure the qualitative and quantitative data analysis respectively. A Cronbach Alpha of 0.80 was achieved for the quantitative data which confirms that the data is reliable.

FINDINGS: The quantitative data analysis shows that the CLTF industry firms identified labour productivity, quick response, enhancing technology, and sourcing of raw materials are key opportunities for intersections of academia, industry, and government to shape future innovation. Qualitative data

analysis highlights that the development of a research and development intersections directorate, the development of an academic, textiles industry and government complete value chain, and conducting industry-relevant research are opportunities for intersections of academia, industry, and government to shape future innovation. Given this analysis from the triangulated analysis, the findings underscore the opportunity to deepen intersections of academia, industry, and government to shape future innovation. In this case, the paper also found challenges that may limit the intersections of academia, industry, and government in the CTLF industry of South Africa to shape future innovation.

The quantitative data analysis shows that the challenges of intersections of academia, industry, and government to shape future innovation include lack of funds for intersections, and no knowledge of the contact person in government and academia for intersections of academia, industry, and government. Qualitative data analysis underscores curriculum mismatch, gaps in the systems of innovations, lack of funding, and lack of advanced skills for intersections of academia, industry, and government thus negatively impacting future innovation in the CTLF industry of South Africa. Addressing these challenges may positively contribute to the achievement of opportunities for intersections of academia, industry, and government to shape future innovation.

ORIGINALITY/VALUE: Existing knowledge about intersections of academia, industry, and government in the CTLF industry of South Africa (Sihlobo and Mbatha, 2021; Mbatha and Mastamet-mason, 2023; Mbatha and Sihlobo, 2024) has not highlighted opportunities and challenges that have the potential to the development of competitive advantage, SDGs, AU Agenda 2063 of South Africa. Given its originality, this paper is important to the body of literature on the Triple Helix, South African CTLF firm executives, Multinational CTLF firm executives, academia in CTLF-related academic programmes, government relevant departments, CTLF industry unions, the CTLF associations as well as non-profit organisations operating in the CTLF industry of South Africa.

PRACTICAL/SOCIAL IMPLICATIONS: The CTLF industry is a priority sector for the South African government thus conducting research in this sector contributes to the socioeconomic development of South Africa. This paper has implications for academia, industry, government, policy, and socioeconomic

implications. For academia, this paper opens up opportunities to deepen intersections that will improve curriculum, increase access to research funding, and improve the relevancy of undertaken research. This paper promises insights for the CTLF industry into intersections of academia, industry, and government opportunities and challenges that may shape future innovation and competitive advantage. For government practitioners, this paper identifies opportunities as well as challenges that if pursued, may reduce the triple challenge of poverty, inequalities, and unemployment using the CTLF industry of South Africa.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The direction of further research should be guided by the intersections of academia, industry, and government to shape future innovation opportunities and challenges identified by this paper to improve future innovation in the CTLF industry of South Africa. Future research should focus on how to take advantage of the identified opportunities and minimise the identified challenges for intersections of academia, industry, and government to shape future innovation and achieve future innovation.

The limitation of this paper is the low response rate for the quantitative section of this study which is supplemented by the adequate qualitative section of this paper. This study was also limited to fashion design academic departments and not all CTLF-related academic departments. Despite these limitations, the contributions of the paper to the body of knowledge and practitioners in the CTLF industry of South Africa are worth publishing.

KEYWORDS: Clothing and textiles industry, Triple Helix, Diamond model, Innovation, UIG, and systems of innovation.

REFERENCES

- Braun, V & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77–101. doi:10.1191/1478088706qp063oa.
- Connelly, L. M. 2016. Trustworthiness in Qualitative Research. *Medsurg Nursing*, (25)6, 435 – 436.
- Sihlobo, S. & Mbatha, S. 2022: University-industry-government research and development collaborations in public higher education institutions in South Africa, *African Journal of Science, Technology*,

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Innovation and Development, DOI: 10.1080/20421338.2021.2016559.

Mbatha, S. & Mastamet-Mason, A. 2023. Examining the Effectiveness of the South African Apparel Industry's Systems of Innovation. *Academic Journal of Interdisciplinary Studies*. (12) 1. [//doi.org/10.36941/ajis-2023-0014](https://doi.org/10.36941/ajis-2023-0014).

Mbatha, S & Sihlobo, S. 2024. The Role of Uig Linkages in Improving Competitive Advantage: A Case of the Clothing, Textiles, Leather, and Footwear Industry of South Africa, *Academic Journal of Interdisciplinary Studies*, (13) 2. 270-283.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Dr Sipho Mbatha	South Africa	Tshwane University of Technology	mbathas@tut.ac.za / siphombatha247@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Challenges of Knowledge and Technology Appropriation in Rural Properties in an Emerging Innovation Ecosystem

TYPE: Original research.

TRACK: Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE: This study aims to delineate the knowledge acquisition processes within rural property enterprises for product and process innovation, scrutinizing their openness and external relational dynamics for the assimilation of external knowledge and innovations to achieve competitive advantage.

DESIGN/METHODOLOGY/APPROACH: The research was carried out by 69 online and in-person interviews in the year 2023. 60.9% of the respondents are characterized as rural enterprises, which formally employ workers during harvesting seasons and/or throughout the entire year. All the companies interviewed are situated within one of Brazil's leading business ecosystems (considering the definition proposed by Iansiti; Levien, 2004; Moore, 1993; Scaringella; Radziwon, 2018) for the horticulture and fruit sector. However, in terms of innovation, this ecosystem is regarded as an emerging innovation ecosystem. Appropriation of knowledge and Technology were verified based on the questionnaire proposed by Sprakel & Machado (2021). Predominantly qualitative data were transcribed and encoded into an electronic spreadsheet, enabling subsequent quantitative analyses, through descriptive statistical analyses.

FINDINGS: The research findings indicate that firms within the rural sector predominantly engage with their suppliers (average score of 4.20 on a scale where 5 represents the highest frequency) to access knowledge and technology. There exists a moderate level of interaction with public research entities such as Epagri and Embrapa (average score of 3.53) and with competitors (average score of 3.47). However, the data shows a notable paucity in the interaction between these rural enterprises and other key actors in the

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

regional Triple Helix model: public sector agencies (average score of 2.78), universities and colleges (which are prolific in the region and generate some sector-specific technologies, average score of 2.39), professional training and technical assistance centers such as SENAR/Sebrae (average score of 2.36), producer associations (average score of 2.15), and consulting firms (average score of 2.04).

ORIGINALITY/VALUE: There are, at least, five contributions: (1) Ecosystem-Specific Insights: The study provides granular insights into a specific regional ecosystem, focusing on the horticulture and fruit sector in Brazil. This specificity adds valuable knowledge to the understanding of innovation dynamics in a developing country context, which is often underrepresented in innovation literature; (2) Sectoral Innovation Patterns: by concentrating on rural properties, the research sheds light on innovation patterns in the agriculture sector, which has unique characteristics due to its close ties to natural resources, seasonality, and varying technological adoption rates; (3) Dependency Dynamics: The revelation that rural firms are heavily reliant on suppliers for innovation is a significant finding. It highlights a critical dependency that could influence strategic decision-making and policy development within the sector; (4) Interaction Frequency with Triple Helix Actors: The study measures the frequency of interactions with different Triple Helix actors, providing a clear, empirical foundation for assessing the strength and weaknesses of these relationships; and (5) Emergent Innovation Ecosystem Characterization: The characterization of the ecosystem as an "emerging innovation ecosystem" contributes to the typology of innovation systems, suggesting a phase of development that may require different strategies and policy interventions compared to mature ecosystems.

PRACTICAL/SOCIAL IMPLICATIONS: These results suggest that producers may be significantly reliant on their suppliers for knowledge and technology, potentially to the detriment of broader ecosystem engagement. Additionally, it is imperative to acknowledge the weak interaction among the regional Triple Helix constituents with the sector, evidenced by the infrequency with which these producers/entrepreneurs tap into ecosystem actors for knowledge and technology acquisition.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Future research could broaden the scope to include more varied actors within the ecosystem. It could assess the roles and influences of

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

non-traditional stakeholders, such as non-governmental organizations, community leaders, and international entities, in knowledge and technology transfer within the rural sector. Also, there is a need for longitudinal research to understand the evolution of relationships and knowledge flows over time. This would help in ascertaining whether the dependency on suppliers is a transient phase or a persistent trend. Finally, comparative studies between different regional ecosystems, or international comparisons, could provide insights into how contextual factors influence the interaction patterns observed.

KEYWORDS: Innovation. Innovation Ecosystem. Triplex Helix. Agribusiness.

REFERENCES

- Iansiti, M., & Levien, R. (2004). Strategy as Ecology. *Harvard Business Review*, 82(3).
- Moore, J. F. (1993). Predators and prey: a new ecology of competition. *Harvard Business Review*, 71(3), 75–86.
- Scaringella, L., & Radziwon, A. (2018). Innovation, entrepreneurial, knowledge, and business ecosystems: Old wine in new bottles? *Technological Forecasting and Social Change*, 136(December 2015), 59–87. <https://doi.org/10.1016/j.techfore.2017.09.023>
- Sprakel, E., & Machado, A. (2021). Open innovation strategies and appropriability in knowledge-intensive business services: Evidences and implications in the brazilian context. *Brazilian Business Review*, 18(1), 62–81. <https://doi.org/10.15728/BBR.2021.18.1.4>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Ivanete Schneider Hahn	Brazil	University of São Paulo (USP) and Uniarp	ivischneider@hotmail.com
Leandro Hahn	Brazil	Company of Agricultural Research and Rural Extension of Santa Catarina (Epagri)	leandrohahn@epagri.sc.gov.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Enhancing the Employability of Nigerian Engineering Graduates by Efficient University-Industry-Government Partnerships

TYPE (a. original research, b. research Design or c. practical case / experience analysis)

TRACK: 5. Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE: Employers typically assert that most Nigerian engineering graduates are unemployable. How can they be made employable? Recruitment exercises tend to place greater emphasis on “experienced” professionals and specialists, with little space for fresh graduates. This raises concerns about succession, mentorship and human capital development, especially considering the perpetual skills shortage in industry. This paper objectively assesses the manpower, training, basic education and human resource issues that are critical to the Nigerian industries and tertiary educational institutions. This is crucial and responsive to ongoing/proposed industrialisation efforts, capital flight occasioned by overdependence on imports and expatriates (even for routine jobs), gross underutilization of abundant and exceptional local human capacity, and the Federal Government’s local content drive.

DESIGN/METHODOLOGY/APPROACH: The research design constitutes a mixed method – qualitative and quantitative – to analyse secondary data extracted from relevant literature and databases to deliver the research objectives. It examines the concept of engineering employability from a global perspective, the status of engineering education in Nigeria, the general rating of Nigerian engineering graduates against employability skills, structure of various partnership models (university-industry, university-government, industry-government and university-industry-government) that exist in Nigeria as well as their successes and challenges. Barriers to effective partnerships and gaps in their functionalities

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

are benchmarked against the Triple Helix Model to critically evaluate areas for improvement, using some lived experiences of the author from two research-intensive universities in the United Kingdom and two top engineering-focused universities in Nigeria as case studies. The results are then drawn upon to design a roadmap for developing and sustaining a Triple Helix Model for engineering programs in Nigeria from undergraduate studies to professorship level, with continuous improvement functionality.

FINDINGS OR EXPECTED OUTCOMES: University-industry-government partnership models were generally identified to include contract research, collaborative research, sponsored research, graduate fellowships or studentships, internships, student projects and placements, honorary posts and secondments, university consultancy and spin off companies, job fairs, mobility programmes for studies and traineeships, etc. Some of these involve government inputs either as funding partner(s) or regulator, e.g., Erasmus+ Mobility Scheme of the European Commission, ongoing UK HyPER project on hydrogen production from renewable sources, a completed project phase on pseudo dry gas recovery involving four countries, the Industrial Training Fund of Nigeria, ongoing Nigerian Content Development and Monitoring Board (NCDMB) Petroleum Engineering Curriculum Enhancement Initiative, ongoing SPE/CypherCrescent Digital Capacity Development Initiative, and others to be elaborated in the manuscript. Barriers to effective triple helix partnerships in Nigeria were found to include reluctance of industry to invest in research and development, vested foreign interests in multinational companies, non-transparent recruitment/placement/award processes, lack of enabling policies, poor regulatory enforcement, corruption and lack of accountability, incessant industrial actions in public universities, poor work ethics, lack of motivation, administrative bottlenecks and conflicts of interests. Some of the recommended solutions are transparent and achievable learning/research outcomes with definable entries and exits, flexible learning, enhanced mobility across programmes and geographies, as well as continuous monitoring and evaluation by stakeholders.

ORIGINALITY/VALUE: This paper draws from and reflects upon learnings from both secondary sources and first-hand experiences in designing and implementing the triple helix model in both academia and industry across different countries in both Africa and Europe, inputting lessons from other third world

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

and developed nations. These are condensed into a novel roadmap for Nigerian engineering institutions taking into consideration the peculiarities of the national system, while ensuring constant review for benchmarking against global best practices. It also highlights the benefits to all the stakeholders from successful initiatives. The key takeaways will be helpful for other regions of the world upon adaptation to their individual circumstances, while setting the stage for the quadruple and quintuple models.

PRACTICAL/SOCIAL IMPLICATIONS: To define the quality of employable engineering graduates in Nigeria, key stakeholders in the triple helix (employers, universities and government) must synergise better. A similar move in the U.S. had been successful and can serve as a model. A set of competence-based professional standards – Engineering Criteria 2000 – had been developed and adopted by the Accreditation Board for Engineering and Technology (ABET) and can be replicated by their Nigerian counterpart. With diligent implementation of the recommendations, engineering education in Nigeria would be greatly improved in terms of graduate outcomes and research impacts with resultant effect of a more developed economy through commercialisation of home-grown technologies across different sectors.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The paucity of data on graduate outcomes, student experience, research impacts and technology incubation into practice need to be addressed through consistent efforts to document triple helix activities throughout their life cycle. These will help in evaluating the efficiency of ongoing and future initiatives against preset objectives and project deliverables. Achieving these requires all players in the triple helix taking responsibility and becoming accountable for all resources – men, materials, money and machines – invested in such ventures to ensure optimum utilisation and desired outcomes. Further research should explore workflows towards upgrading the triple helix into quadruple and quintuple models for Nigerian engineering schools.

KEYWORDS (3-5): Engineering graduates; employability metrics; Nigerian universities; partnership models; research and development

REFERENCES

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Anho, J. E. (2011) “An Evaluation of the Quality and Employability of Graduates of Nigeria Universities” *African Journal of Social Sciences* 1(1): 179-185.

Chiemeke, S. C. and Ukaoha, K. C. (2010) “Promoting Industry-University Partnerships in Information Technology in Nigeria”, *Proceedings of the Second Science with Africa Conference*, 165–169.

Dobryakova M. and Froumin, I. (2010) “Higher Engineering Education in Russia: Incentives for Real Change”, *International Journal of Engineering Education*, 26 (5), pp. 1032–1041.

Grandin, J.M. and Hedderich, N. (2009) “Intercultural Competence in Engineering: Global Competence for Engineers” in D. Deardorff (ed.): *The SAGE Handbook of Intercultural Competence*. London: SAGE, 362– 373.

Engineering Council (2020) *The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC)*, 4th ed. 31 August 2020 <https://www.engc.org.uk/media/3877/uk-spec-v12-web.pdf>

Morgan, M. and O’Gorman, P. (2011) “Enhancing the Employability Skills of Undergraduate Engineering Students”, Chapter 18, *Innovations*, August 15.

National Academy of Engineering (2005) *The Engineer of 2020: Adapting Engineering Education to the New Century.*, Washington D.C.: The National Academies Press.

Neidert, C. (2011) “Sheltered Program at the Technische Universität Braunschweig, Germany. Facilitating Studying and Working Abroad: Best Practices,” *Online Journal for Global Engineering Education*, 6(1), 3.

Okoroafor, E.R., Offor, C.P. and Prince, E.I. (2022) “Mapping Relevant Petroleum Engineering Skillsets for the Transition to Renewable Energy and Sustainable Energy”. *SPE Nigeria Annual International Conference and Exhibition* held in Lagos, Nigeria, 1 - 3 August 2022.

Onwuka, E. N. (2009) “Reshaping Engineering Education Curriculum to Accommodate the Current Needs of Nigeria” *Educational Research and Review* 4(7): 334-339.

Widiawan, K. (2008) “Identifying the Most Suitable University-Industry Partnership Model in Developing Countries”, *4th IEEE International Conference on Management of Innovation and Technology*, 21–24 September, 128 - 133.

CONTACT INFO

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Bassey Bassey	United Kingdom	Cranfield University	Danbass82@yahoo.com
ThankGod Egbe	Nigeria	CypherCrescent Limited	thankgod.egbe@cyphercrescent.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: The Impact of a Modified Quadruple Helix on Establishing Timor-Leste's Innovation Ecosystem

TYPE: (a. original research)

TRACK: Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE: This research examines the development of Timor-Leste's innovation ecosystem through the lens of a modified Quadruple Helix model, where international organizations emerge as pivotal third-sector participants. Amidst Timor-Leste's innovation capacity challenges, this unique adaptation illustrates how cross-sector collaboration accelerates ecosystem maturity. Highlighting international organizations' roles, this work showcases their impact on fostering innovation in low-capability settings, offering insights into leveraging global partnerships for local innovation advancements. Through this study, we contribute to the discourse on implementing the Triple Helix model in contexts where traditional sector roles are expanded, thereby enriching the understanding of innovation ecosystems in emerging economies.

DESIGN/METHODOLOGY/APPROACH: This study employs a qualitative research design, integrating fieldwork observations and interviews within Timor-Leste's innovation ecosystem. By analyzing the interactions among government, academia, industry, and international organizations, we identified how these interactions contribute to the ecosystem's development. The methodology focuses on implementing the modified Quadruple Helix model, emphasizing the unique role of international organizations. Through thematic analysis, we extract insights into collaborative innovation processes, assessing their effectiveness in addressing local challenges and enhancing Timor-Leste's innovation capabilities.

FINDINGS OR EXPECTED OUTCOMES: Our efforts uncovered how integrating international

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

organizations within Timor-Leste's modified Quadruple Helix framework accelerates the nation's innovation ecosystem. We identified successful collaboration models between sectors, insights on overcoming innovation barriers in low-capability environments, and strategies that leverage international partnerships for local development. This study contributes to the global understanding of innovation ecosystems in emerging economies. It provides a roadmap for similar nations seeking to enhance innovation capabilities through inclusive, collaborative frameworks.

ORIGINALITY/VALUE: This study pioneers by exploring Timor-Leste's incipient innovation ecosystem through the lens of a modified Quadruple Helix model, where international organizations play a crucial role. It delves into the underexplored yet potentially vibrant innovation landscape of a nation with significant growth potential. By integrating global partnerships into local innovation strategies, this research offers fresh insights into collaborative efforts to enhance innovation capabilities in contexts of limited resources, providing valuable perspectives for policymakers, international bodies, and academics focused on innovation dynamics in emerging economies.

PRACTICAL/SOCIAL IMPLICATIONS: This research outlines significant practical and social implications for Timor-Leste and the global community. For Timor-Leste, it highlights the transformative potential of collaborative innovation models in catalyzing socio-economic development, suggesting pathways for leveraging international partnerships to build a resilient and dynamic innovation ecosystem. Globally, it presents a model for other developing nations to integrate international organizations into their innovation strategies, potentially shaping global innovation policy and fostering a more inclusive approach to addressing innovation challenges in emerging economies. This study underscores the importance of multi-stakeholder collaboration in advancing local and international innovation agendas.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This research opens avenues for further investigation into the broader application and scalability of the modified Quadruple Helix model in other emerging economies, exploring its potential as a universal framework for innovation acceleration. Further studies could delve into longitudinal impacts on socio-economic development, comparing across nations to refine collaborative innovation strategies. A limitation of this study is its focus on Timor-Leste,

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

which, while providing in-depth insights, may not capture the full diversity of challenges and opportunities present in different contexts. Expanding research to include a variety of emerging economies would enhance the framework's applicability and effectiveness.

KEYWORDS (3-5): Timor-Leste, Quadruple Helix, International Organizations, Emerging Economies, Innovation Ecosystems.

REFERENCES:

Carayannis, E. and Campbell, D. 'Mode 3' and 'Quadruple Helix': towards a 21st-century fractal innovation ecosystem. *International Journal of Technology Management*, Vol.46, No.3/4, pp.201 - 234, 2009.

Couto, F. and Guterres, J. O plano estratégico do Instituto Nacional de Ciências, Inovação e Tecnologia de Timor-Leste - Horizonte para as ciências, tecnologia e inovação até 2030. *Revista de Ciências e Tecnologia de Timor-Leste*, n.1, pp. 11-38, 2022.

Gil, A.C. Como elaborar projetos de pesquisa. 19. Ed. São Paulo: Atlas, 1991. 159p.

Guterres, J., Ximenes, V., Soares, A., Correia, M., Sousa, J., Rangel, G., Xavier, L., Guterres, J., Couto, F., Correia, C. INCT Strategic Plan 2022-2030. Dili: INCT, 2022.

Lacerda, C., Balliano, T., Vasconcellos, A. Indicações Geográficas Na Região Do Baixo São Francisco: Prospecção De Campo Para Avaliação Do Potencial Para Novos Reconhecimento, Com Destaque Para A Ilha Do Ferro. *The Lower São Francisco: Environmental and Social Characteristics*. Maceió: v.2, chap. 21, 415-433, 2022.

OACPS Policy Support Facility. PSF Policy Recommendation Report for developing an STI policy framework and a National Digital Repository in Timor-Leste. Brussels: 2022.

Rath, A. Science, Technology, and Innovations for SDGs: Timor-Leste. United Nations Technological Bank (UNTB), UNESCO, 2020.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Thiollent, M. Metodologia de pesquisa-action. São Paulo: Cortez, 1985.

WORLD BANK. Timor-Leste - Public Expenditure Review: Macro Economic Performance. 2021.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Thiago Negrão Chuba	Japan	Kyoto University	negraochuba.thiago.d45@kyoto-u.jp
Gabriela Simões Pazelli	Brazil	Universidade Federal de São Paulo (Unifesp)	gabriela.pazelli@unifesp.br
Kei Saito	Japan	Kyoto University	saito.kei.1y@kyoto-u.ac.jp

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: University alliances: lessons learned from the Alliance for Innovation in Porto Alegre, RS - Brazil

TYPE: Original Research.

TRACK: 5. Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE: There are many ways to explore the contribution of universities to development of innovation ecosystems according to the context of the country, resources of a specific region and socio-cultural characteristics (Schiuma, Carlucci, 2018; Reichert, 2019; Thomas, Faccin, Asheim, 2021; Gu, Hu, Zhang, Hou, 2021; Meetei, Bhattacharjya, Bhowmick, 2024). A useful framework for capturing the complex composition of actors and processes taking place in an innovation ecosystem is identifiable in the Triple Helix Model (Etzkowitz, 2004). This article explore the emerging role of universities in contemporary society through third mission activities (Etzkowitz, Webster, Gebhardt, Terra, 2000). Together with teaching (first mission) and researching (second mission), the third mission concept represents the economic and social mission of the university and its contribution to communities and territories (Compagnucci, Spigarelli, 2020). In particular, the paper investigates the potential contributions that universities can offer to society through alliances among them (Deiaco, Gren, Melin, 2009; Vukasovic, Stensaker, 2018; Maassen, Stensaker, Rosso, 2023).

DESIGN/METHODOLOGY/APPROACH: The research strategy adopted is a case study based on the epistemological approaches of Yin (1994, 2015), Eisenhardt (1989, 2007) and Stake (1995). The case study presents multiple third mission activities carried out by the Alliance for Innovation, created from the collaboration between the Universities PUCRS, UFRGS and UNISINOS. The activities are framed according to the role of universities could have in the development of innovation ecosystems according to the context of the Brazil, resources of the region of Porto Alegre, RS - Brazil and its socio-cultural

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

characteristics (leads the ranking of the best cities in the country to do business, according to the 2022 Municipal Competition Index of the Ministry of Economy; and is the second best Brazilian capital for undertake, according to a study carried out last year by Enap and Endeavor.)

FINDINGS: Within third mission activities, universities alliances can play different and broader roles (generative, absorptive, collaborative and leadership) as multi-dimensional meta-organizations.

ORIGINALITY/VALUE: This case study captures university alliances' contributions to development of innovation ecosystems by orchestrating a journey of social innovation that enables new interventions and social spaces, as well as solutions arising from community learning.

PRACTICAL/SOCIAL IMPLICATIONS: The paper shows the important contributions that university alliances can make in their regions, both to support the development of innovation ecosystems and the community building. Emphasises university alliances' multiple contributions to innovation, by highlighting their transformational effect on regional economies look at community building within the local culture.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: In the following, we outline selected directions for future research that emerges from our discussion on potential contributions that universities can offer to society through alliances among them. First, more research is needed on about the understanding of university alliances as multi-dimensional meta-organizations. Second, future research is needed on community building and community learning and their implications to development of innovation ecosystems. Third, the perception of a wider innovation paradigm, in which collaborative arrangements such as university alliances and the transformational effect generated on regional economies are treated as social innovations. Study limitations are related to the research strategy adopted, as case studies are not generalizable to the population (statistical generalization); however they can be used to expand and generalize theories (analytical generalization) to further describe applications to practice. Still, it is important to highlight the limitations of this study related to the theoretical framework adopted and the empirical context explored.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

KEYWORDS (3-5): Community Building, Community Learning, Innovation Ecosystems, Social Innovation, Triple Helix Model.

REFERENCES

- Compagnucci, L., & Spigarelli, F. (2020). The Third Mission of the university: A systematic literature review on potentials and constraints. *Technological Forecasting and Social Change*, 161, 120284.
- Deiaco, E., Gren, A. M., & Melin, G. (2009). Exploring university alliances and comparable academic cooperation structures. In *Learning to compete in European universities*. Edward Elgar Publishing.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management Review*, 14(4), 532-550.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25-32.
- Etzkowitz, H., Webster, A., Gebhardt, C., & Terra, B. R. C. (2000). The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm. *Research policy*, 29(2), 313-330.
- Gu, Y., Hu, L., Zhang, H., & Hou, C. (2021). Innovation ecosystem research: Emerging trends and future research. *Sustainability*, 13(20), 11458.
- Maassen, P., Stensaker, B., & Rosso, A. (2023). The European university alliances—an examination of organizational potentials and perils. *Higher Education*, 86(4), 953-968.
- Meetei, L. A., Bhattacharjya, B. R., & Bhowmick, B. (2024). The Role of Universities in the Innovation Systems in the Developing Countries. *Foresight and STI Governance*, 18(1), 58-67.
- Reichert, S. (2019). The role of universities in regional innovation ecosystems. *EUA study, European University Association, Brussels, Belgium*.
- Schiama, G., & Carlucci, D. (2018). Managing strategic partnerships with universities in innovation ecosystems: A research agenda. *Journal of Open Innovation: Technology, Market, and Complexity*, 4(3), 25.
- Stake, R. E. (1995). The art of case study research. California, USA: Sage.
- Thomas, E., Faccin, K., & Asheim, B. T. (2021). Universities as orchestrators of the development of regional innovation ecosystems in emerging economies. *Growth and change*, 52(2), 770-789.
- Vukasovic, M., & Stensaker, B. (2018). University alliances in the Europe of knowledge: Positions, agendas and practices in policy processes. *European Educational Research Journal*, 17(3), 349-364.
- Yin, R. K. (2015). Estudo de Caso: Planejamento e métodos. Porto Alegre: Bookman.
- Yin, R., (1994). Case study research: Design and methods (2nd ed.). Beverly Hills, CA: Sage Publishing.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Silvio Bitencourt da Silva	Brazil	UNISINOS	sibitencourt@unisin.br
Santiago Uribe Rocha	Colômbia	Medelin Resiliente	santiagouribe@medelinresiliente.co

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Expanding the reach of active mobility through the promotion of sustainable transport and inclusive infrastructure development in the living lab of the University City of Federal University of Rio de Janeiro

TYPE: Practical case/experience analysis

TRACK: Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE:

Cities are key elements for sustainable development, given the relevance and impact caused by these spaces on economical, social, environmental, technological, and cultural changes. Thus, intermediation between the interests of society, academic institutions, public organizations, and private companies is essential, with the intention to renew management practices and develop complex urban projects, which makes it necessary to implement measures aimed at the well-being of communities (GASCÓ, 2017; FØLSTAD, 2008). This approach allows the integration between relevant sectors of society regularly, aiming to meet the needs of interested parties and obtain the maximum impact during the planning, implementation, evaluation and feedback (NESTEROVA and QUAK, 2016).

Aligned with the Sustainable Development Goal (SDG) 11 shared bike systems emerge as contributors to improving the quality of life in cities and communities through the promotion of sustainable transport and also encouraging active transportation.

In Brazil, the Federal University of Rio de Janeiro plays a leading role, for this reason, a living urban laboratory was established, with a quadruple helix structure, for the implementation of an active and sustainable mobility project through a *dockless* system of shared bicycles, prioritizing the social point of view in the measures implemented on campus.

It is important to emphasize that university cities comprise a significant number of people and loads that

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

circulate within their campuses. In University City, at the Federal University of Rio de Janeiro, 100,000 people circulate daily, including students, professors, technicians, civil servants and employees of companies installed within the campus (UFRJ, 2022). The idea of a university city provides integration between academia, industry, innovation, and government, an integration that is supported by Sustainable Development Goal 9, which aims to build resilient infrastructure, develop an inclusive and sustainable industry and grow innovation processes.

The pilot project in the living lab of the Federal University of Rio de Janeiro aims to promote active and sustainable mobility in the area, through the implementation of a bicycle-sharing system without the need for fixed stations. The project includes developing and evaluating the system in a controlled environment, intending to identify problems and opportunities before its full-scale implementation.

The results show that the system has been successful in promoting active and sustainable mobility, but also points to some areas for improvement, such as the need to improve the usability and availability of bicycles. The project has been carried out with the collaboration of the university community and was designed as an experimental environment to assess the viability and adaptability of the system in the urban context of University City.

Although a multiplier effect is expected, spreading the culture of sustainability beyond geographic borders, this environment has several particularities. The article, through an evaluation of the practical project, is intended to discuss the identification of opportunities, user acceptance, challenges and critical issues for the use of bike sharing-systems, and the promotion of active mobility to achieve the Sustainable Development Goals, especially the 9 and 11.

DESIGN/METHODOLOGY/APPROACH:

Qualitatively analyze the bike sharing-system that currently operates in the living urban laboratory of University City, the largest campus of the Federal University of Rio de Janeiro, in order to identify the aspects that contribute to the promotion of a more sustainable environment in order to achieve the Objectives of Sustainable Development 3, 9 and 11 of the United Nations Agenda.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

FINDINGS OR EXPECTED OUTCOMES:

Achieve a decrease in the use of motor vehicles to short distances within the campus to contribute to a more sustainable and healthier environment for the society that circulates in University City. In addition to stimulating the integration between means of transportation to improve access within the travel generating hubs areas of the University City, in this way, promoting active transport and improving means of transport availability for the users. Between the challenges faced during the implementation of the projects the main one was the security of the vehicle, so the solution to reduce the risks of theft was the creation of areas for virtual dock stations in the campus, furthermore there were some adjustments made between the needs company providing the service and academic research group for the co-creation of the operating system.

ORIGINALITY/VALUE:

Analyze the University City of the Federal University of Rio de Janeiro as a living lab in order to promote and encourage the use of active mobility through the use of the bike sharing-system, meeting the needs of the university campus, not only as one more commuting option, but as a mean of stimulating actions that contribute to the improvement of the environment and that help in the user's quality of life.

PRACTICAL/SOCIAL IMPLICATIONS:

As a social implication, this study's main focus is to provide a quality of life to society that uses the bike sharing-system, not just as another means of transportation, but as a way to promote social integration and entrepreneurship, besides the promotion of a healthy life through physical activities related to bicycle use.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

One of the main limitations of this project is that the geographic location of the university, being an island with limited access, including the lack of multimodality and with difficult transport integration, leads to very specific characteristics that cannot easily be found in other universities cities, which leads to a need to apply the bike sharing-system in other scenarios for a better understanding of its replicability.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

KEYWORDS (3-5)

bike sharing-systems; living lab; active mobility; Sustainable Development Goals (SDG)

REFERENCES

Universidade Federal do Rio de Janeiro - UFRJ. Fatos e números, 2022. Acesso em 30 de Janeiro de 2023. Disponível em: <https://ufrj.br/aceso-a-informacao/institucional/fatos-e-numeros/>

FØLSTAD, A. Living labs for innovation and development of information and communication technology: a literature review. The Electronic Journal for Virtual Organizations and Networks, v. 10, p. 99-131, 2008.

GASCÓ, M. Living labs: implementing open innovation in the public sector. Government Information Quarterly, v. 34, n. 1, p. 90-98, jan, 2017.

NESTEROVA, N.; QUAK, H. A city logistics living lab: a methodological approach. Transportation Research Procedia, v. 16, p. 403-417, 2016.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Lorena Mirela Ricci	Brazil	UFRJ	lorena.ricci@pet.coppe.ufrj.br
Gabriel Bezerra Costa de Lima	Brazil	UFRJ	gabrielbcdelima@poli.ufrj.br
Fernanda de Miranda Maio	Brazil	UFRJ	maio.fernanda@pet.coppe.ufrj.br
Mariana Marques de Moraes	Brazil	UFRJ	mariana@coppe.ufrj.br
Helena Oliveira	Brazil	UFRJ	helenaoliveiraf.20221@poli.ufrj.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Filagrana			
Lino Guimarães Marujo	Brazil	UFRJ	lino@pep.ufrj.br
Márcio de Almeida D'Agosto	Brazil	UFRJ	dagosto@pet.coppe.ufrj.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: TECHNOLOGY PARKS AS PROMOTERS OF SUSTAINABLE INNOVATION FROM THE PERSPECTIVE OF THE FIVE HELIX: CASE STUDY OF THE BELO HORIZONTE TECHNOLOGY PARK

TYPE a. original research

TRACK: Triple Helix Model in Practice around the world - Implementing the Triple Helix Model for Real-World Impact

PURPOSE:

This work aims to primarily analyze the evolution of technology parks' protagonism in promoting the development of sustainable technologies and to better understand the innovation ecosystem directed towards promoting sustainability in Brazil and analyze how the theoretical assumptions interact in reality, presenting a case study of the establishment of the Sustainability Intelligence Center at the Belo Horizonte Technology Park.

As specific objectives, it seeks to Promote a Systematic review of the sustainable development and SDGs, understand the NIS - National Innovation System in Sustainability from the perspective of the quintuple helix; analyze the individual contribution and current status of each of the 5 actors considered; present the case study of the Sustainability Intelligence Center of the Belo Horizonte Technology Park; analyze the plans and potential contributions of the SIC/BH-TEC over the next decade, and finally, the predicted trends for the development of the topic in Brazil and worldwide over the coming years.

DESIGN/METHODOLOGY/APPROACH:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

The chosen methodology is the quintuple helix. Understanding its predecessor theory, the triple helix is key to comprehending its premisses. Therefore, a preliminary literature review will be conducted on the concept of the triple helix to subsequently introduce the quintuple helix.

Considering the importance of conducting studies supported by the quintuple helix model, the research also aims to analyze the evolution of the association between sustainability and innovation, qualitatively examining the involvement of each of the development-promoting agents considered using the chosen methodology: Government, businesses, universities, civil society, and the environment.

FINDINGS OR EXPECTED OUTCOMES:

The expected impact of this project relates to its contribution to the theoretical framework of the intersections and influences of the innovation ecosystem in Brazil, as well as the development and application of sustainable practices. Furthermore, it is expected that, based on the analyzed theoretical conclusions, the developed framework can be applied to case studies in real initiatives, such as the case of the Sustainability Intelligence Center at the Technology Park of Belo Horizonte.

The expected economic impact is for this work to serve as a foundation for other innovation hubs aiming to invest in promoting structured and coordinated sustainability initiatives. It also aims to provide inputs to governments at different levels so they can better understand the various actors involved in the innovation process and empower them through acceleration programs and continuous education, allowing for better integration between innovation promoters and, consequently, optimizing public and private investment in sustainability in the country.

The expected social impact aims to promote greater knowledge about the status of technology development focused on sustainability in the country, as well as to popularize theoretical analyses not yet available in Portuguese on the subject. The work also aims to engage in dialogue with other academic productions and entities to promote the expansion of initiatives focused on sustainability.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

ORIGINALITY/VALUE:

In an increasingly connected and interdependent world, technological innovation is gaining prominence. Within this context, it is essential to shed light on the impact of technological innovations on essential issues for the proper functioning of life in society such as health, security, inequality, education, and sustainability. The early stages of technology's application to sustainable development, paired with the swift digitization the world has undergone over the last decade, solidify fertile ground for the topic's emerging relevance.

The relevance of further studies related to the role of technology parks as promoters of sustainable initiatives is justified due to their significant potential to serve as drivers for sustainable development, acting as "*(...) facilitators of knowledge and innovation,*" and the limited literature on this role and existing initiatives to promote sustainability in technology parks. (LAGUNA; DURÁN-ROMERO, 2017).

Further understanding and dissemination of the promoters of sustainability-focused innovation are also beneficial from the perspective of sustainable economic development, given the importance of the subject for promoting economically viable and socially just growth in countries. Among the most recognized initiatives led by governments to promote environmentally responsible economic and social projects, the establishment of 17 Sustainable Development Goals - SDGs in 2015 by all 193 member countries of the United Nations (UN) stands out. In this sense, the role of government proves central to understanding economic, social, and economic development. (ASSEMBLY, 2015).

PRACTICAL/SOCIAL IMPLICATIONS:

The work aims to contribute to a better understanding of the Brazilian Innovation Ecosystem in Sustainability and its relevance for promoting sustainable practices and innovations, as well as to

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

contribute to the debate about the different possibilities for Technology Parks to foster sustainable innovation.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Amidst the limitations of this study, it can be emphasized the confined scope of the research of the existent initiatives within technological parks, given it was conducted through desk research and subject to proper updates of the resources in each park's website. Besides that, the interactions between the different actors are intricate and numerous, so it is essential do acknowledge that the ones mentioned in the study are some of the most relevant and recurrent ones but not exhaustive.

For enhanced comprehension of the role of technological parks initiatives related to sustainable innovation, it is recommended to further research different projects undertaken by technological parks in Brazil to foster sustainability by interview or other means of research besides desk research; to promote comparison between different initiatives in other countries and regions; to further estimate the impacts of such initiatives in the innovation function and on innovation itself - e.g. by filtering patents required by actors impacted by these programs as a proxy, and finally to follow, document and further understand the evolution and next steps of the Sustainability Intelligence Center at the Belo Horizonte Technology Park.

KEYWORDS (3-5): Sustainability, Sustainable Development, Triple helix, Quintuple helix, Technology Parks

REFERENCES:

ASSEMBLY, General. Resolution adopted by the General Assembly on 11 September 2015. **New York: United Nations, 2015.**

CHASEK, Pamela. Stockholm and the birth of environmental diplomacy. **International Institute for Sustainable Development, 2020.**

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CHASEK, Pamela. The legacies of the Stockholm Conference. **International Institute for Sustainable Development**, 2022.

CORREIA, Ana Maria Magalhães; GOMES, Maria de Lourdes Barreto. Habitat's de inovação na economia do conhecimento: identificando ações de sucesso. **RAI Revista de Administração e Inovação**, v. 9, n. 2, p. 32-54, 2012.

DA SILVA, Izabela Souza et al. HÉLICE QUÍNTUPLA, INOVAÇÃO E DESENVOLVIMENTO SUSTENTÁVEL: UMA ANÁLISE SISTEMÁTICA. In: **11th International Symposium on Technological Innovation**. 2021

EXECUTIVO, CGEE Sumário. The Brazilian innovation system: a mission-oriented policy proposal. **Brasília: Centro de Gestão e Estudos Estratégicos**, 2016.

EDQUIST, Charles. Systems of innovation perspectives and challenges. **African Journal of Science, Technology, Innovation and Development**, v. 2, n. 3, p. 14-45, 2010.

FAGERBERG, Jan et al. (Ed.). **The Oxford handbook of innovation**. Oxford university press, 2005.

HAMADEH, N.; ROMPAEY, C.; METREAU, E. World Bank Group country classifications by income level for FY24 (July 1, 2023-June 30, 2024). 2024.

HUGGINS, Robert; PROKOP, Daniel; THOMPSON, Piers. Universities and open innovation: The determinants of network centrality. **The Journal of Technology Transfer**, v. 45, p. 718-757, 2020.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

IMPERATIVES, Strategic. Report of the World Commission on Environment and Development: Our common future, 1987

KNEIPP, Jordana Marques et al. Sustainable innovation practices and their relationship with the performance of industrial companies. **Revista de Gestão**, v. 26, n. 2, p. 94-111, 2019.

KOLOMYTSEVA, Olena; PAVLOVSKA, Anna. The role of universities in the national innovation system. **Baltic Journal of Economic Studies**, v. 6, n. 1, p. 51-58, 2020.

KUMAR, Sanjiv; KUMAR, Neeta; VIVEKADHISH, Saxena. Millennium development goals (MDGS) to sustainable development goals (SDGS): Addressing unfinished agenda and strengthening sustainable development and partnership. **Indian journal of community medicine**, v. 41, n. 1, p. 1-4, 2016.

LAGUNA, Nuria E.; DURÁN-ROMERO, Gemma. Science parks approaches to address sustainability: A qualitative case study of the science parks in Spain. **International Journal of Social Ecology and Sustainable Development (IJSESD)**, v. 8, n. 3, p. 38-55, 2017.

LEE, Keun. How can Korea be a role model for catch-up development? A 'capability-based' view. **Achieving development success: Strategies and lessons from the developing world**, v. 25, n. 34, p. 1-24, 2013.

LEE, Keun; IM, Buru; HAN, Junhee. The National innovation system (NIS) for the catch-up and post-catch-up stages in South Korea. In: **The Korean Government and Public Policies in a Development Nexus**. Springer, Cham, 2017. p. 69-82.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

MAZZUCATO, Mariana. **O estado empreendedor: desmascarando o mito do setor público vs. setor privado.** Portfolio-Penguin, 2014.

MAZZUCATO, Mariana; PENNA, Caetano. The Brazilian innovation system: a mission-oriented policy proposal. **Brasília: CGEE**, 2016.

MINEIRO, Andréa AC et al. Da Hélice tríplice a quintupla: uma revisão sistemática. **Economia & Gestão**, v. 18, n. 51, p. 77-93, 2018.

MUNASINGHE, Mohan. **Environmental economics and sustainable development.** World Bank Publications, 1993.

MUNASINGHE, Mohan. COVID-19 and sustainable development. **International Journal of Sustainable Development**, v. 23, n. 1-2, p. 1-24, 2020.

PAUS, Eva. Latin America and the middle-income trap. 2017.

PURCELL, Wendy Maria; HENRIKSEN, Heather; SPENGLER, John D. Universities as the engine of transformational sustainability toward delivering the sustainable development goals: “Living labs” for sustainability. **International Journal of Sustainability in Higher Education**, v. 20, n. 8, p. 1343-1357, 2019.

RAUTER, Romana et al. Open innovation and its effects on economic and sustainability innovation performance. **Journal of Innovation & Knowledge**, v. 4, n. 4, p. 226-233, 2019.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

SACHS, Jeffrey D. et al. Sustainable development report 2022. **Cambridge University Press**, 2022.

SACHS, Jeffrey D. et al. Sustainable Development Report 2023. **Dublin University Press**, 2023.

SERAGELDIN, Ismail. Making development sustainable. **Finance and development**, v. 30, n. 4, p. 6-10, 1993.

UN, U. N. Report of the United Nations conference on the human environment. 1972.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Elise Hungaro da Cunha	Brazil	UFMG	elisehungaro@gmail.com

06

Government Policies and Governance for Impactful Innovations

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: SOCIAL ENTREPRENEURSHIP AND FEMALE ENTREPRENEURSHIP: FROM PUBLIC POLICIES TO SUPPORT NETWORKS

TYPE: Original Research

TRACK: Social entrepreneurship and community-driven initiatives

PURPOSE: In the spectrum of investigations related to social entrepreneurship, a growing number of studies are presented aimed at understanding the role of female entrepreneurship as a contributing factor to leveraging the emergence of support networks and public policies that aim to correct asymmetries related to gender inequality and violence domestic. These themes are linked to the United Nations (UN) Sustainable Development Goal (SDG 2030) number 5, which establishes achieving gender equality and empowering all women and girls.

In view of the introductory considerations, this article aims to identify public policies and collaboration networks that aim to assist female entrepreneurship in the State of Ceará.

The choice of the State of Ceará is due to the promotion of innovative actions related to state public policies aimed at protecting women and promoting female entrepreneurship.

DESIGN/METHODOLOGY/APPROACH: To collect data, we searched for information (legislation, program and projects) on the Ceará State Government website, through the Women's Secretariat page. At the same time, the use of online search engines was adopted through the use of keywords: women's support network, Women's Room in the State of Ceará, women's support association, social entrepreneurship; ceará and female entrepreneurship; Ceará. The systemization of the information collected occurred through the triangulation of methods (MINAYO, ASSIS & SOUZA, 2005).

FINDINGS OR EXPECTED OUTCOMES: Data analysis allowed us to verify that the promotion of female entrepreneurship in the State of Ceará is developed within the framework of Law No. 17,170 of D.O.E of 02/09/2020, which creates the Ceará Council for Women's Rights – CCDM, a collective deliberation body, linked to Secretariat of Social Protection, Justice, Citizenship, Women and Human Rights.

The implementation, monitoring and evaluation of public policies that aim to guarantee women's human rights, within the scope of domestic and family relationships, occurs through the Women's Secretariat established by Law 18,310 of 02/17/2023. At the heart of these actions is the Ceará *Por Elas* Program (PCE), which consists of a joint effort by the State Government of Ceará in partnership with municipalities to implement and strengthen public policies for women with the aim of promoting interinstitutional integration. for the articulated development of strategies aimed at implementing and expanding these policies in the municipalities of Ceará through unified guidelines. In February 2024, the PCE had a

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

partnership with 100 municipalities in Ceará.

The PCE is divided into three axes: Safe Woman, Protagonist Woman and Entrepreneurial Woman. The latter two are focused on social participation, management and entrepreneurship, seeking to insert women into the job market. Regarding the Entrepreneurial Woman axis, three axis stand out: 1 – Creation or strengthening of the entrepreneur room; Holding Women Entrepreneurial Fairs or Corridors and 3 – Continuous training for women in the job market. These seek to develop women's economic autonomy, enabling the strengthening of female entrepreneurship, training opportunities and professional qualifications, access to the job market and guidance on microcredit.

Ceará currently has four integrated equipment specialized in protecting women who are victims of violence. One of them is the Casa da Mulher Brasileira (CMB), located in Fortaleza and federally managed. Following this national experience, the State of Ceará implemented three Casas da Mulher Cearense (CMC) located in the municipalities of Juazeiro do Norte, Sobral and Quixadá. Other CMC units are being built in Iguatu, Crateús and Tauá and three more are in the process of being created in Itapipoca, Limoeiro do Norte and São Benedito.

The equipment houses the Women's Defense Police Station, Domestic and Family Violence Against Women Court, Public Prosecutor's Office and Public Defender's Office, as well as Municipal and State Reference Centers that offer psychosocial care. The house offers professional training courses within the Promotion of Economic Autonomy.

In public-private partnerships, it is worth mentioning the non-profit organization Rede Mulheres Empreendedoras, which operates in several states, with projects that aim to empower women, guarantee financial independence and decision-making in business. Specifically, in the State of Ceará, the Network of Sustainable Women Entrepreneurs (REMES), the Environmental Interest Group – GIA and the Coletivo SemHoras stand out, which seek to promote workshops, training and debates in order to increase women's participation in the economic and social, with female entrepreneurship as a powerful tool for interaction between the creative economy, social and environmental entrepreneurship.

ORIGINALITY/VALUE: It presents government actions and public-private partnerships aimed at promoting female entrepreneurship and support networks for women in the State of Ceará.

PRACTICAL/SOCIAL IMPLICATIONS: Identifies public policies aimed at female entrepreneurship linked to social entrepreneurship

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Analyze the socioeconomic profile and the characteristics and entrepreneurial motivations of women assisted by the public policies and networks mentioned in this work.

KEYWORDS (3-5): Gender equality; Public Management; SDG

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

REFERENCES

MINAYO, M. C.S, ASSIS, S. G., SOUZA, E. R **Avaliação por Triangulação de Métodos: Abordagem de Programas Sociais**. Rio de Janeiro: Editora Fiocruz; 2005. 244 pp.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Joanna Sthefanny Gomes Costa dos Santos	Brazil	Universidade Federal do Ceará	joana12costa95@gmail.com
Amanda Gomes Oliveira	Brazil	Universidade Estadual Vale do Acaraú	amandagomesfnm@gmail.com
Elzilene Gomes Costa	Brazil	Universidade Estadual Vale do Acaraú	elzileneadvogada@gmail.com
Benedita Marta Gomes Costa	Brazil	Universidade Estadual Vale do Acaraú	martagcosta578@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (minimum 500 words, maximum 1000 words)

TITLE: Regulatory Changes for Economies of Scale in Carbon Capture in Brazil.

TYPE: a. original research.

TRACK: Theme 6 - Government Policies and Governance for Impactful Innovations

PURPOSE: Economies of scale play a fundamental role in the economic viability of carbon capture, as they can significantly influence the costs associated with this technology. Substantial reductions in the costs of capturing and transporting captured carbon are crucial to making Carbon Capture and Storage (CCS) economically attractive and driving investment in this area (Cranga, 2022). The high initial investments and operational costs represent more than half of the total cost, contributing to the slow adoption of the technology. However, as the technology matures, financial costs decrease and experience in the construction and operation of CCS facilities increases, which can make carbon capture more accessible. Nevertheless, challenges such as capital intensity, the lack of intrinsic value of CO₂, and technological and regulatory uncertainties hinder scalability. The absence of a comprehensive regulatory regime to govern underground CO₂ injection is also highlighted as an additional challenge. Ultimately, the complexity of the value chain requires collective action among different commercial entities with divergent risk attitudes, which can lead to investment standstills (Rai, Victor & Thurber, 2009; Hu, Pan & Huang, 2020). Overcoming these regulatory gaps requires measures, including international harmonization, establishment of guidelines for pipeline reuse, and implementation of Safety Case legislations. Additionally, existing regulatory frameworks can be enhanced through integration with operational standards and recommended practices from standardizing organizations (e.g., Det Norske Veritas and International Organization for Standardization) (El-Kady, Amin, Khan & El-Hawagi, 2024). In Brazil, the focus of this research, there is a legislative process for the approval of the Legal Framework for Carbon Capture and Storage Activities (Bill 1425/2022) aiming to comply with best practices and advance

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

this economic activity in the country. The text establishes, among other points, that: permanent gas storage must occur in national subsurface (territorial sedimentary basins or in the sea); the Government will disclose the list of reservoirs eligible for concession; oversight of the activity will fall under the responsibility of the National Agency of Petroleum, Natural Gas, and Biofuels (ANP). Therefore, this research aims to understand how this regulatory framework and both direct and indirect administrative entities can contribute to (or hinder) the scalability gains of this sector. To achieve this goal, the research will draw on theories from institutional economics (North, 1991), regulation (Djankov, 2009; Djankov, La Porta, Lopez-de-Silanes & Shleifer, 2002), and innovation (Blind & Munch, 2024) to analyze the text of the carbon capture regulatory framework and the role of public agents (both current and those addressed in the bill's text) in this process.

DESIGN/METHODOLOGY/APPROACH: This study proposes a descriptive, qualitative, and documentary investigation on a current bill related to carbon capture regulation. The aim is to understand how this bill may influence the sector's development, highlighting the role of public agents involved in the legislative process. The approach will be descriptive, aiming to comprehend the content and objectives of the bill. A qualitative analysis of relevant legal documents, such as the bill text and related documents, will be conducted. Additionally, semi-structured interviews will be held with designated public agents and environmental policy experts. The collected data will be qualitatively analyzed using content analysis techniques. Recurring themes, patterns, and trends will be identified in the legal documents and interviews.

FINDINGS OR EXPECTED OUTCOMES: The objectives of this research are to analyze the content and objectives of the current bill related to carbon capture; investigate how designated public agents are involved in the legislative process and how they influence the formulation and approval of the bill; and identify potential benefits and challenges associated with the implementation of the bill for the carbon capture sector. It is expected that this study will provide an in-depth understanding of the current bill related to carbon capture, highlighting the role of designated public agents. The results may contribute to the development of more effective policies and the promotion of sustainable growth in the carbon capture sector.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

ORIGINALITY/VALUE: The uniqueness of this research lies in the multifaceted approach adopted to understand the impact of a current bill on carbon capture. Firstly, the research adopts a descriptive, qualitative, and documentary perspective, enabling a comprehensive analysis of the content and objectives of the bill, as well as the role of public agents in the legislative process. Additionally, data analysis will involve both legal documents and interviews with designated public agents and environmental policy experts, providing a holistic view of the implications of the bill for the carbon capture sector.

PRACTICAL/SOCIAL IMPLICATIONS: By addressing issues related to the regulation and governance of this emerging industry, this research aims to fill a gap in the literature and provide valuable insights for the development of more effective policies and the sustainable advancement of the carbon capture sector in Brazil.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Future directions for this research may include expanding the scope to investigate the impact of the bill on carbon capture in jurisdictions beyond Brazil, enabling international comparisons and a more comprehensive understanding of carbon policies at a global level. Regarding limitations, a potential constraint of this research is the availability and accessibility of data, especially regarding legal documents and the participation of public agents in interviews. Additionally, since this research is based on qualitative methods, there may be challenges in ensuring objectivity and generalizability of the results. Another potential limitation is the dynamic nature of the legislative environment, which may result in significant changes to the bill during the research.

KEYWORDS (3-5): regulation, carbon capture, governance, economies of scale.

REFERENCES

Agência Câmara de Notícias. (2023). Comissão aprova marco legal das atividades de captura e armazenamento de carbono.

<https://www.camara.leg.br/noticias/1022007-comissao-aprova-marco-legal-das-atividades-de->

Blind, K.; Munch, F. The interplay between innovation, standards and regulation in a globalizing economy. *Journal of Cleaner Production*, 445, 141202. <https://doi.org/10.1016/j.jclepro.2024.141202>.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Cranga, S. Scale Economies in the CO₂ Capture: A Key Factor for a Successful Energy Transition. *16th International Conference on Greenhouse Gas Control Technologies GHGT-16 23-27th October 2022, Lyon, France*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4286227.

Djankov, S. (2009). The Regulation of Entry: A Survey. *The World Bank Research Observer*, 24(2), 183–203. <http://www.jstor.org/stable/40649281>.

Djankov, S., La Porta, R., Florencio Lopez-de-Silanes, & Shleifer, A. (2002). The Regulation of Entry. *The Quarterly Journal of Economics*, 117(1), 1–37. <http://www.jstor.org/stable/2696481>.

El-Kady, A. H., Amin, M. T., Khan, F., El-Halwagi, M. M. (2024). Analysis of CO₂ pipeline regulations from a safety perspective for offshore carbon capture, utilization, and storage (CCUS). *Journal of Cleaner Production*, 439, 140734. <https://doi.org/10.1016/j.jclepro.2024.140734>.

Hu, J., Xinxin Pan, X., Huang, Q. (2020). Quantity or quality? The impacts of environmental regulation on firms' innovation—Quasi-natural experiment based on China's carbon emissions trading pilot. *Technological Forecasting and Social Change*, 158, 120122. <https://doi.org/10.1016/j.techfore.2020.120122>.

North, D. C. (1991). Institutions. *The Journal of Economic Perspectives*, 5, 97-112. <https://www.aeaweb.org/articles?id=10.1257/jep.5.1.97>.

Rai, V.; Victor, D. G.; Thurber, M. C. (2010). Carbon Capture and Storage at Scale: Lessons from the Growth of Analogous Energy Technologies. *Energy Policy*, 38, 4089-4098. <https://www.sciencedirect.com/science/article/abs/pii/S0301421510001989>.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Thiago Henrique Moreira Goes	Brazil	Federal University of Paraná State	thiagogoies@ufpr.br
Felipe Berkenbrock	Brazil	Federal University of Paraná State	felipe.berkenbrock@ufpr.br
Robert Marcelo Soster Culpí	Brazil	Federal University of Paraná State	culpirobert@ufpr.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Luciano Batista da Silva	Brazil	Federal University of Paraná State	lucianobatista@ufpr.br
Felipe Gobe Tonissi	Brazil	Federal University of Paraná State	felipetonissi@ufpr.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Governance in the application of resources in actions to combat deforestation in the Amazon Forest: Amazon Fund case study.

TYPE: a. original research

TRACK: 6. Government Policies and Governance for Impactful Innovations

PURPOSE: Deforestation and forest degradation emit greenhouse gases (GHG), especially carbon dioxide (CO₂), which alter the climate and generate other negative impacts on the environment and society (Ministry of the Environment, 2019). The Amazon Fund is a public fund created in 2007 as a pioneering REDD+ mechanism in Brazil, proposed at COP-13 (Corbera and Schroeder, 2010; Marcovitch and Pinsky, 2014), which operated for twelve years, until 2019, when its Guidance and Technical Committees were extinguished. The purpose of this study is to provide a comprehensive assessment of the governance of the Amazon Fund, based on the question of which characteristics of the Fund's governance would reduce its instability in the face of changes in government. Exactly like a company, the Amazon Fund needs to have strong governance that reflects its purpose because, to innovate, a company needs to perceive changes that may require adaptation (Oliveira Júnior et al, 2009). It is important to understand that REDD+ constitutes a mechanism that was created to generate the possibility of financially compensating developing countries for actions that voluntarily reduce deforestation in their tropical forests and thereby avoid GHG (greenhouse gas) emissions, that was created in the scope of the United Nations Framework Convention on Climate Change (UNFCCC) to encourage developing countries to conserve and recover their forests (Ministry of the Environment, 2019). In the theoretical foundation of this study, an approach was made to the literature on the subject, specifically, REDD+, Amazon Fund, National Council of the Legal Amazon and Governance Theory, all with a view to paying for results such as encouraging conservation, restoration, reforestation and sustainable development in the Amazon Forest.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

DESIGN/METHODOLOGY/APPROACH: This research was carried out based on the qualitative method, through a case study, the subject being the Amazon Fund itself, in which three propositions were developed to respond to the research problem (Yin, 2015), having as theoretical lens the Theory in Governance. Sixteen interviews were carried out with people linked to the Amazon Fund, subsequently analyzing their content and discussing the data collected through coding and categorization of the interviews, using the qualitative method of Content Analysis (Bardin, 2016), using ATLAS.ti 9 software as a tool, with presentation of results.

FINDINGS OR EXPECTED OUTCOMES: The results found determined the conclusion that the Amazon Fund was created based on a State Policy, however, its functioning depends on the ideologies and intentions of the existing government at a given moment, and may suffer interference, but if the diploma regulations of its creation are changed to be based on law, it will be able to remain intact in its management throughout governments. With the responses to the propositions, a theoretical framework was developed with recommendations for possible changes in the governance of the Amazon Fund and, from this, a theory called Steps of Environmental Public Governance was created, to guide this and other public funds, involving four steps or gradations: normative, management, representativeness and environmental, with the aim of strengthening the Fund.

ORIGINALITY/VALUE: The present study is original and socially relevant, above all, because society is the main recipient of the right to environmental preservation, and the fact that Brazil is the world's largest recipient of resources for Reducing Emissions from Deforestation and Degradation Forestry (REDD+), with the Amazon Fund having already received more than three billion Reais to invest in projects to combat and reduce deforestation in the Amazon.

PRACTICAL/SOCIAL IMPLICATIONS: This research fills a gap in the literature, adding clarity to academic and general knowledge about the Amazon Fund, where other researchers can benefit from its conclusions and suggestions for future lines of research. This study also contributes to the knowledge of political and professional agents about the FA's governance structure, its complex mechanisms, as well as the actions of various state and non-state actors in its creation and operation.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Future research should measure the effectiveness of projects supported by the Amazon Fund in reducing deforestation in the Legal Amazon during the period in which it was operating and monitoring the negotiations to reactivate the Amazon Fund. Inevitably, there were limitations in the study, such as the qualitative nature of the research itself, with content analysis, based on interviews, with no quantitative data being collected, nor exact statistical operations applied, being an eminently subjective analysis, in addition to the subjective understanding of each interviewee, with the influence of their idiosyncrasies and ideological positions.

KEYWORDS (3-5): Governance. REDD+. Deforestation. Amazon. Amazon Fund.

REFERENCES

ATLAS.ti 9. (2021). Qualitative data analyses. Cleverbridge. Supporting software.

Bardin, L. (2016). Content analysis. Translated by Luís Antero Reto. São Paulo: SP: Augusto Pinheiro.

Corbera, E., & Schroeder, H. (2010). Governing and implementing REDD+. *Environmental Science & Policy* 14(2), 89-99. Retrieved from <http://doi.org/10.1016/j.envsci.2010.11.02> Decree no. 6,527 (2008, August 1). Provides for the establishment of the Amazon Fund by the National Bank for Economic and Social Development (BNDES). Retrieved from http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2008/Decreto/D6527.htm

Amazon Fund. (2021). Report October 31, 2021. Retrieved from http://www.fundoamazonia.gov.br/export/sites/default/pt/.galleries/documentos/informe-de-carteira/2021_5bi_Informe-da-Carteira-Fundo-Amazonia.pdf

Marcovitch, J., & Pinsky, V. C. (2014). Amazon Fund: financing deforestation avoidance. *Revista de Administração*, 49(2), 280-90, Apr./May/Jun.

Ministry of the Environment. (2019). Redd+ Brazil. Amazon Fund. Recovered from <http://redd.mma.gov.br/pt/o-que-e-redd>.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Oliveira Junior, M., M., Boehe, D., M., & Borini, F., M. (2009). Strategy and innovation in multinational corporations (pp. 22, 26, 37). São Paulo: Saraiva.

UNFCCC. (2014). Decision booklet REDD+. Key decisions relevant for reducing emissions from deforestation and forest degradation in developing countries (REDD+). Retrieved from <https://unfccc.int/6917.php>.

Yin, R. K. (2015). Case Study: planning and methods. (C. M. Herrera, trans., 5th ed.). Porto Alegre: Bookman.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Naira Neila Batista de Oliveira Norte	Brazil	UEA (Amazonas State University)	nairanorte@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: The Role of Intellectual Property in Innovation Diplomacy

TYPE: (a. original research)

TRACK: Government Policies and Governance for Impactful Innovations

PURPOSE: This study examines the evolving role of intellectual property (IP) within the framework of innovation diplomacy, highlighting its significance as both a strategic asset and a catalyst in international relations and negotiations. By exploring the intricate relationship between IP rights and innovation diplomacy, this work aims to shed light on how IP influences and shapes the strategies of nations in the global arena, fostering economic growth, technological advancement, and international collaboration. Through analysis of real-world examples and international trade agreements, the study seeks to articulate the central role of IP in enhancing and defining the modern approaches to diplomacy and global innovation strategies.

DESIGN/METHODOLOGY/APPROACH: This study adopts a qualitative research design, leveraging a comprehensive literature review and analysis of critical case studies to explore the relationship between IP and innovation diplomacy. It examines international trade agreements and negotiations to understand IP's role in shaping global innovation strategies. Through this methodological approach, the research seeks to dissect the multifaceted dynamics of IP in international relations, highlighting its impact on diplomatic practices and policies across different nations and industries.

FINDINGS OR EXPECTED OUTCOMES: This study explains how IP is a pivotal element in innovation diplomacy, influencing international trade agreements and shaping global economic and technological policies. Our evidenced highlight IP's strategic role in fostering international collaboration, driving economic growth, and facilitating the exchange of knowledge and innovation across borders. We contribute to the discourse on integrating IP in diplomatic strategies, offering insights for policymakers,

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

diplomats, and innovation leaders on leveraging IP for enhanced international relations and cooperation.

ORIGINALITY/VALUE: This paper introduces a unique perspective on the interplay between IP and innovation diplomacy, highlighting IP's critical role beyond traditional legal and economic frameworks. It underscores IP's strategic importance in international relations, contributing to the emerging discourse on how nations leverage IP in diplomacy to achieve broader economic and technological goals. This research offers original insights into the mechanisms through which IP influences global innovation strategies, providing valuable implications for policymakers, diplomats, and innovation leaders seeking to navigate the complex landscape of international collaborations and negotiations.

PRACTICAL/SOCIAL IMPLICATIONS: This research elucidates the practical implications of integrating IP strategies within the realm of innovation diplomacy, emphasizing its potential to foster international collaboration, enhance economic development, and drive technological innovation. Socially, it underscores the role of IP in promoting equitable knowledge sharing and contributing to global problem-solving efforts. By demonstrating how IP can be a tool for diplomacy, the study offers insights for nations and international organizations to leverage IP in pursuing sustainable development and addressing global challenges.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This study paves the way for further exploration into the diverse applications of IP in innovation diplomacy across various geopolitical contexts and industrial sectors. Future research could investigate comparative analyses of IP strategies within different national innovation ecosystems, assessing their effectiveness in fostering international cooperation and economic development. A limitation of this study is its focus on selected case studies and trade agreements, which may not fully encompass the broad spectrum of IP's role in innovation diplomacy globally. Expanding the scope to include a wider array of examples could enrich the understanding of IP's multifaceted impact on global innovation strategies.

KEYWORDS (3-5): Innovation Diplomacy, Intellectual Property, Information Society, Science Diplomacy, International Negotiations

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

REFERENCES:

BOUND, KAREN. Innovating Together? The Age of Innovation Diplomacy. The Global Innovation Index 2016. Chap. 4, pp. 91-95, 2016.

LEIJTEN, JOS. Exploring the future of innovation diplomacy. European Journal of Futures Research, 5:20, 2017.

ARAÚJO-MOREIRA, FERNANDO M., SERRANO, NADJA F. G., MIGON, EDUARDO X. F. G. From Science and technology to innovation diplomacy: their future and the relationship with international security. Tempo do Mundo Magazine, n. 28, p. 30-42, 2022.

SILVA, RENAN G. L., FERREIRA, GABRIELA G. C., ONUKI, JANINA, OLIVEIRA, AMÂNCIO JORGE NUNES. The institutional building of science and innovation diplomacy in Latin America: toward a comprehensive analytical topology. Policy and Practice Reviews, 6, 654358, 2021.

CARON, FRANÇOIS. La dynamique de l'innovation. Technical change and social change. Paris: NRF, Gallimard, 2010.

GRISSET, PASCAL. The European Patent: A European Success Story for Innovation. Munich: European Patent Office, 2013.

SUNAMI, ATSUSHI, HAMACHI, TOMOKO AND KITABA, SHIGERU. The rise of science and technology diplomacy in Japan. Science and Diplomacy, 2, 1, 2013.

EUROPEAN COMMISSION. Europe's Future: Open innovation, Open science, Open to the world. Reflections of the Research, Innovation, and Science Policy Experts (RISE). Brussels, High Level Group, 2017.

MOFA. Advisory panel on science and technology diplomacy. Tokyo, 2015.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

REID, B. P. WILLIAMSON AND BOUND, K. Harnessing China's Commercialization Engine: Collaborating with China to Help UK Innovation Scale-up and Succeed in the Global Market. London, NESTA, 2015.

SÁ, C. AND LEE, H. Science, business, and innovation: Understanding networks in technology-based incubators. R&D Management, 42(3), 243–253, 2012. DOI: 10.1111/j.1467-9310.2012.00681.x

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Thiago Negrão Chuba	Japan	Kyoto University	negraochuba.thiago.d45@kyoto-u.jp
Kei Saito	Japan	Kyoto University	saito.kei.1y@kyoto-u.ac.jp
Daniel França Oliveira	Brazil	National Institute of Industrial Property (INPI)	dfranca@inpi.gov.br

XXII Triple Helix Conference – 2024

TITLE: PUBLIC RESOURCES FOR FINANCING INNOVATION: BRAZILIAN SCENARIO

TYPE: ORIGINAL RESEARCH

TRACK: Government Policies and Governance for Impactful

PURPOSE: In Brazil, the incentive to innovation has evolved substantially in the last two decades, especially since the 2000s. Among the instruments to support research and innovation activity in companies that today make up the national policy agenda, it has been observed that the Brazilian government In addition to granting credit with subsidized interest rates, it has provided direct subsidies to companies, tax incentives, venture capital contributions and the provision of non-refundable resources to research institutions to carry out joint projects with companies. Within this scenario, the present work has the general objective of analyzing the innovation financing scenario in Brazil and verifying the regional dynamics of financing practices for R&D activities with public resources.

DESIGN/METHODOLOGY/APPROACH: This quantitative study (GIL, 2008, p. 9) uses secondary data as a source of information. To collect the data, we used data available on the IBGE website, specifically on the Innovation Research link (PINTEC – 2012-2014 triennium). Taking into account the research objectives, information was collected based on: Companies included in sections B, C and D (Extractive Industries and Transformation Industries, Electricity and Gas) and in the services divisions to analyze the dynamics of financing innovation. To analyze the dynamics of Brazilian regions, data was collected from companies included in sections B and C (Extractive Industries and Processing Industries). The data collection dynamics followed the form of data availability carried out by IBGE, on the PINTEC icon. In addition to this, information was consulted on the Federal Government's investments in the Ministry of Science, Technology, Innovations and Communication - MCTIC.

To analyze the information, the Excel tool was used to process the information and construct graphs and tables

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

FINDINGS OR EXPECTED OUTCOMES: R&D spending by companies in Brazil reached 0.60% of GDP in 2014, compared to the year 2000 the percentage was around 0.51%. Although the increase (0.09%) in the period analyzed can be considered small, it is observed that there was an awakening in the business community towards innovation. In the PINTEC survey, from 2012 to 2014, in the stratification of Brazilian regions, it was possible to verify that of the universe of 117,976 companies, 42,987 (36.44%) implemented product and/or process innovations. Of these, only 5,914 companies (13.75%) spent on R&D activities.

Observing the regional innovation scenario, it is clear that the Southeast and South regions had the highest percentages of companies that carried out product and process innovation. In the Southeast region, the State of São Paulo stands out in relation to the others, while in the South region the States presented in the analysis have similar dynamics. In relation to the North, Northeast and Central-West regions, it was possible to observe that the Northeast region has the highest percentage of industries that implemented product and process innovation (12.37%). Among the states in this region, attention is drawn to Pernambuco and Ceará as they have similar percentages (29.09% and 21.07%, respectively).

When analyzing companies that spent money on R&D activities, the Northeast and Southeast regions present the highest percentages. Regarding the dynamics of the States located in these two regions, attention is drawn to the Northeast region as it presents low variation in the percentage rates of companies that spent on R&D. Diverging from this movement is the Southeast Region, where the states: Espírito Santo (2.91%) and Rio de Janeiro (7.48%) - have the lowest rate of companies that implemented innovation - while Minas Gerais (12.90%) and São Paulo (76.41%) show greater dynamism.

Brazilian companies adopted more financing for the purchase of machines and equipment used to innovate (74.83%), followed by the option of "other programs" to support innovation (20.27%) and also make use of tax incentives mainly to Research and Development (8.85%). Analyzing the scenario regarding the type of financing most adopted by region, it was possible to observe that the regions present particularities. In the Northern Region, entrepreneurs have a preference for adopting the resources arising from the IT Law (9.63%). As for the Northeast Region, the preference for the public purchasing modality (20.69%). The public purchasing modality was also the most used in the Central-West. Another point to note concerns the dynamics of Brazilian regions. The Southeast and South regions stand out as the companies that invest

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

the most in innovation. However, the internal dynamics of these regions are quite heterogeneous. That said, it is interesting to observe these characteristics in order to outline policies that meet the particularities, as well as promote changes in innovative practices so that the guidelines contained in regional policies aimed at financing innovation.

ORIGINALITY/VALUE: The availability of resources aimed at innovation and the need to understand Brazilian dynamics have been analyzed from different angles: Laplane (2024) it draws on a comparative analysis of two case studies of funding programs: the BNDES–FINEP Joint Program for Supporting Industrial Technological Innovation in the Sugar-based Economy and Sugar-Chemicals Sectors (PAISS), and the Ministry of Health's Production Development Partnerships Program (PDPP) and *Santana et al.* (2019) analyzed policies, tax incentives and sources of support for innovation in Brazil. This paper advances studies by analyzing the use of public resources to finance innovation by region.

PRACTICAL/SOCIAL IMPLICATIONS: The present study allows us to analyze public financing for innovation and informs about the participation of Brazilian regions in obtaining public resources.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: In this study, the quality of innovation generated in Brazilian regions was not considered. This is important for the Brazilian context and for evaluating policies as innovations in Brazil occur essentially through the incorporation of new machines and equipment and do not involve internal R&D efforts. In this aspect, it is also suggested to promote studies that allow observing the characteristics of Brazilian regions regarding the use of public resources aimed at innovation in order to outline policies that meet their particularities.

KEYWORDS (3-5): Region – Legislation - Innovation – R&D

REFERENCES

Laplane, A. (2024) Market co-creating and shaping through investments in innovation: a comparative analysis of two public funding programmes in Brazil, *Innovation and Development*, 14:1, 25-46, DOI: [10.1080/2157930X.2021.1989646](https://doi.org/10.1080/2157930X.2021.1989646)

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Santana, J. R., Teixeira, A. L. S. Rapini, M. S., Esperidião, F. (2019). Financiamento Público à Inovação no Brasil: Contribuição para uma Distribuição Regional mais Equilibrada?. Panejamento e Políticas Públicas. n. 52. Disponível em: https://repositorio.ipea.gov.br/bitstream/11058/9766/1/ppp_n52_financiamento.pdf

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Costa, Benedita Marta Gomes	Brazil	Universidade Estadual Vale do Acaraú-UVA	martagcosta578@gmail.com
Santos, Joana Stefanny Gomes Costa	Brazil	Universidade Federal do Ceará – UFC	joana12costa95@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

TITLE: Triple Helix – Subsystems Government and Academic: cistern's program in Brazilian semi-arid region

TYPE: practical case/experience analysis

TRACK: 4. Better Tomorrow: Engagement for Social and Environmental Impact / 6. Government Policies and Governance for Impactful Innovations

PURPOSE: Analyze, specifically the case of cistern's program in Brazilian semi-arid region, how the subsystem academic can contribute to the subsystem government in extent to legitimate a social impact and sustainable development.

METHODOLOGY: Content analysis of public documents from Government and the University responsible for the study of cistern's program results.

EXPECTED OUTCOMES: Semi-arid region in Brazil is known for you high temperatures the entire year, scarce and poorly distributed rainfall with a long period of drought. Therefore, technology to mitigate the effects of nature in that region is a necessary action, such as the cistern's program, a government water policy to help build structures to store water during the rainy season for families who live there, and expanding the access to drinking water (Government, 2023). The results of this program are measured by many institutes, including the academic field. Those measurements studies are important to legitimate and validate the water policy, and it is in this extent that the triple helix theory fits in the analysis. The government fostering the cistern's program and the academic field having the funds to study the social impact and sustainable development, are recognized as the interaction expected by triple helix (Etzkowitz, 2003; Carayannis & Campbell, 2010). In "*practical implication*" an academic article combined with government news will be explored to prove the interaction of triple helix's two subsystems.

ORIGINALITY/VALUE: Throughout the content analysis of documents related to a real case applied in Brazil, it is clear the necessity of government and academic fields interacting to have a social impact and a sustainable development of society. The value of this study is to apply the triple helix theory in a practical case, reaffirming its legitimacy and validity to academic studies. Also, it is possible to apply the theory by analyzing just one interaction of two subsystems, mainly because the third one will be implied because of that one interaction.

PRACTICAL/SOCIAL IMPLICATIONS: This study aims to analyze the subsystem of government and academia interacting in a real case – cistern's program in Brazilian semi-arid region. In 2023, an academic study showed how utero exposure to a large-scale climate adaptation program affects birth outcomes (Da Mata, Emanuel, Pereira e Sampaio, 2023). Da Mata *et al.* (2023) describe the program as a promotion of small-scale decentralized rainfall harvesting, and that the policies can foster positive long-run results in that region. Many studies show that the child mortality decreases, better food quality, life quality and employability arise (Government, 2023). It has a social impact and sustainable development that can be proven by how the subsystems

complete each other, by providing academic measurement studies to legitimize the public policies. There is no other better result to a water policy than that Da Mata *et al.* (2023) showed: “According to our baseline estimates, each additional week of exposure to cisterns is associated with a positive effect on birth weight of about 1.7 grams.” This article is not about the utero studies itself but is about how that study can strengthen the government’s action, and in this extent the triple helix is applied. Therefore, this interaction can prove how the academic field strengthens the government field, such as an example: if the government has a certainty of its actions, it will continually invest in that specific policy and may also have support of other important stakeholders to maintain the policy. In another example in this case, the child and mother safety can raise the employability index in a long-run period, affecting the private/enterprise subsystem of the triple helix.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: For further research the authors suggest analyzing the consequences that could happen in private/enterprise subsystem. Principal limitation in this article was time to search for more results and other academic studies that could also legitimize the social impact and sustainable development made by the water policy.

KEYWORDS (3-5): Subsystem government; subsystem academic; triple helix; social impact; sustainable development of society.

REFERENCES

Adner, R., & Kapoor, R. (2010). Value creation in innovation ecosystems: How the structure of technological interdependence affects firm performance in new technology generations. *Strategic management journal*, 31(3), 306-333.

Bardin, Laurence. *Análise de conteúdo*. Lisboa: Edições 70, 1977.

Barth, TD (2011b). *Freiheit, Gleichheit, Demokratiequalität: Zur Qualitätsmessung in den Top 20 Demokratien des Democracy Rankings [Freedom, Equality and the Quality of Democracy: Measuring Quality in the Top 20 Democracies of the Democracy Ranking]* Dissertation (Doctoral Thesis). Vienna: University of Vienna.

Carayannis, E. G., Barth, T. D., & Campbell, D. F. (2012). The Quintuple Helix innovation model: global warming as a challenge and driver for innovation. *Journal of innovation and entrepreneurship*, 1, 1-12.

Carayannis, E. G., & Campbell, D. F. (2010). Triple Helix, Quadruple Helix and Quintuple Helix and how do knowledge, innovation and the environment relate to each other?: a proposed framework for a trans-disciplinary analysis of sustainable development and social ecology. *International Journal of Social Ecology and Sustainable Development (IJSESD)*, 1(1), 41-69.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Da Mata, D., Emanuel, L., Pereira, V., & Sampaio, B. (2023). Climate adaptation policies and infant health: evidence from a water policy in Brazil. *Journal of Public Economics*, 220, 104835.

Etzkowitz, H. (2003). Innovation in innovation: The triple helix of university-industry-government relations. *Social science information*, 42(3), 293-337.

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university-industry-government relations. *Research policy*, 29(2), 109-123.

Governo do Brasil. (2023). Com investimento de R\$562 milhões, Governo Federal retoma Programa Cisternas. Acessado em 27 mar. 2023, em: <<https://www.gov.br/pt-br/noticias/assistencia-social/2023/07/com-investimento-de-r-562-milhoes-governo-federal-retoma-programa-cisternas>>.

Governo do Brasil. (2023). Pesquisa da FGV aponta que Programa Cisternas melhora saúde dos bebês no Semiárido brasileiro. Acessado em 27 mar. 2023, em: <<https://www.gov.br/pt-br/noticias/assistencia-social/2023/08/pesquisa-da-fgv-aponta-que-programa-cisternas-melhora-saude-dos-bebes-no-semiarido-brasileiro>>.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Rachel Nogueira Calcagno Horta	Brazil	Universidade Presbiteriana Mackenzie	rachelnchorta@gmail.com
Fellipe Silva Martins	Brazil	Universidade Presbiteriana Mackenzie	fellipe.martins@mackenzie.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Zhongguancun Science Park como Estratégia governamental de Impacto para o Ecossistema da Inovação

TYPE: b. research Design

TRACK: 6. Políticas Governamentais e Governança para Inovações Impactantes

PURPOSE: O estudo tem como objetivo investigar o modelo de parque tecnológico líder em inovação implantado na China, o Zhongguancun Science Park, a fim de propor modelos eficazes para a formulação de políticas governamentais (HOBBS; LINK; SCOTT, 2016). Os parques científicos e tecnológicos (PCTs) têm se destacado como estratégias eficientes para solucionar os problemas de interação dos setores da cadeia produtiva, os quais dificultam a execução das práticas inovadoras em dadas economias regionais (ANPROTEC, 2019). O complexo ecossistema da inovação une universidades, empresas de gestão, indústrias, investidores, comércio, meios de comunicação, governo e a sociedade como um todo. Políticas governamentais assumem papel fundamental para a constituição e fomento destes centros, com a definição de metas e a organização da economia local, regional, nacional e internacional (CHEN; LINK, 2018).

O governo chinês, a partir da década de 1980, com uma série reformas políticas e econômicas, estabeleceu esforços para estimular a modernização e industrialização do país ao promover setores-chaves de alta tecnologia no “Torch Program” em 1988, data de fundação do Zhongguancun Science Park (JONGWANICH; KOHPAIBOON; YANG, 2014). O “Made in China 2025”, lançado em 2015, foca em tecnologia da informação, biotecnologia, inteligência artificial, semicondutores, energia limpa e telecomunicações. Estas estratégias podem ser elencadas como um referencial para formuladores de políticas (IASP, 2019).

DESIGN/METHODOLOGY/APPROACH: O estudo se estrutura a partir de uma análise local da China, porém multissetorial e multirregional, na intersecção do fluxo de trocas comerciais nos diferentes âmbitos,

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

local ao internacional, bem como, de cooperação de diferentes conjunturas culturais, sociais e econômicas. Combina elementos quantitativos e qualitativos, ao analisar a literatura sobre o tema e os indicadores econômicos, sociais e de inovação, como produção científica e tecnológica disruptivas, geração de empregos e crescimento econômico sustentável na situação específica do Zhongguancun Science Park. Para capturar o desenvolvimento do ecossistema da inovação a abordagem se realiza de maneira interdisciplinar, através da ciência da inovação sustentável, da economia regional, da gestão de tecnologia e das políticas públicas. Há a necessidade de olhar para fatores conjecturais e regionais que influenciam a eficácia.

FINDINGS OR EXPECTED OUTCOMES: Espera-se a ponderação sobre modelos eficazes, a definição das principais características e instrumentos governamentais utilizados no Zhongguancun Science Park. As formas de planejamento, estrutura, suporte à pesquisa e desenvolvimento (P&D), proteção à propriedade intelectual, incentivos fiscais, apoio financeiro e mentorias para os investimentos em capital de risco, estimulando competitividade e a ética social. Além disso, ser possível avaliar o impacto econômico sustentável, analisar a dinâmica do ecossistema de inovação, identificar as melhores práticas e desafios e as implicações para as políticas públicas.

ORIGINALITY/VALUE: Consiste em sistematizar instrumentos para modelos de políticas governamentais, a fim de promover ecossistemas de inovação sustentáveis e eficazes em conjunturas regionais e multissetorial, com abordagem mista e de impacto socioambiental.

PRACTICAL/SOCIAL IMPLICATIONS: Impactar a sociedade com o desenvolvimento de políticas públicas de grande porte na formação de incubadoras e parques tecnológicos. Potencializar o empreendedorismo e a inovação, o desenvolvimento regional sustentável, o fortalecimento da colaboração acadêmico e industrial, tal como a cooperação internacional.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Investigações futuras podem aprofundar problemas na interação e execução de cada setor em específico do ecossistema de inovação e melhorar as práticas governamentais. Definir as dificuldades regionais que impendem boas práticas na

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

implementação de redes de inovação.

KEYWORDS (3-5): Technology Parks; Innovation Ecosystem; Government Strategy

REFERENCES

ANPROTEC. Parques Tecnológicos Consolidados. 2019. Disponível em: <<http://anprotec.org.br/site/lideres-tematicos/parques-consolidados>>. Acesso em: 05 jan. 2024.

CHEN, Chuchu; LINK, Albert N. Employment in China's hi-tech zones. *International Entrepreneurship and Management Journal*, p. 697-703, 2018. <http://dx.doi.org/10.1007/s11365-017-0486-z>

HOBBS, Kelsi G.; LINK, Albert N.; SCOTT, John T. Science and technology parks: an annotated and analytical literature review. *The Journal of Technology Transfer*, p. 957-976, 2017. <https://doi.org/10.1007/s10961-016-9522-3>

IASP. Definitions. Disponível em: IASP. Definitions. Disponível em: <<https://www.iasp.ws/our-industry/definitions>>. Acesso em: 05 jan. 2024.

JONGWANICH, Juthathip; KOHPAIBOON, Archanun; YANG, Chih-hai. Science park, triple helix, and regional innovative capacity: province-level evidence from China. *Journal of the Asia Pacific Economy*. S.I., p. 333-352, 2014. <https://doi.org/10.1080/13547860.2014.880285>

YANG, Chih-hai; LEE, Chia-min; LIN, Chun-hung A. Why does regional innovative capability vary so substantially in China? The role of regional innovation systems. *Asian Journal of Technology Innovation*, p. 239-255, 2012.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Eliziane Gava	Brazil	University of São Paulo (USP)	gava.eliziane@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE:

“Brazilian Universities as contractors in Public Procurement for innovation: opportunities and challenges”

TYPE (a. original research, b. research Design or c. practical case / experience analysis)

a. original research

TRACK:

6. Government Policies and Governance for Impactful Innovations

PURPOSE:

This study aims to analyze contractual aspects in Pre-Commercial Procurement (PCP), a type of Public Procurement for innovation - PPI (RAUEN, 2023B) carried out in the Brazilian scenario following the enactment of the Legal Framework for Science, Technology, and Innovation (ST&I Legal Framework). Considering that in the Brazilian National Innovation System public universities concentrate science and technological activities, with less participation of companies (CALIARI, RAPINI e CHIARINI, 2020; CREPALDE, 2020), the interaction between universities and firms in a “combination of competencies model” for PCP can be fundamental for increasing its use in Brazil (DOMINGUES, 2021). The universities’ entrepreneurial role in their third mission of participating in economic development (ETZKOWITZ and LEYDESDORFF, 2000) is a fundamental point of this model. PCP is an important tool for leveraging state purchasing power and conveying public missions (EDLER e GEORGHIOU, 2007), and universities-firms partnerships for supplying technological solutions can be strategic. Thus, PPI can foster university-firm cooperation as a spill-over, characterizing an initiative within Triple Helix.

DESIGN/METHODOLOGY/APPROACH:

The database used in this study was a list of PCP compiled by the Institute of Applied Economic Research (IPEA), which presents a mapping of Brazilian federal PCP, from 2010 to 2022 (RAUEN, 2023A). Based on data provided by IPEA, additional information regarding contractors' legal personality and nationality was collected. Subsequently, a profile of PCP in the Brazilian scenario was outlined, focusing on Law No. 13,243/2016 publication date, which inaugurated the Brazilian ST&I Legal Framework. In this regard, the following parameters were used: (i) distribution of PCP over the years; (ii) legal personality of the contractor; (iii) nationality of the contractor; (iv) PCP monetary values. Next, data were grouped according to parameters in charts. Afterwards, the data was analyzed, and the observed conclusions were discussed, with a special focus on the participation of universities as contractors in PCP.

FINDINGS OR EXPECTED OUTCOMES:

After analyzing 37 Brazilian PCP cases carried out after the ST&I Legal Framework since 2016, it was possible to observe that: (i) there are still few PCP in Brazil; (ii) the majority of the contracts are of low value; (iii) the majority of contractors are national; (iv) the majority of contractors are companies, with universities being poorly represented. Based on these results, it was discussed that the low participation of public universities in PCP seems to be contradictory given the prominence of these institutions in science, technology, and innovation activities in Brazil. Therefore, the findings highlight the importance of public universities' participation in PCP being part of the agenda of Brazilian innovation policies for there to be full effectiveness of PCP in Brazil.

ORIGINALITY/VALUE:

Brazilian companies have low capacity for innovation and technology development, while universities have scientific and technological capacity, but face difficulties in bringing these to the market. The guaranteed public demand reduces uncertainties related to commercialization, especially for innovations

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

that are disruptive, as in PPI the state can act as a lead user (EDLER e GEORGHIOU, 2007).

The main contribution of this article is to highlight the importance of partnerships between universities and firms as contractors for PCP in order to foster innovation, since in addition to funding, it guarantees a market for the technology, which is strategic given that Brazil's research infrastructure and knowledge are concentrated in universities. Also, literature lacks debate of the role of universities in PPI. The importance of universities as contractors for PCP that do not involve production or commercialization is mentioned (RAUEN, 2023B). However, the present work focuses not only on the importance of universities in PPI but also on partnerships between universities and companies being fundamental to PCP in Brazil.

PRACTICAL/SOCIAL IMPLICATIONS:

In Brazil, PPI still lacks greater utilization, and PCP is no different. To increase the adoption of demand-side policy instruments in the Brazilian scenario, as shown, it is important to include universities and other research institutes in the agenda to generate sophisticated products and technologies.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Further research can investigate more deeply how universities can contribute as contractors in PCP and other PPI instruments, as well as how partnerships between universities and firms can influence PPI. A limitation of this work is the small sample size of analysis given the few PCP in the Brazilian context.

KEYWORDS (3-5)

Innovation policy - Public Procurement for innovation - Entrepreneurial University- Brazil

REFERENCES

Caliari, T., Rapini, M.S. & Chiarini, T. (2020). Research infrastructures in less developed countries: the Brazilian case. *Scientometrics* 122, 451–475. <https://doi.org/10.1007/s11192-019-03245-2>

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Crepalde, J. (2020). New arrangement for innovation in Scientific, Technological and Innovation Institutions (ICT): Innovation Catalyst Thematic Environment (ICTE) and the experience of UFMG. Thesis (Doctorate in Innovation) - Federal University of Minas Gerais.

<https://repositorio.ufmg.br/handle/1843/36100>.

Domingues, N. (2020). The innovation policies of scientific, technological, and innovation institutions (ICT) in the context of technological orders. Dissertation (Master in Technological Innovation and Intellectual Property). Federal University of Minas Gerais. <https://repositorio.ufmg.br/handle/1843/39289>.

Edler, J., & Georghiou, L. (2007). Public procurement and innovation-Resurrecting the demand side. *Research Policy*, 36(7), 949–963. <https://doi.org/10.1016/j.respol.2007.03.003>.

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From National Systems and “mode 2” to a Triple Helix of university-industry-government relations. *Research Policy*, 29(2), 109–123. [https://doi.org/10.1016/S0048-7333\(99\)00055-4](https://doi.org/10.1016/S0048-7333(99)00055-4).

Rauen, A. T. Mapeamento das encomendas tecnológicas no período 2019-2022. Brasília: IPEA, 2023.

Rauen, A. T. Strengthening Brazil’s innovation policy through public procurement. Brasília: IPEA, 2023.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Nathália Domingues	Brasil	UFMG	n.dominguesb@gmail.com
Márcia Rapini	Brasil	UFMG	msrapini@cedeplar.ufmg.br
Juliana Crepalde	Brasil	UFMG	jucrepalde@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

TITLE: Innovation ecosystems and their role in fostering entrepreneurship: A study on the role of the Empresa Nacional de Parques de Ciência e Tecnologia de Maluana (Maluana National Company of Science and Technology Parks in Mozambique)

TYPE: Practical Case

TRACK: Government Policies and Governance for Impactful Innovations

PURPOSE: Emerging entrepreneurs face several challenges, ranging from a lack of funding for R&D, inexperienced human capital, and cumbersome labor and tax laws, which limits the ability to develop competitive products as well as market penetration (Sun *et al.*, 2018), making it difficult for start-ups in isolation to add innovations needed for successful entrepreneurship (Mei *et al.*, 2014).

However, this is not a reality for all countries, as particularly developed economies recognize the importance of creating favorable environments to support overcoming the weaknesses that emerging companies face and stimulate innovation and entrepreneurship. Many policymakers recognize the need to promote entrepreneurship support ecosystems as strategies to overcome the difficulties that emerging companies face. However, some developing countries, through public policies, create institutions or other models of organizations to stimulate innovation and entrepreneurship. **So, do these institutions created by governments play the role for which innovation ecosystems are created?**

The objective of the research is to understand the role that the National Company of Science and Technology Parks of Maluana plays as an ecosystem model for fostering and encouraging innovation and entrepreneurship in Mozambique.

DESIGN/METHODOLOGY/APPROACH: The research was carried out at the National Company of Science and Technology Parks of Maluana (ENPCTM). Framed in the qualitative approach, the single case study strategy was used, integrating multiple units of analysis that are the incubators and incubated companies. The interview was the data collection technique used and was addressed to the managers of the ENPCTM on behalf of the Government, to the managers of the incubators, e managers of incubated companies. Through content analysis, the description of the actors that act in the ecosystem was made; the identification of actions to promote entrepreneurship; and understanding of how cooperation between the actors of the ecosystem stimulates entrepreneurial initiatives.

FINDINGS OR EXPECTED OUTCOMES: The Maluana Science and Technology National Park Company is a public entity, created in 2012 as a model of Science and Technology Park with a view to concentrating, connecting, organizing, articulating, implementing, and promoting innovative enterprises. It integrates various actors from incubators, start-ups (incubated companies), universities and other governmental and

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

non-governmental entities, and is oriented to fostering innovation and entrepreneurship in Mozambique through collaboration.

The actions of the ecosystem are anchored in the interactions between the individuals that make up the various organizations, and are underpinned by the vision of sharing resources, knowledge and experiences between the actors that make up the incubators and the actors of the incubated companies, which catalyzes innovation and the rapid growth of emerging companies. The ecosystem supports start-ups, entrepreneurs, and other actors in the development of innovative technologies, financing, exhibition at national and international fairs, licensing, and training.

Incubation is the main action to foster innovation and entrepreneurship in the ecosystem, in a dynamic process oriented towards the development of new companies through support that accelerates the growth of emerging companies, through the provision of various resources, opportunities to participate in technology fairs, seminars and other specific services needed by start-ups. Start-up incubation is the mechanism by which the ecosystem drives innovation and entrepreneurship through the support that the most experienced actors (incubators) give to start-ups.

The incubators offer mentoring, exchange of experiences, which allow start-ups to understand the market in advance, based on needs, competition, and guiding policies.

Cooperation in the innovation ecosystem stimulates innovation and entrepreneurship as it is underpinned by collaborative agreements, whereby companies combine their individual offerings into a coherent customer-facing solution, as suggested Granstrand and Holgersson (2020).

The results demonstrate a direct relationship between incubation and entrepreneurial action, as he argues Bosma *et al*, (2018), that incubators are created with the purpose of stimulating the creation of new businesses and accompanying emerging companies to the maturity stage.

ORIGINALITY/VALUE: After the implementation of the initiative to create the National Company of Science and Technology Parks of Maluana in Mozambique, no scientific research has been conducted that analyzes the effectiveness of this public policy in promoting innovation and entrepreneurship in the country.

PRACTICAL/SOCIAL IMPLICATIONS: To achieve the objective of the research, it is possible to understand the role that the ENPCTM it plays a role in encouraging innovative and entrepreneurial practices and may awaken public policy makers to the need to expand science and technology parks to other regions of Mozambique, contributing to the emergence and survival of emerging innovators and entrepreneurs.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: It is suggested that more research be conducted to understand the impact that incubated start-ups have on

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

society, to encourage the orientation of resources in the implementation of more innovation ecosystems in the country. Comparative research between government policy of innovation ecosystems and other private innovation-oriented strategies through cooperation that exist in the country is recommended.

KEYWORDS (3-5): Innovation ecosystem. Incubation. Cooperation.

REFERENCES:

1. Bacon, E., Williams, M. D., Davies, G. (2020). Coopetition in innovation ecosystems: A comparative analysis of knowledge transfer configurations. *Journal of Business Research*, 115, p.307-316.
2. Bosma, N., Content, J., Sanders, M., Stam, E. (2018). Institutions, entrepreneurship, and economic growth in Europe. *Small Business Economics*, 51, p.483-499.
3. Granstrand, O., Holgersson, M. (2020). Innovation ecosystems: A conceptual review and a new definition. *Technovation*, p. 90-91.
4. Mei, L., Chen, J., Liu, Y. (2014). Innovation ecosystem: Origin, knowledge evolution and theoretical framework. *Studies in Science of Science*, 32(12), p.1771-1780.
5. Sun, S. L., Chen, V. Z., Sunny, S. A., Chen, J. (2018). Venture capital as an innovation ecosystem engineer in an emerging market. *International Business Review*.

CONTACTS Nome	País	Organização	Email
Adriano Carlos Chihanhe	Moçambique	USP	adriano.chihanhe@usp.br adrianocarloschihanhe@gmail.com
Sueina da Arlete Alcindo Neve	Moçambique	UEM	sueimaalcindoneves@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: INNOVATION IN PUBLIC CONTRACTS: AN ANALYSIS OF IMPLEMENTATION IN BRAZILIAN STATES

TYPE: Original research

TRACK: 6. Government Policies and Governance for Impactful Innovations

PURPOSE:

The purpose of this research was to explore the deployment of specialized Public Procurement of Innovation (PPI) modalities by Brazilian state governments. At its core, the study aimed to decipher the strategies and methodologies employed by these states to encourage and foster innovation via public procurement. This endeavor sought to uncover efficacious practices and delineate the obstacles encountered throughout this innovative procurement process.

DESIGN/METHODOLOGY/APPROACH:

The research design adopted is observational and cross-sectional, with data collection covering 2019 to 2022. This period was chosen for its comprehensiveness, contextual stability, data availability, and focus on evaluating recent changes. The analysis covered all Brazilian states and the Federal District as units of analysis, covering a total of 27 cases.

The methodology involved a multi-stage data collection process. Initially, an analysis of the legal landscape of PPI in the states was carried out, including the identification of state regulations related to innovation and PPI incentives. Next, a mapping of the PPI instruments used by the states between 2019 and 2022 was carried out, with a special focus on two distinct contracting modalities: "Encomenda Tecnológica" (ETEC) and "Contrato Público para Solução Inovadora" (CPSI). These modalities represent

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

different strategies within innovation procurement, and the research specifically targeted contracts signed within the defined period for detailed analysis.

Subsequently, the study sought to identify the factors that facilitate or inhibit PPI, from the perspective of Science, Technology, and Innovation (ST&I) managers. This was done through semi-structured interviews with six ST&I secretaries, representing a diverse geographical distribution in Brazil: one from the South, two from the Southeast, one from the Midwest, and two from the Northeast. Despite the invitations extended to all state secretaries, the actual sample reflected 22% of the population, attributed to various factors, including unavailability or non-response.

The final stage of the research involved a process of data analysis, employing content analysis and deductive coding techniques. This approach allowed for a systematic categorization of the factors identified, ensuring a comprehensive understanding of the facilitators and barriers to PPI implementation in Brazilian states.

FINDINGS OR EXPECTED OUTCOMES:

This study elucidates the implementation of PPI by state governments in Brazil, highlighting a landscape where state regulations largely lack specificity and are outdated. It observes nascent efforts towards the effective enactment of the "Encomenda Tecnológica" (ETEC) and "Contrato Público para Solução Inovadora" (CPSI). Notably, these efforts predominantly aim at enhancing internal organizational processes rather than addressing broader societal needs. This scenario is intricately linked to key factors that either facilitate or impede the adoption of public innovation contracts, including the novelty of the concept, a heightened perception of risks associated with innovation, and the prevalent bureaucratic hurdles within the public sector.

PPI holds the promise to transcend the constraints of conventional procurement models, which are often inadequate in meeting the intricate and evolving requirements of public administration and societal welfare. Nonetheless, this study concludes that for Brazilian states to actualize this potential, a concerted effort is necessary to bolster the technical expertise of managers and public servants. Furthermore,

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

fostering an organizational culture inclined toward innovation and cultivating a greater openness to risk-taking are imperative steps toward realizing the transformative power of PPI.

ORIGINALITY/VALUE:

The originality of this study lies in its detailed and systematic approach to understanding the implementation of Public Procurement of Innovation in Brazilian states, a topic that has been little explored in the existing literature. By combining documentary analysis with semi-structured interviews of ST&I managers, the study provides valuable insights into the challenges and facilitators of adopting innovation policies in the public sector, contributing a new perspective to research and practice in innovation policies.

PRACTICAL/SOCIAL IMPLICATIONS:

The practical and social implications of this study highlight the importance of advancing the understanding and implementation of innovation contracts in the public sector. It emphasizes the need to develop effective strategies that use the available contractual instruments in innovation policy, not only expanding knowledge on the topic but also providing guidelines for the practical adoption of these innovations. This could lead to a significant improvement in the efficiency and effectiveness of public services, in addition to stimulating economic and social development through innovation.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Considering the nascent stage of PPI implementation in Brazil, as revealed by this study, there exists significant scope for future research to further dissect these practices and assess their impacts. This early phase of implementation presents a fertile ground for enhancing PPI mechanisms within the Brazilian framework, positioning it as an auspicious domain for forthcoming scholarly exploration.

KEYWORDS (3-5): innovation; innovation policy; public procurement; public procurement of innovation.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

REFERENCES:

EDLER, J.; GEORGHIOU, L. Public procurement and innovation: resurrecting the demand side. *Research Policy*, v.36, n.7, p.949-963, 2007.

EDQUIST, C.; ZABALA-ITURRIAGAGOITIA, J. M. Public Procurement for Innovation as Mission-Oriented Innovation Policy. *Research Policy*, v.41, n.10, p.1757-1769, 2012.

ISIDRO-FILHO, A. Inovação no Setor Público: evidências da gestão pública federal brasileira no período 1994-2014. Brasília: CONSAD, 2017.

MENDONÇA, H.; PORTELA, B. M.; NETO, A. Contrato público de soluções inovadoras: racionalidade fundamental e posicionamento no mix de políticas de inovação que atuam pelo lado da demanda. In: RAUEN, A. T. *Compras Públicas para Inovação no Brasil Novas Possibilidades Legais*. Brasília: IPEA, 2022.

RAUEN, A. T. *Compras Públicas para Inovação no Brasil: novas possibilidades legais*. Brasília: IPEA, 2022.

YEONGJUN, Y.; LEE, J.; KIYOON, S. Revitalizing the Concept of Public Procurement for Innovation (PPI) from a Systemic Perspective: Objectives, Policy Types, and Impact Mechanisms. *Springer Science*, v.33, n.2, p. 187-211, 2019.

CONTACT INFO:

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Izabel Sabino de Sousa	Brazil	Arizona State University	izabelsabino@asu.edu
James Batista Vieira	Brazil	Federal University of	james@ccsa.ufpb.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

		Paraiba	
--	--	---------	--

XXII Triple Helix Conference – 2024

TITLE: Innovation Policies as Promoters of Sustainability through the Quintuple Helix: A Case Study in a Higher Education Institution (HEI) in Brazil

TYPE: c. Practical case /experience analysis

TRACK: 6. Government Policies and Governance for Impactful Innovations

PURPOSE: There is a growing consensus on the urgent need to make the sustainable green economy and decouple economic growth from environmental pressure. In this context, national and international policies that support the search for sustainable solutions are emerging quickly and are inserted in different contexts. The present study aims to identify how the Quintuple Helix can be driven by innovation policies within an HEI through sustainability actions. To this end, we have the following specific objectives: (i) Identify the representation of the Quintuple Helix present in innovation policies; (ii) Identify the benefits and potential of sustainability actions for society; (iii) Verify the main challenges of sustainability actions.

DESIGN/METHODOLOGY/APPROACH: The research had a qualitative approach, using the Case Study method. Remote interviews were carried out with managers involved in the innovation policies of an HEI, and the data was subsequently analyzed using thematic and frequency content analysis. Innovation policies involved 4 different HEI programs, such as: incubators, technological innovation centers, industrial innovation hubs and junior companies.

FINDINGS OR EXPECTED OUTCOMES: The Quintuple Helix highlights the role of the natural environment in society and economy by promoting advances in the processes of knowledge production and innovation. HEI innovation policies play an important role in disseminating the Quintuple Helix through sustainability actions, such as Solar Program; River Program; Citizen selective collection; Collection of

electronic waste, collection of pesticide packaging, among others. These actions promote the economic, social and environmental development of the region, covering aspects such as education, entrepreneurship and partnerships. Benefits include recognition, dissemination of knowledge, economic benefits, appropriate waste disposal and engagement of students and teachers. However, there are challenges that require cultural change, investment in structure and greater involvement of society. In order to overcome them, interaction with society is crucial, as the dissemination and recognition of the HEI's actions.

ORIGINALITY/VALUE: The research contributed to understanding the role of the university as a driver and promoter of the Quintuple Helix, systematizing its sustainability actions, and highlighting a representative model of the context, in which the university helix positions itself as a promoter of sustainable practices for the other helices.

PRACTICAL/SOCIAL IMPLICATIONS: The study brings practical contributions to managers, in order to condense the sustainability actions included in projects associated with Innovation Policies. It's expected that such results can support the formulation of public policies and business practices that aim at the region sustainable development and the country as a whole.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: For future research, it's suggested to carry out case studies in other educational institutions with similar innovation and sustainability policies, in order to compare and contrast the results. Furthermore, it is important to consider the perspective of the different actors involved in Innovation Policies. It is worth noting possible limitations, such as the non-generalization of the results to other institutions or the subjectivity of the interviewees' responses.

KEYWORDS (3-5): Innovation Policies, Sustainability, Quintuple Helix, Sustainable Development.

REFERENCES

Barbieri, J. C. (2020). *Desenvolvimento sustentável: das origens à Agenda 2030*. Editora Vozes.

- Binsawad, M.; Sohaib, O. & Hawryszkiewicz, I. (2019). Factors impacting technology business incubator performance. *International Journal of Innovation Management*, Oxford, 23 (1), 1-30.
- Brito, M. D.; Brunstein, J. & Amaro, R. A. (2018). Education for sustainability beyond the classroom: Companies born in university incubators. *Iberoamerican Journal of Entrepreneurship and Small Business*, 7 (2), 1-30.
- Carayannis, E. G.; Barth, T. D. & Campbell, D. F. (2012). The Quintuple Helix innovation model: global warming as a challenge and driver for innovation. *Journal of Innovation and Entrepreneurship*, 1 (1), p. 2.
- Carayannis, E. G. & Campbell, D. F. (2011) Open Innovation Diplomacy and a 21st Century Fractal Research, Education and Innovation (FREIE) Ecosystem: Building on the Quadruple and Quintuple Helix Innovation Concepts and the “Mode 3” Knowledge Production System. *Journal of Knowledge Economy*, 2 (1), 327-372.
- Chen, H.; Chien, L. & Hsieh, T. (2013) A study of assessment indicators for environmental sustainable development of science parks in Taiwan. *Environmental Monitoring and Assessment*, 8 (1), 7001-7012.
- Etzkowitz, H. & Leydesdorff, L. (2000) The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university-industry-government relations. *Research Policy*, 29 (2), 109-123.
- Klofsten, M. *et al.* (2020) Incubator specialization and size: Divergent paths towards operational scale. *Technological Forecasting and Social Change*, 151 (1), 119821.
- Laraichi, S. & Hammani, A. (2018). How can information and communication effects on small farmers’ engagement in groundwater management: Case of SAISS Aquifers, Morocco. *Groundwater for Sustainable Development*, 7 (1), 109–120.
- Lobosco, A.; Macari, E. A.; Costa, P. R. D. & Almeida, M. I. R. D. (2019). Proposed business model for the sustainability of technology business incubators in Brazil and Portugal. *International Journal of Entrepreneurship and Innovation Management*, 23 (2), 97-141.
- Mostafa, N. & Negm, A. (2018). Promoting organizational sustainability and innovation: An exploratory case study from the Egyptian chemical industry. *Procedia Manufacturing*, 22 (1), 1007-1014.
- ONU – Organização das Nações Unidas (2022). *Objetivos para transformar nosso mundo – Agenda 2030*. Available in: <https://brasil.un.org/pt-br/sdgs..>
- Theodoraki, C.; Messeghem, K. & Rice, M. (2018). A social capital approach to the development of sustainable entrepreneurial ecosystems: an explorative study. *Small Business Economics*, 51 (1), 153-170.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Regiane Cristina Magalhães	Brasil	Federal University of Itajubá (UNIFEI)	regiane.c.magalhaes@gmail.com
Andréa Aparecida da Costa Mineiro	Brasil	Federal University of Itajubá (UNIFEI)	andreamineiro@unifei.edu.br
Sandra Miranda Neves	Brasil	Federal University of Itajubá (UNIFEI)	sandraneves@unifei.edu.br
Isabel Cristina da Silva Arantes	Brazil	Federal University of Itajubá (UNIFEI)	isabel.adm@unifei.edu.br
Eliana de Fátima Salomon Souza	Brazil	Federal University of Itajubá (UNIFEI)	efssalomon@unifei.edu.br

07

Entrepreneurship and Startups in Impact Innovation

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: In search of a framework for Deep Tech's Entrepreneur Change - a case study.

TYPE: a. original research

TRACK: 7. Entrepreneurship and Startups in Impact Innovation

PURPOSE: This study aims to understand how the entrepreneurial change process occurs, its phases, and cumulative transitions, within the Deep Tech ecosystem.

DESIGN/METHODOLOGY/APPROACH: This qualitative research uses a case study to deepen the studied phenomenon. Our analysis unit is the Deep Tech entrepreneur, an individual who, due to extreme uncertainty, decides to undertake a startup. Hence, we use the Theory of Organizational Change model as a lens to solidify our research. More specifically, we decided to take a niche look at a specific company in the HealthTech sector, due to the uniqueness of its scientific discovery in the health area. Professionals at various levels will be interviewed, including senior management, researchers, and technical and administrative staff to broaden the discussion and aid in constructing a framework for Health tech companies.

FINDINGS OR EXPECTED OUTCOMES: As this is a frontier of knowledge topic, by describing the case study we hope to understand the Deep Tech entrepreneur's journey of change from the development of the long-term vision, through scientific discovery - in the knowledge ecosystem - to the establishment and development of the startup - in the entrepreneurial ecosystem. In the light of established organizational change models (Kotter 2013, 2015 and Santos et al., 2023) we intend to develop a framework of the Deep Tech entrepreneur change for companies accessing the same barriers, obstacles, and bottlenecks in this process so they can turn around and understand the main facilitating initiatives,

ORIGINALITY/VALUE: The results of this study suggest a process of change for the Deep Tech

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

entrepreneur to develop and implement its value proposition, and yet to deal with the barriers inherent in the phases and transitions of the knowledge, entrepreneurial, and innovation ecosystems. Thus, a framework of change is proposed to guide Deep Tech entrepreneurs on their journey of change from scientific discovery, through governance and the development of business plans. In effect, this study hopes to shed light and suggest valuable change initiatives to maximize the strategic vision of a Deep Tech startup founder.

PRACTICAL/SOCIAL IMPLICATIONS: Deep Tech startups aim to drive solutions by creating and systematically integrating scientific knowledge through partnerships between universities, companies, and the government. In this sense, creating mechanisms that enhance the entrepreneur's journey can create downstream offerings with the potential to tackle major social challenges, generate employment and income, improve health and well-being, and even strengthen partnerships and means of implementation.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This study allows us to understand how it becomes possible for Deep Tech entrepreneurs to move from a knowledge ecosystem to an entrepreneurial ecosystem and eventually structure themselves to reach the innovation ecosystem. However, our study has its limitations, one of which concerns the research being at an initial stage, understanding the constructs that form our proposed model. In a more advanced phase, we will begin collecting primary data to more deeply analyze the data that will inductively come from the field, allowing us to design the proposed model. Another limitation is the exploratory nature, which does not allow us to generalize. Finally, we see directions for future studies, like combining the framework of Deep Techs from different sectors, sizes, and complexity, which can provide nuances to the research findings.

KEYWORDS (3-5): Health Tech; Deep Tech; Entrepreneur; Organizational Change; Framework.

REFERENCES

Bardin, L. (2011). *Análise de conteúdo*, Edições 70, São Paulo.

Basilio, O., Murray, F., & Frolund, L. (2022). What is “Deep Tech” and what are Deep Tech Ventures.

Working Paper. MIT Global Programs.

de Vasconcelos Gomes, L. A., Flechas, X. A., Facin, A. L. F., & Borini, F. M. (2021). Ecosystem management: Past achievements and future promises. *Technological Forecasting and Social Change*, 171, 120950.

Dyer, W. and Wilkins, A. (1991). "Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt", *Academy of Management Review*, Vol. 16 No. 3, pp. 613-619.

Foss, J.; Topan, V.; McCaffrey, M. (2022). The Practical Wisdom of Entrepreneurial Judgment, *Handbook of Practical Wisdom in Business and Management*, eds. Barry Schwartz, Caleb Bernacchio, César González- Cantón, and Angus Robson (Springer, 2022). Available at SSRN: <https://ssrn.com/abstract=4211430>

G. Schuh and C. Hamm. (2022) "Methodology for a Startup Lifecycle-dependent Approach of Financing for Investors and Deep Tech Startups," 2022 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), Kuala Lumpur, Malaysia, pp. 1392-1398, doi: 10.1109/IEEM55944.2022.9989676

Kotter, J. (2013). *Liderando mudanças: transformando empresas com a força das emoções*, Elsevier, Rio de Janeiro.

Kotter, J.A. (2015). *Tenha agilidade estratégica num mundo em constante transformação*, HSM Editora, São Paulo.

Langley, A.; Tsoukas. (2017), *The SAGE Handbook of Process Organization Studies*. SAGE Publications Ltda.

Lewin, K. (1947), "Frontiers in Group Dynamics: Concept, Method, and Reality in Social Science; Social Equilibria and Social Change". *Human Relations*, Vol.1, Issue 1. <https://doi.org/10.1177/001872674700100103>.

Romme, A. Georges L. 2022. "Against All Odds: How Eindhoven Emerged as a Deep Tech Ecosystem" *Systems* 10, no. 4: 119. <https://doi.org/10.3390/systems10040119>

Romasanta, A.; Ahmadova, G.; Wareham, J.; Priego. (2022), "Deep Tech: Unveiling the foundations, ESAD Working Papers Serie 276, available at: <https://ssrn.com/abstract=4009164>

Santos, E.; Queiroz, M.; Borini, F.; Carvalho, D.; Dutra, J. (2023), "The journey of business transformation: unfreeze, change and refreeze – a multiple case study", *Journal of Organizational Change Management*, <https://www.emerald.com/insight/0953-4814.htm>

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Yin, R. (2015), Estudo de caso: Planejamento e métodos, 5nd ed., Bookman, Porto Alegre.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Edilson de Azevedo Santos	Brazil	Universidade de São Paulo	dilsonazevedo362@usp.br
Felipe Mendes Borini	Brazil	Universidade de São Paulo	borini@gmail.com
Fábio José dos Santos	Brazil	Universidade de São Paulo	fjsantos@usp.br
Ana Clara Berndt	Brazil	Universidade de São Paulo	anaberndt@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Impact Innovation: an analysis of the integration of startups in the Innovation Challenge@BIN

TYPE: c. Practical Case/Experience Analyses

TRACK: 7. Entrepreneurship and Startups in Impact Innovation

PURPOSE:

In October 2023, Casa Firjan, the innovation, creativity, and trends environment of the Federation of Industries of Rio de Janeiro (Firjan), hosted the international meeting Business and Innovation Network (BIN)@Rio. Held in partnership with the University of Porto and a network of international institutions, the theme of the event was *Territories and Innovation: How Soft Power Encourages Innovation for Business Growth* and included lectures, workshops, and visits to territories in Rio, such as the Rocinha favela.

One of the highlights of the event's program was the **Bin@Rio Innovation Challenge**, which awarded two startups from Rio de Janeiro that offered solutions to make cities smarter, more humane and more sustainable. To take part in the Challenge, these entrepreneurs went through a process of nominating by innovation ecosystem actors such as incubators and investment funds, and then the analysis of the Internal Evaluation Committee, made up of professionals who work with innovation at Firjan.

Five startups made six-minute pitches to a panel of experts on the subject, including representatives from Rio de Janeiro's Environment Department, the Rio

Operations Center,¹ and actors from Portugal's innovation ecosystem. The challenge therefore sought to form its jury based on the Triple Helix. Thus, the purpose of this practical case is to analyze the tangible and intangible impacts brought forth by the winning startups' participation in BIN@Rio: **Octa City**, from Niterói, and **Delivery das Favelas**, from Duque de Caxias.

Octa City uses Artificial Intelligence to create solutions to urban challenges and develops climate monitoring software that combines 3 technological pillars: Big Data & AI, Data Visualization, and Video Analytics. **Delivery das Favelas** works as a delivery service of various types of products — from food to household appliances — to vulnerable areas where delivery services don't usually reach. Both startups use innovation to develop the territories where they are located.

As a method, this study used bibliographical research to understand the importance of cooperation between companies and institutions to create the conditions to boost impact innovation and develop the territory and to relate these understandings to the BIN Innovation Challenge. It also used data collection through semi-structured interviews with entrepreneurs to understand the impact of this participation on startups.

FINDINGS:

This work identified that the integration of startups with social impact solutions at the BIN@Rio event provided gains for entrepreneurs on two fronts: tangible and intangible:

Tangible: With the R\$10,000 it received, **Octa City**, which placed first in the challenge, used the money to expand its technological base and thus expand its operations to the city of Campos dos Goytacazes, in the north of Rio de Janeiro. The money also made it possible to invest in a camera park to test new business solution hypotheses. The startup **Delivery das Favelas** invested R\$5,000 in paid traffic on social media. As a result, the site has seen a 30% increase in hits, a necessary visibility for the

¹ Through cameras spread throughout the city, the Rio Operations Center monitors the city of Rio de Janeiro and allows solutions to be anticipated in crisis scenarios.

startup, which is currently looking for new partners, according to CEO Anderson Marcelo Fernandes.

Intangible: After taking part in BIN@Rio, Octa City's CEO Otávio Flaeschen says that one of the most strategic gains was, in addition to expanding his network of contacts, **the change in his outlook on the positioning of his own business.** *“After talking to Professor João Cartesão, from 4TU.Federation,² I realized that what Octa City develops in Rio can also be developed in other countries. Talking to this professor, I realized that the urban challenges we face in Rio de Janeiro are also global. This conversation opened up my horizons and helped me reposition Octa City in the market.”* According to Otávio, having the participation of different players from the Triple Helix at the event was fundamental in changing the way he looks at what he does.

In the wake of this process of intangible gains, Anderson Fernandes, from Delivery das Favelas, explains that winning the Desafio@BIN award has helped strengthen his startup's reputation. *“Having the award in our portfolio creates value when we present ourselves to potential clients. The companies we are looking to partner with are interested in hearing about the experience and this helps a lot in building our image.”*

Based on the entrepreneurs' accounts, it can be said that holding events such as BIN@Rio and, within it, the Innovation Challenge, in a space that has consolidated itself as an environment for discussions on innovation, Casa Firjan helps small entrepreneurs to increase the visibility of what they do, to deepen discussions that can improve their core business and, finally, to connect with players in the innovation ecosystem, a network that is fundamental to the present and future of these companies.

ORIGINALITY/VALUE

This practical case sees as original the fact that the BIN Innovation Challenge was part of an international event that brought entrepreneurs, researchers, and other European leaders into contact with impact businesses operating in vulnerable territories, such as Rocinha. To make this contact more tangible, the event organized a visit to the

² Dutch federation that brings together four universities of technology and carries out research, education, and knowledge transfer.

area so that everyone could get to know the local businesses that are part of the area's Social, Technological, and Environmental Innovation Park (PISTA), an articulation that involves different social actors and works to unite the favela and innovation as public policy.

PRACICAL SOCIAL/IMPLICATIONS

As a value, this work delivers the expansion of an innovation award not only for startups linked to innovation environments attached to universities but also for businesses in impact communities, extending the Triple Hilex concept to civil society and communities in social and economic vulnerability.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

This case study refers to a specific case at Firjan and cannot be generalized to other contexts. As a recommendation for future studies, a comparison could be made with other similar entities to identify relevant aspects that could add to the construction of knowledge in the field.

KEYWORDS: Territory development; Impact Innovation; Innovation Award; Entrepreneurship; Triple Hilex

REFERENCES

FEDERAÇÃO, DAS INDÚSTRIAS DO ESTADO DO RIO DE JANEIRO (FIRJAN). **Firjan IEL premia startups durante o BIN@Rio. Rio de Janeiro, 2023.** Disponível em: <https://www.firjan.com.br/noticias/desafio-inovacao-bin-firjan-iel.htm> Acesso em: 25/03/2024.

FEITOSA, C. O. A importância da inovação para o desenvolvimento econômico local. **Economia Política do Desenvolvimento**, v. 4, n. 12, p. 29-50, 2011.

JOSÉ, Leonardo. Favela além do estereótipo: primeiro parque de inovação social em favelas do Brasil valoriza a potência da Rocinha. **CIEDS**, Rio de Janeiro, 28/04/2024. Disponível em: <https://www.cieds.org.br/noticia/favela-alem-do-estereotipo-primeiro-parque-de-inovacao-social-em-favelas-do-brasil-valoriza-a-potencia-da-rocinha> Acesso em: 26/03/2024.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Julia Bloomfield Gama Zardo	Brazil	Inovation manager at Federation of Industries of Rio de Janeiro (Firjan) Entrepreneurship teacher at Pontificia Universidade Católica do Rio (PUC-RIO)	jzardo@firjan.com.br
Natany Paz Borges	Brazil	Inovation Specialist at Federation of Industries of Rio de Janeiro (Firjan)	npborges@firjan.com.br
Marcos André Farias de Oliveira	Brazil	Projects Specialist at Federation of Industries of Rio de Janeiro (Firjan)	MAFDOLIVEIRA@firjan.com.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: A BIBLIOMETRIC STUDY ON THE GROWTH OF RESEARCH IN SCIENCE-BASED STARTUPS

TYPE: an original research

TRACK: 7. Entrepreneurship and Startups in Impact Innovation

PURPOSE: In view of the importance of research and innovation development activities by academia (Valkokari, 2015), it is necessary to know the evolution of research that leads to the development of Hard Technology by Deep Techs. Therefore, the present research aims to carry out an analysis of the evolution of scientific production within the scope of Deep Tech startups.

DESIGN/METHODOLOGY/APPROACH: This research seeks to present the evolution of scientific and technological production on scientific-based startups, known as Deep Techs, through a bibliometric review. In this way, a survey of studies published on the topic was carried out in the Web of Science database from its first publications, in 1983, until 2023. It was decided to carry out the research using the keywords “Deep Tech*”, “Technological- based startup*”, “Scientific-based startup*”, “Scientific Startup*”, “Entrepreneur* scientist”, “Research-oriented entrepreneur*” and “knowledge-intensive entrepreneurship*” with the appropriate Boolean operators. Data was collected until the date of the research, in December 2023, and analyzed in Excel. Finally, a discussion of articles on knowledge, entrepreneurship and innovation ecosystems was held.

FINDINGS OR EXPECTED OUTCOMES: It is noteworthy that the year of 2023 recorded the highest number of citations, which reflects the growing importance attributed to research related to entrepreneurship and hard science. The results point to a scenario with emphasis on the development of new hard technologies and the exchange of information and joint development of research regarding deep

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

techs in different areas (Dionisio, 2023; Clarysse, et al. 2014).

It was observed that China and the United States are the main producers of research. China with research focused on biotechnology and hard science topics, indicating the development of a solid knowledge ecosystem. The results also point to the main funding agencies being from China and all public for research development, which is important for the development of hard deep techs. The United States, the country with the second-largest volume of publications, emphasizes research in the areas of business, management, and economics, with a particular focus on studying the relationship between ecosystems and the role of entrepreneurial scientists. This diversity of approaches highlights the complexity and scope of the topic of Deep Tech Startups, highlighting the need for a multifaceted understanding for its study and development (Salles-Filho, et al., 2023).

As for ecosystems, there was a growing interest among researchers in the influence of the knowledge ecosystem on the performance and innovation of Deep Techs (268 articles). This emphasizes the need for a comprehensive approach that encompasses not only the technological aspects, but also the collaborative support of ecosystems in the development of Deep Tech startups. In turn, the entrepreneurship ecosystem focuses on the actors and activities that surround this ecosystem. The figure of universities and TTOs are examples of this concern. In the case of innovation ecosystem articles, there is a concern with business resources and entrepreneurial innovation systems. These are concerns regarding the resources and capabilities that the innovation or innovative company will have to deliver value upon arrival to the market (Autio e Thomas, 2022).

ORIGINALITY/VALUE: The originality of this study lies in carrying out a bibliometric analysis to understand the evolution of research related to Deep Techs along with an analysis of the involvement of knowledge, entrepreneurship and innovation ecosystems. Thus, it is possible to open research gaps regarding the impact of ecosystems on the evolution of Deep Techs.

PRACTICAL/SOCIAL IMPLICATIONS: This research contributes to theory by presenting an updated view on research in this emerging field of Deep Techs. This research allows us to identify trends,

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

knowledge gaps and areas of growing interest within the world of advanced technology startups. Furthermore, by mapping the presence of ecosystems in articles related to the topic, it was possible to discuss the interaction between different ecosystem actors in the development of these companies.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: As limitations, first, the scarcity of a larger sample of articles related to the topic may have restricted the scope of the conclusions reached. Additionally, the use of a single data source, the Web of Science, may have introduced bias in the results, since other sources of information could provide complementary perspectives on the subject. Therefore, it is suggested that future investigations seek to overcome these limitations, using more representative samples and considering multiple data sources for a broader and more accurate analysis in the context of Deep Tech startups. An analysis of future research trends in Deep Techs and ecosystems is also suggested to expand understanding of the topic.

KEYWORDS (3-5): Deep Techs; Startup; Ecosystems; Bibliometric Research.

REFERENCES

Autio, E. and Thomas, L.D.W. (2022), "Researching ecosystems in innovation contexts", *Innovation & Management Review*, Vol. 19 No. 1, pp. 12-25. <https://doi.org/10.1108/INMR-08-2021-0151>.

Clarysse, B., Wright M., Bruneel J., Mahajan A. (2014). Creating value in ecosystems: Crossing the chasm between knowledge and business ecosystems, *Research policy* 1164-1176.

Salles-Filho, S., Fischer, B., Juk, Y. et al. (2023). Acknowledging diversity in knowledge-intensive entrepreneurship: assessing the Brazilian small business innovation research. *J Technol Transf* 48, 1446–1465. <https://doi.org/10.1007/s10961-022-09976-4>.

Valkokari, K. (2015). Business, innovation, and knowledge ecosystems: How they differ and how to survive and thrive within them. *Technology Innovation Management Review (TIM Review)*, 5(8), 17-24. <http://timreview.ca/article/919>.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Erika Silva de Oliveira	Brazil	USP	Erikasilvadeoliveira02@usp.br
Gabriel Mioranza de Medeiros	Brazil	USP	gabriel.demedeiros6@usp.br
Fábio José dos Santos	Brazil	USP	fjsantos@usp.br
João Paulo Nascimento da Silva	Brazil	USP	jpnsilvas@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Sebrae São Paulo's experience in fostering scientific startups in the State of São Paulo: the case of "Lab Vendas Startups Científicas"

TYPE (c. practical case / experience analysis)

TRACK: (Indicate one Track described in the Call for Abstracts, pages 4 and 5:

7. Entrepreneurship and Startups in Impact Innovation.

<https://triplehelixconferencebrazil.com/wp-content/uploads/2024/03/call-for-abstracts-THC2024-v20240308-v2.pdf>)

PURPOSE: This paper aims at telling the story of one of Sebrae-SP's programs dedicated to scientific and technological-based startups and its results and insights. We focus on the startups served from 2021 to 2023, especially the more advanced ones, participating at Lab Vendas Startups Científicas, a program designed to connect mature startups to potential corporate clients, so they can initiate a commercial relationship as to making a sale or engaging in collaborative innovation (open innovation). We consider the characteristics of the commercial relationship between startups and the corporations, the frictions, the learnings and some insights that can be of interest to the innovation ecosystem.

DESIGN/METHODOLOGY/APPROACH: This is a practitioner report, based on telling the story of a particular case of one of Sebrae-SP's programs - Lab Vendas Startups Científicas - specifically communication some of its results and the insights that can be shared with other actors of the innovation ecosystem.

FINDINGS OR EXPECTED OUTCOMES:

The case to be presented relies on qualitative analyses and sharing of learnings. The lessons learned - which will be further developed in the paper - concern (i) the startup-company relationship and the frictions existing in this relationship for businesses to materialize; (ii) the relationship between innovation

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

areas and the technical and business areas of each partner corporation; (iii) internal difficulties of large companies to buy technological solutions from startups or carry out collaborative innovation projects with startups, and finally, (iv) some behavioral aspects of startup entrepreneurs, so that they are able to negotiate and conclude deals with large companies

ORIGINALITY/VALUE:

This paper is a practitioner report, it does not aim to establish direct cause-and-effect relationships, isolate influencing factors, or prove the statistical validity of conclusions or research originality, but rather to tell the successful ongoing story of Sebrae for Startups in its endeavor to boost the São Paulo innovation ecosystem with various initiatives supporting digital and scientific startups.

PRACTICAL/SOCIAL IMPLICATIONS:

This case allows us to understand the role of Sebrae-SP as an agent of economic development, which, being neither a government entity nor a private company, but rather a nonprofit private entity, with its own resources, it manages to significantly impact the innovation ecosystem, contributing to changing the landscape of innovative entrepreneurship in the State of São Paulo, by means of several initiatives and programs, one of which is described in the case to be presented.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

The case to be presented has the limitation of being a practitioner report and not an academic study. In a further opportunity, we can develop a paper that will consider literature and theoretical background, in order to get closer to an academic paper.

KEYWORDS (3-5) Scientific startups, deep techs, open-innovation, corporations

REFERENCES

As a practical case, the paper does not use specific literature references and theoretical background, but

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

mainly storytelling.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Maria Augusta Pimentel Miglino	Brazil	Sebrae-SP	mamiglino@gmail.com
Ana Carolina Calçado Lopes Martins	Brazil	Wylinka	ana.calcado@wylinka.org.br
Elena Maria Duarte de Oliveira	Brazil	Wylinka	elena.oliveira@wylinka.org.br
Yaankha Bhárbara Allecxandria	Brazil	Wylinka	yaankha@wylinka.org.br
Priscila Martinho Pinheiro	Brazil	Wylinka	priscila.pinheiro@wylinka.org.br
Débora Zanoni do Prado	Brazil	Wylinka	
Olivia Boretti	Brazil	Wylinka	
Tatyane Sales de Araújo Batista	Brazil	Wylinka	tatyane.sales@wylinka.org.br
Paulo Mendonça	Brazil	Wylinka	tatyane.sales@wylinka.org.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Startups Strategies for Impactful Innovation: How Open Innovation Influences Product and Services Innovation and Organizational Performance on Brazilian startups

TYPE: A - Original research

TRACK: 7 - Entrepreneurship and Startups in Impact Innovation (focus theme: Encouraging Entrepreneurship and Startups for Impactful Innovations).

PURPOSE: Open innovation is a consolidated practice in Brazilian companies, providing efficiency in problem solving, competitive advantage, customer attraction and cost savings. Companies of this type constantly seek to improve innovation in their products, aiming for continuous improvements and high organizational performance to ensure profitability and longevity. Therefore, this study aims to analyze the influence of Open Innovation on Product and Service Innovation and Organizational Performance in Brazilian startups.

DESIGN/METHODOLOGY/APPROACH: This is a quantitative, descriptive and cross-sectional research. The initial population was defined based on data from ABSTARTUPS (Brazilian Association of Startups), which was formed by 14,000 companies in 2022. A proprietary database was then built and data was refined to eliminate errors (such as duplicate records, unfound contact telephone numbers and companies that were no longer active) leading to a final population of 1,700 companies. Finally, a non-probabilistic sample was selected for accessibility, consisting of 112 startups, with respondents occupying leadership positions to be surveyed. Data analysis was performed through structural equation modeling using SmartPLS software, examining the relationships between the model constructs and testing three established hypotheses.

FINDINGS: Two hypotheses were sustained. The first one, the positive influence of Open Innovation in Products and Services Innovation, as a way to offer collaboration opportunities that positively influence companies ability to develop innovative products and services; and the second one, the influence of of Open Innovation in Organizational Performance which influences key indicators such as return on investment, increased sales and long-term profitability. However, the direct relationship between Product and Service Innovation and Organizational Performance wasn't confirmed.

ORIGINALITY/VALUE: This study has its greatest value since, by proving the influence of Open Innovation on Product and Service Innovation, it became evident that the use of the Triple Helix can be used as a crucial strategy for creating competitive products and services.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

PRACTICAL/SOCIAL IMPLICATIONS:

Finding suggests that managers should seek collaboration and partnerships between companies, universities or governmental initiatives, as this enhances the share of knowledge, technologies and resources, benefiting each other and achieving features that individually could be unattainable. By adopting open innovation, companies strengthen their ability to drive technological advances, optimizing the exchange of knowledge and, consequently, generate more commercial opportunities. Lastly, managers should be attentive to improving and promoting existing products/services or offering new ones may not be sufficient to improve sales and achieve profitability.

As for social implications, as the Triple Helix was found as a possible strategy in the positive influence of Open Innovation on Product and Service Innovation it is expected that, when used, several opportunities for government and public universities to promote economic and social development can be put in place, generating unimaginable possibilities.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

In a broad scope, the limitations of this research prevent the generalization of the results. The nature of the model and the composition of the sample, associated with the subjective approach to measuring organizational performance, represent the main restrictions.

It is suggested for future investigations, incorporating more respondents, as also, sectoral diversity. Longitudinal studies could offer insights into the evolution of the relationship between open innovation and organizational performance over time. The combination of qualitative and quantitative methodologies, in addition to the exploration of mediating or moderating variables, such as organizational culture and management structure, is also recommended. Comparative studies between Brazilian companies and those from other countries and the integration of subjective and objective metrics in the assessment of organizational performance are important aspects to be considered.

KEYWORDS (3-5): Open Innovation; Product and Services Innovation; Organizational Performance; Startups; Triple Helix; Tech-based Companies.

REFERENCES

- Alegre, J., & Chiva, R. (2013). Linking entrepreneurial orientation and firm performance: The role of organizational learning capability and innovation performance. *Journal of small business management*, 51(4), 491-507.
- Avlonitis, G. J., Papastathopoulou, P. G., & Gounaris, S. P. (2001). An empirically-based typology of product innovativeness for new financial services: Success and failure scenarios. *Journal of Product Innovation Management: an international publication of the product development & management association*, 18(5), 324-342.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

- Battisti, G., Gallego, J., Rubalcaba, L., & Windrum, P. (2015). Open innovation in services: knowledge sources, intellectual property rights and internationalization. *Economics of Innovation and New Technology*, 24(3), 223-247.
- Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management*, 31(6), 515-524.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly*.
- De Souza Bido, D., & Da Silva, D. (2019). SmartPLS 3: especificação, estimação, avaliação e relato. *Administração: Ensino e Pesquisa*, 20(2), 488-536.
- De Las Heras-Rosas, C., & Herrera, J. (2021). Research trends in open innovation and the role of the university. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 29.
- Gomes, G., & Wojahn, R. M. (2017). Organizational learning capability, innovation and performance: Study in small and medium-sized enterprises (SMES). *Revista de Administração (São Paulo)*, 52, 163-175.
- Migdadi, M. M. (2019). Organizational learning capability, innovation and organizational performance. *European Journal of Innovation Management*, 24(1), 151-172.
- Saura, J. R., Palacios-Marqués, D., & Ribeiro-Soriano, D. (2023). Exploring the boundaries of open innovation: Evidence from social media mining. *Technovation*, 119, 102447.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Ana Clara Berndt	Brazil	USP	anaberndt@usp.br
Bianca Carvalho da Silva	Brazil	FURB	biancacarvalho@furb.br
Giancarlo Gomes	Brazil	FURB	giancarlog@furb.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Vírgula Innovation Hub VR – Triple Helix in Practice

TYPE: original research

TRACK: 7.4 Innovation habitats: TH experiences of tech parks, accelerators, incubators

PURPOSE: The Vírgula Innovation Hub VR is a physical and virtual space that provides a platform for people from various fields, such as academia, business, government, and society, to interact with each other. It was established in October 2022 to promote innovative entrepreneurship, support businesses, and contribute to the socio-economic development of the Southern Fluminense region of the State of Rio de Janeiro, particularly in Volta Redonda. The Fluminense Federal University (UFF) and the Secretary of Economic Development and Tourism of Volta Redonda (SMDet/PMVR) collaborated to create this space. Additionally, several partners such as Volta Redonda Chamber of Shopkeepers (CDL-VR), Volta Redonda University Center (UNIFOA), Geraldo Di Biase University Center (UGB), and SEBRAE-RJ have joined hands to make it a success. The primary purpose of Vírgula is to foster the practical application of the Triple Helix model.

METHOD/RESEARCH DESIGN: This work follows the action research method and involves actors participating in hub management and reflecting on its trajectory. To begin with, we collected documents such as meeting minutes, planning documents, and annual reports of Vírgula. Next, we conducted interviews with leaders of actors who initiated the journey, transcribed them, and analyzed them from the perspective of innovation theories such as Open Innovation and Triple Helix. We also monitored Management Committee meetings biweekly throughout 2022 and 2023.

FINDINGS OR EXPECTED OUTCOMES: The Vírgula Innovation Hub VR is a new institutionality formed by a consortium of organizations involving actors from the university-business-government spheres. The proposal is to be effectively a "bridge for innovation," that is, to bring together actors developing knowledge and technology with those who need these elements, acting as a knowledge broker. Since the start of the operation 18 months ago, approximately one million reais have been invested, part of which was obtained from FAPERJ. In addition to the six founders, other entities were engaged as partners and negotiations are ongoing. The hub currently has a coworking space and an event agenda to disseminate entrepreneurship and innovation in the region, which still has a very traditional culture linked to heavy industry. New environments, such as maker space and podcast room, are being implemented. Additionally, SEBRAE has been working on business acceleration. The project's governance, formed by a management committee with a representative from each founder, balances the actors' interests, enhances the exchange of information and knowledge, and mitigates conflicts inherent in different interests and actions. Leadership roles are mainly identified in the figure of the secretary of economic development, who has already worked in several organizations and was able to articulate partnerships that made the project viable.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

(Triple Helix's people circulation concept). Business sector leaders were consulted during the hub's design and subsequently engaged through the participation of the Volta Redonda Chamber of Shopkeepers and the regional office of SEBRAE-RJ. SEBRAE mapped the region's innovation ecosystem, which also allowed the identification of relevant actors and demands. The concepts of Open Innovation and Triple Helix are at the core of the hub's planning, as well as the concepts of entrepreneurial capacity (e-cap) and innovation capacity (i-cap). Conceptually, the hub creation exercise is also a conceptual exercise of tying together various theories.

ORIGINALITY/VALUE: The article is the first academic work on the Vírgula Innovation Hub. Its value lies in being a descriptive article about the hub and analyzing it from the perspective of innovation theories.

PRACTICAL/SOCIAL IMPLICATIONS: This study can support the reflection of participating actors on Vírgula itself, aiming at its future development. Additionally, it can support the creation of other similar hubs.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: It may be interesting to broaden the scope of field research by conducting interviews with other project participants, partners, and users to gain insight into each actor's perspective on the initiative. This approach also helps increase actor engagement. Additionally, it is essential to note that the hub operates on projects, so it may be helpful to study initiatives individually and determine their effectiveness. The action research method has limitations since the authors are actively involved in daily activities, which could result in an official and descriptive view of the phenomenon without the ability to understand it from an appropriate distance. Nevertheless, this limitation has been mitigated since all authors are experienced academics.

KEYWORDS (3-5): Triple Helix, Vírgula Innovation Hub VR, regional economic development, entrepreneurship, innovation.

REFERENCES

- AMARAL, M.; MINEIRO, A. A. C.; FARIA, A. F. (2022). *As Hélices de Inovação – Interação Universidade-Empresa-Governo-Sociedade no Brasil*. CRV Editora, 556 páginas
- AMARAL, M.; FARIA, A.; SCHOCAIR, M. (2020). Assessing the Innovation Environment of the Research Triangle Region. *Revista de Administração, Sociedade e Inovação*, v. 5, n. 2, p. 90-111. <https://doi.org/10.20401/rasi.6.2.386>
- BUDDEN, P.; MURRAY, F. (2019). An MIT Approach to Innovation: eco/systems, capacities & stakeholders. MIT's Laboratory for Innovation Science & Policy. Working Paper. October
- BUDDEN, P.; MURRAY, F.; TURSKAYA, A. (2019). A systematic MIT approach for assessing 'innovation-driven entrepreneurship' in ecosystems. MIT's Laboratory for Innovation Science & Policy. Working Paper Version 2.0. February.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CARAYANNIS, E. G. et al. (2017). The ecosystem as helix: an exploratory theory-building study of regional co-opetitive entrepreneurial ecosystems as Quadruple/Quintuple Helix Innovation Models. *R&D Management*.

CHESBROUGH, H. W. (2003) Open innovation. Harvard Business School Press

MORRIS, L. (2006). Permanent innovation

VIRGULA HUB DE INOVAÇÃO VR (2022, 2023). Relatório anual.

_____. (2023). Planejamento Estratégico 2023.

_____. (2022). Documento Base. Versão 1.3.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Marcelo Amaral	Brazil	Fluminense Federal University (UFF)	marceloamaral@id.uff.br
Camila Aparecida Maciel Silveira	Brazil	Fluminense Federal University (UFF)	camilasilveira@id.uff.br
Marcela Sayumi de Souza Ito	Brazil	Fluminense Federal University (UFF)	marcelasayumi@id.uff.br
Sérgio da Silva Sodré	Brazil	Secretary of Economic Development and Tourism of Volta Redonda (SMDET/PMVR)	smsodre2011@gmail.com
Ricardo Henriques Leal	Brazil	Fluminense Federal University (UFF)	rhleal@id.uff.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: A University spinoff creation journey and how its collaborations with academia and government have helped it in its pathway to the market.

TYPE (c. practical case / experience analysis)

TRACK:

7. Entrepreneurship and Startups in Impact Innovation

PURPOSEs:

The purpose of this practical case is to show the creation of a spinoff from the University of Campinas (Unicamp), called Rubian Extratos, and the many steps it went through including technology licensing, incubation, funding, etc, in order to reach the market. The case shows how a rising Company can benefit from some university and government programs, which facilitate interaction between academia, government and industry – the triple helix model for innovation.

Moreover, another goal is to show to entrepreneurs the importance to focus in real challenges and market needs, to develop to deliver impactful innovation and fit to market.

DESIGN/METHODOLOGY/APPROACH:

In 2014 a group of 4 undergraduate engineering students joined an entrepreneurship challenge competition known as “Desafio Unicamp” (Unicamp Challenge) organized by Inova Unicamp. The goal of the Challenge is to build a business model based on one of Unicamp technologies, as if, the participant team were a Company. The first competition activity was to expose the students to several patents of Unicamp’s patent portfolio for them select one of them to be the base for the business model development.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Technology is a very attractive start point for students and startups to design innovative solutions. However, this can be very tricky if entrepreneurs do not have a clear idea of what are the client needs. It is very important to educate the future entrepreneurs that innovation only succeeds if the client or the user is at the center of the challenge in a deep empathic way. With this in mind, the team succeeded in the Unicamp Challenge, as a top 3 winner, and, as a result, the members of the team decided to found a startup named Rubian Extratos. The team business mentor, a retired R&D executive, delighted with the outcomes achieved by the team also decided to join Rubian as a founder and partner.

The base technology/field worked by Rubian was “Novel Extraction Technologies” and “Bioactive Botanical Extracts for Health Care” applications. Therefore, they started licensing from Unicamp a technology for supercritical CO₂ extraction. The startup was also encouraged to take part in the incubation program provided by Unicamp Technology-based Business Incubator (Incamp) for 3 consecutive years. In this program, the startup received mentorship and support to develop its business and product to go to the market. In parallel, in order to run technical developments, Rubian was granted funding from the PIPE program run by the São Paulo Research Foundation (FAPESP).

As the years passed, the University worked closely with Rubian to facilitate the licensing of three other technologies. Moreover, two additional co-owned patents were filed in INPI, the Brazilian National Institute of Industrial Property, as a result of joint developments in collaboration agreements. Rubian was also granted more funding from FAPESP and FINEP (Brazilian Financier of Studies and Projects) and was able to attend the acceleration program PIPE Empreendedor held by FAPESP which is based in the I-Corps, a business program created by the U.S. NSF.

FINDINGS OR EXPECTED OUTCOMES:

Rubian’s purpose is to work as a bridge connecting academia scientific background, market opportunities and the needs in the Health & Wellbeing areas. It is a strategic to Rubian to be connected with Unicamp labs since technologies and scientific background are imperative to business.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

This case, demonstrates that it is possible for entrepreneurs to turn to academia for cutting edge technologies, by licensing technologies developed in the University and/or developing a collaborative research project together. At the same time, universities need companies, to further develop its normally early stage technologies, to create a product and go to the market. Moreover, the product development must be centered in the clients needs.

Also, the case shows that university programs such as incubation and government programs for funding can help newly created companies to navigate its first obstacles in order to reach the market.

Today, Rubian works in the development and production of botanical extracts rich in bioactives, with safety, efficacy and transparency. Its proposal is “Clear by Design Extracts”, a reference pathway for Rubian future development, containing four pillars: Screening of the best botanicals with functional bioactivity; Use of clean and green technologies to obtain functional bioactives with no degradation and no hazard solvents left behind; Proving through high level and reliable methodologies the products safety, performance and the attendance to regulatory requirements; and Prioritize sustainable and renewable resources using upcycling, biorefinery processes and operational synergies.

Rubian has already successfully launched 4 products in the Brazilian and European market in different segments like supplements, cosmetics and beverage aroma additive. More products from pipeline are under development and planned for commercialization soon.

ORIGINALITY/VALUE:

The value of this case lies in: the close collaboration the Company maintained with Unicamp labs along the years for technologies and scientific background, resulting in technology licensing and research collaborations, incubation, etc; the constant search of the Company for funding opportunities and other programs in the government but also market investors; and the clear Rubian guideline to focus on clients needs.

PRACTICAL/SOCIAL IMPLICATIONS:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Collaboration between Rubian, Academia and government, played an important role on the Company development and survival in its pathway to the market. In addition, the research done in the Academia was responsible for training students for research. On the other hand, the creation of a new Company created new jobs. The industry, in turn, absorbed new technologies. Finally, the society can benefit from technologies developed in the university and enhanced in industry, such as cleaner and greener processes for bioactive plant extraction.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Rubian is still working closely with university in further developments of the licensed technologies and it keeps track of the new researches and technologies being developed in the university. More products from pipeline are under development and planned for commercialization soon.

KEYWORDS (3-5) : Innovation, collaboration, funding, licensing, entrepreneurship

REFERENCES

Rubian Extratos <<https://www.rubian.com.br/>>. Acesso em: 30/03/2024.

Unicamp – University of Campinas <www.unicamp.br>. Acesso em: 30/03/2024.

Inova – Innovation Agency of the University of Campinas <<https://www.inova.unicamp.br/>>. Acesso em: 30/03/2024.

Incamp - Unicamp Technology-based Business Incubator <<https://www.inova.unicamp.br/tag/incamp/>>. Acesso em: 30/03/2024.

Desafio Unicamp – Unicamp Challenge <<https://www.inova.unicamp.br/desafio/>>. Acesso em: 30/03/2024.

FAPESP - São Paulo Research Foundation <<https://fapesp.br/>>. Acesso em: 30/03/2024.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

PIPE FAPESP - Innovative Research in Small Businesses Program – PIPE <<https://fapesp.br/pipe/>>.

Acesso em: 30/03/2024.

PIPE EMPREENDEDOR <<https://fapesp.br/pipe/empreendedor/>>. Acesso em: 30/03/2024.

NSF - U.S. National Science Foundation <<https://www.nsf.gov/>>. Acesso em: 30/03/2024.

I-Corps <<https://new.nsf.gov/funding/initiatives/i-corps>>. Acesso em: 30/03/2024.

FINEP - Brazilian Financier of Studies and Projects <<http://www.finep.gov.br/>>. Acesso em: 30/03/2024.

INPI – Brazilian National Institute of Industrial Property <<https://www.gov.br/inpi/pt-br>>. Acesso em: 30/03/2024.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Eduardo Aledo	Brazil	Rubian Extratos	eduardo.aledo@rubian.com.br
Beatriz Hargrave Gonçalves da Silva	Brazil	Inova Unicamp	beatriz.silva@inova.unicamp.br
Iara Regina da Silva Ferreira	Brazil	Inova Unicamp	iara.ferreira@inova.unicamp.br

08

Collaborative Research and Development

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: The open and collaborative research practices through the Open Innovation in Science (OIS) in Science and Technology Parks: a case study.

TYPE: Original Research.

TRACK: 8. Collaborative Research and Development.

PURPOSE: New ways of producing knowledge and creating value studied in the Open Innovation (OI) field, including in Science and Technology Parks (STPs) considered an important tool to connecting industry and academia are attracting increasing attention from scholars and practitioners alike (Narasimhalu, A. D., 2013; Şimşek, K., & Yıldırım, N., 2016; Silva, S. E., Venâncio, A., Henriques, I. C., Sobreiro, V. A., & Kimura, H., 2018; Silva, J. R., & Gonçalves, C. A., 2020; Bayat, P., Daraei, M., & Rahimikia, A., 2022). One of these ways is Open Innovation in Science (OIS) builds upon OI research by adopting its attention to boundary-crossing knowledge flows and by adapting other concepts developed and researched in OI to the science context (Beck, S., Bercovitz, J., Bergenholtz, C., Brasseur, T., D’Este, P., Dorn, A., ... & Zyontz, S., 2021; Beck, S., Grimpe, C., Poetz, M., & Sauermann, H., 2022; Beck, S., Bergenholtz, C., Bogers, M., Brasseur, T. M., Conradsen, M. L., Di Marco, D., ... & Xu, S. M.; 2022). The concept of OIS provides a framework that integrates dispersed knowledge on Open Innovation, Open Science, and related concepts such as Responsible Research and Innovation by proposing a unifying frame to study openness and collaboration in scientific research (Beck, S., LaFlamme, M., Bergenholtz, C., Bogers, M., Brasseur, T. M., Conradsen, M. L., ... & Xu, S. M.; 2023). Openness and collaboration can foster breakthroughs in science and science-based innovation (Poetz, M., Beck, S., Grimpe, C., & Sauermann, H.; 2024). To achieve this, it is essential to develop the appropriate mindset to manage complexity to manage complexity and generate Triple-Helix relations and potential synergies to catalyze knowledge and transform it into relevant innovations for society, because the effectiveness of an innovation system depends on the “synergy” of interaction between actors, which can be generated under

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

specifiable conditions (Ivanova, I., 2024; Cruz-Sandoval, M., Moreno-Romo, A., Bosch-Gómez, S., & Ramírez-Montoya, M. S.; 2024). The main purpose of this research is to evaluate the open and collaborative research practices through the OIS in STPs which, due to their proximity of academic and industrial research can create a climate of symbiosis where multiple synergies for innovation are present.

DESIGN/METHODOLOGY/APPROACH: The research strategy adopted is a case study based on the epistemological approaches of Yin (1994, 2015), Eisenhardt (1989, 2007) and Stake (1995) which aims to understand how open and collaborative practices along the entire process of generating and disseminating scientific insights and translating them into innovation. We discuss the elements of the OIS Research Framework, moving from OIS practices and antecedents and boundary conditions to OIS-based outcomes and impacts with recurrent interrelationships in an internationally renowned technology park linked to one of the main non-state universities in Brazil. It was created more than 25 years ago and has companies in the areas of Information Technology, Semiconductors, Automation and Engineering, Communication and Digital Convergence, Health Technologies and Renewable Energy and Socio-Environmental Technologies. Currently, there are 96 national and international companies, a turnover of more than R\$2.5 billion and around 120 intellectual property registrations and its governance constituted in the Triple-Helix Model.

FINDINGS OR EXPECTED OUTCOMES: The findings suggest specific exchange relationships and translation services between science and the STP. First, OIS practices aimed at translating the scientific research into innovation through shared scientific infrastructure to promote interdisciplinary collaborations and market-oriented knowledge transfer in partnership with industry actors to co-create and apply scientific research. Second, there are a series of contingencies and boundary conditions at multiple levels, involving research groups composition and organizational infrastructure and internal policies and protocols to foster collaboration as a result of public policies that emphasize the transfer of university research to industry as a means of unlocking economic growth. Third, the different types of OIS-based outcomes, as well as the scientific and societal impacts, that ensue along the entire scientific process, from the translation of scientific research into innovation by applied research and transfer embrained and encoded knowledge, and embodied and embedded knowledge as well as technical testing and analysis services.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Outcomes are not restricted to finished products or technical knowledge; they include intellectual or material products and activities at earlier stages of the research process as well as tacit outcomes that are harder to codify. Scientific and societal impacts refer to the consequences of the knowledge produced through the application of OIS practices.

ORIGINALITY/VALUE: Understanding open and collaborative research practices through the OIS in STPs demonstrates originality, as it advances the logic of OI that grounded the OIS research framework, in addition to academic value as both academia and industry seek opportunities for capturing value in open and collaborative research, demonstrating that it is a problem needing better solutions.

PRACTICAL/SOCIAL IMPLICATIONS: The understanding of open and collaborative research practices through the OIS in STPs and stands to have important implications for the spheres of practice on the OIS Research Framework, moving from OIS practices and antecedents and boundary conditions to OIS-based outcomes and impacts, and policy of social nature by generating insights into the power of open and collaborative practices that have the potential to allow us to produce more novel and impactful scientific knowledge, to meet the Grand Challenges and, in doing so, to better serve the purposes of science opening up the process of scientific knowledge production and dissemination.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: In the following, we outline selected directions for future research that emerges from our discussion of open and collaborative research practices through the OIS in STPs but also the OIS framework more generally. First, more research is needed on potential differences across scientific fields, as there may be different open and collaborative research approaches between disciplines. Second, future research is needed on the individuals involved in such efforts, such as researchers. Third, openness and collaboration do not occur in isolation but based on the adaptation to the context, indicating the possibility of exploring open and collaborative research practices through the OIS beyond STPs. Study limitations are related to the research strategy adopted, as case studies are not generalizable to the population (statistical generalization); however they can be used to expand and generalize theories (analytical generalization) to further describe applications to practice. Still,

it is important to highlight the limitations of this study related to the theoretical framework adopted and the empirical context explored.

KEYWORDS (3-5): Open Innovation, Open Innovation in Science, Open Science, Science and Technology Park, University-industry Collaboration.

REFERENCES

- Bayat, P., Daraei, M., & Rahimikia, A. (2022). Designing of an open innovation model in science and technology parks. *Journal of Innovation and Entrepreneurship*, 11(1), 4.
- Beck, S., Bercovitz, J., Bergenholtz, C., Brasseur, T., D'Este, P., Dorn, A., ... & Zyontz, S. (2021). Experimenting with open innovation in science (ois) practices: a novel approach to co-developing research proposals. *CERN IdeaSquare Journal of Experimental Innovation*, 5(2), 28-49
- Beck, S., Bergenholtz, C., Bogers, M., Brasseur, T. M., Conradsen, M. L., Di Marco, D., ... & Xu, S. M. (2022). The Open Innovation in Science research field: a collaborative conceptualisation approach. *Industry and Innovation*, 29(2), 136-185.
- Beck, S., Grimpe, C., Poetz, M., & Sauermann, H. (2022). Introduction to the special issue on open innovation in science. *Industry and Innovation*, 29(2), 131-135.
- Beck, S., LaFlamme, M., Bergenholtz, C., Bogers, M., Brasseur, T. M., Conradsen, M. L., ... & Xu, S. M. (2023). Examining Open Innovation in Science (OIS): what Open Innovation can and cannot offer the science of science. *Innovation*, 25(3), 221-235.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of management Review*, 14(4), 532-550.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25-32.
- Henriques, I. C., Sobreiro, V. A., & Kimura, H. (2018). Science and technology park: Future challenges. *Technology in Society*, 53, 144-160.
- Ivanova, I. (2024). From the Triple Helix Model of Innovations to the Quantitative Theory of Meaning. *Triple Helix*, 1(aop), 1-9.
- Narasimhalu, A. D. (2013). CUGAR: A model for open innovation in Science and Technology Parks. *World Technopolis Review*, 2(1), 10.
- Poetz, M., Beck, S., Grimpe, C., & Sauermann, H. (2024). Open Innovation in Science. In *The Oxford Handbook of Open Innovation* (pp. 455-472). Oxford University Press.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Sanabria-Z, J., Cruz-Sandoval, M., Moreno-Romo, A., Bosch-Gómez, S., & Ramírez-Montoya, M. S. (2024). Research foresight in bridging open science and open innovation: Overview based on the complex thinking paradigm. *International Journal of Innovation Studies*, 8(1), 59-75.

Silva, S. E., Venâncio, A., Silva, J. R., & Gonçalves, C. A. (2020). Open innovation in science parks: The role of public policies. *Technological Forecasting and Social Change*, 151, 119844.

Şimşek, K., & Yıldırım, N. (2016). Constraints to open innovation in science and technology parks. *Procedia-Social and Behavioral Sciences*, 235, 719-728.

Stake, R. E. (1995). The art of case study research. Califórnia, USA: Sage.

Yin, R. K. (2015). Estudo de Caso: Planejamento e métodos. Porto Alegre: Bookman.

Yin, R., (1994). Case study research: Design and methods (2nd ed.). Beverly Hills, CA: Sage Publishing.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Silvio Bitencourt da Silva	Brazil	UNISINOS	sibitencourt@unisinós.br
Gisele Spricigo	Brazil	UNISINOS	giseles@unisinós.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Innovation in healthcare from the perspective of technology maturity levels: a proposal for practical harmonization from the Brazilian institutional context.

TYPE: (a. original research)

TRACK: Collaborative Research and Development

PURPOSE: This study aims to critically address the challenge of applying the globally recognized Technology Readiness Level (TRL) scale within the Brazilian healthcare sector following Brazil's Ministry of Science, Technology, and Innovations (MCTI) institutionalization of the scale in 2022. Recognizing the complexities of healthcare technologies, this submission proposes an adapted and harmonized TRL framework that aligns with Brazil's innovation ecosystem's unique needs and dynamics. By integrating global standards with local healthcare requirements, our research seeks to facilitate the development of sustainable and impactful healthcare innovations. This work is particularly relevant in the context of the triple helix concept since the constructed methodology and the results of the practical harmonization of the TRL scale in healthcare will be presented with the expectation of contributing to the collaborative effort between academia, industry, and government to support and promote innovative solutions in the healthcare sector in Brazil.

DESIGN/METHODOLOGY/APPROACH: Utilizing a mixed-methods research approach, this study combines qualitative insights from literature reviews and quantitative data from case studies within the Brazilian healthcare sector. Through this comprehensive approach, the study aims to develop a nuanced understanding of technology maturity assessment and propose a framework adaptable to Brazil's healthcare innovation landscape and capable of addressing the identified challenges. The research methodology underscores the importance of a multidisciplinary approach to capture the full spectrum of insights necessary for effective TRL adaptation.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

FINDINGS OR EXPECTED OUTCOMES: Our research is poised to unveil significant insights into applying the TRL scale within Brazil's healthcare sector. Our results led to developing a validated TRL harmonization framework tailored to Brazil's distinctive healthcare challenges and opportunities. This framework aims to enhance the accuracy and relevance of technology maturity assessments and facilitate a more seamless transition of healthcare innovations from conceptualization to implementation. Additionally, the study emphasizes the importance of contextual adaptation in technology assessment, providing valuable guidance for stakeholders in Brazil and other emerging markets. The ultimate goal is to foster the development of more sustainable and impactful healthcare innovations through improved technology readiness evaluations.

ORIGINALITY/VALUE: This study represents a pioneering effort to adapt the TRL scale for healthcare innovations in the context of Brazil's healthcare sector and innovation ecosystem, especially following the scale's institutionalization by the MCTI. This research offers a practical framework for integrating global standards with local healthcare needs. The value of this work lies in its potential to significantly impact healthcare stakeholders in emerging markets by providing a more nuanced and practical approach to innovation assessment, thereby enhancing the impact and sustainability of healthcare technologies in a standardized assessment environment.

PRACTICAL/SOCIAL IMPLICATIONS: The practical implications of this research are profound, offering a pragmatic framework that aligns with Brazil's current healthcare innovation landscape and the recent institutionalization efforts by the MCTI. This adapted TRL framework promises to enable more accurate and contextually relevant assessments of healthcare technologies, potentially leading to significant advancements in patient care and health outcomes. From a social perspective, the study advocates for equitable progress in healthcare innovation by ensuring that new technologies are developed with a keen understanding of the diverse needs and challenges of various population groups. This work underscores the importance of inclusivity and accessibility in healthcare technology deployment, aiming to promote social equity and improve health access across Brazil.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This study lays the groundwork for

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

future research into its broader application across different sectors and its long-term effects on healthcare innovation success rates. Acknowledging its focus on the Brazilian healthcare sector as a limitation, the research calls for comparative studies to test the adapted TRL framework's applicability and effectiveness in different national and industry contexts. Such studies could provide valuable insights into the global applicability of the framework, offering a more comprehensive understanding of technology assessment practices in the wake of standardization efforts.

KEYWORDS (3-5): Technology Readiness Levels. Healthcare Innovation. Brazilian Healthcare. Technology Maturity Assessment. Emerging Markets in Healthcare.

REFERENCES:

Archibugi, D., & Filippetti, A. (2013). The Globalization of Intellectual Property Rights: Much Ado About Nothing? <http://dx.doi.org/10.2139/ssrn.2240365>

DoD, U. S. (2009). DEPARTMENT OF DEFENSE Technology Readiness Assessment (TRA) Deskbook. Retrieved March 3, 2024, from <https://apps.dtic.mil/sti/pdfs/ADA418881.pdf>.

Embrapa. (2018). Manual sobre o uso da escala TRL/MRL. SEG – Sistema Embrapa de Gestão. Retrieved March 3, 2024, from <https://cloud.cnpqc.embrapa.br/nap/files/2018/08/EscalaTRL-MRL-17Abr2018.pdf>.

Ferris, M. (2022). Life Sciences White Paper: Technology Readiness Levels. Plexus. Retrieved March 3, 2024, from <https://www.plexus.com/en-us/current/articles/technology-readiness-levels>.

Héder, M. (2017). From NASA to EU: the evolution of the TRL scale in Public Sector Innovation. *The Innovation Journal*, 22(2), 1-23.

International Organization for Standardization. (2013). Space systems - Definition of the Technology Readiness Levels (TRLs) and their assessment criteria. (ISO Standard No. 16290:2013). Retrieved March 3, 2024, from <https://www.iso.org/standard/56064.html>.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Mankins, J. C. (1995). Technology readiness levels: A white paper. Retrieved March 3, 2024, from <http://www.hq.nasa.gov/office/codeq/trl/trl.pdf>.

Martin, A. R., Carvalho, S. M. S., Cunha, J. C., & Lopes, A. C. C. (2020). Classificação dos Instrumentos de Captação de Recursos para Apoio à Inovação do Governo Federal na Escala de Prontidão Tecnológica (TRL). Cadernos de Prospecção, 13(1), 78-88.

Ribeiro, M., Frey, I., & Azevedo, P. (2022). Classificação das Patentes em Universidades Federais na Escala TRL (Technology Readiness Level): estudo de caso a partir da Norma ISO 16290:2013. Cadernos de Prospecção, 15(1).

Rocha, D., Araujo, G. L. V., & Melo, F. C. L. (2022). Maturity Assessment of Critical Technologies. Foresight and STI Governance. <https://dx.doi.org/10.17323/2500-2597.2022.4.71.81>

Salazar, G., & Russi-Vigoya, M. N. (2021). Technology readiness level as the foundation of human readiness level. Ergonomics in Design, 29(4), 25-29.

Walsh, S. T. (2004). Roadmapping a disruptive technology: A case study: The emerging microsystems and top-down nanosystems industry. Technological Forecasting and Social Change, 71(1-2), 161-185.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Thiago Negrão Chuba	Japan	Kyoto University	negraochuba.thiago.d45@kyoto-u.jp
Alexandre Guimarães Vasconcellos	Brazil	National Institute of Industrial Property (INPI)	alexguim@inpi.gov.br
Kelyane Silva	Brazil	Universidade Federal do Rio	kelyane@facc.ufrj.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

		de Janeiro (UFRJ)	
--	--	-------------------	--

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Economic impacts of digital health maturity: proposal of a model for measurement and analysis

TYPE: c. practical case / experience analysis

TRACK: 8. Collaborative Research and Development

PURPOSE: The research aims to propose a model for determining the incremental economic and financial impacts to be obtained by municipalities due to improvements performed that increase their level of digital health maturity, measured according to the scale adopted by the WHO.

Specifically, it consists of developing a method to systematically determine economic gains and losses incurred as a result of changes caused by the adoption of improvements in digital health, such as the implementation of a data exchange platform system based on the standards established by the Global Initiative on Digital Health (GIDH), from the WHO, the object of analysis. The platform under analysis address digitally the journey of breast cancer patients in the Municipality of Curitiba, located in the state of Paraná (Brazil).

Breast cancer is one of the main global causes of mortality and presented alarming numbers in 2023, with significant impacts in economic and social terms throughout the world. The lack of interoperability reduces the exchange of data between fragmented health systems, resulting in increased complexity of care, the occurrence of losses, duplication of costs and failures in the continuity of care.

Given this scenario, a pilot initiative aims to address the challenges of breast cancer through the creation of a web platform with an Artificial Intelligence center dedicated to regulation and management to promote efficient navigation of data between systems, directly benefiting the patient.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

The present study exemplifies the Triple Helix concept, as it consists of collaboration between the municipality of Curitiba, the pharmaceutical company financing the project, and the active participation of academia through the work of researchers.

The initiative seeks to build an open innovation platform, establishing networks for the exchange of knowledge as a "global good". The intention is to develop this model in the city of Curitiba (Paraná/Brazil), with prospects for replication on an international scale to begin in the city of Maputo (Mozambique), in line with WHO principles and the "Network of Networks" initiative.

Therefore, measuring the economic impacts of this kind of initiatives can help to justify its adoption and multiply their results.

DESIGN/METHODOLOGY/APPROACH: The research is a case study considering aspects related to the journey of breast cancer patients treated by the Brazilian Unified Health System (SUS) in the city of Curitiba/Paraná. This is an approach based on the analysis of primary and secondary documents and interviews with managers and professionals from the Municipal Health Department of Curitiba. The foundation is based on global concepts and techniques obtained predominantly from health management and public administration literature.

FINDINGS OR EXPECTED OUTCOMES: The study seeks to develop a systematic approach to highlight the economic and financial impacts resulting from the adoption of a digital data exchange platform between SUS health systems, in addition to demonstrating its feasibility through a real case study. The aim is to provide a structure that can be used by academics and users to evaluate the economic and financial effects of adopting technologies of this nature, complementing traditional analyzes focused on the patient's journey and aspects associated with health.

ORIGINALITY/VALUE: There are several studies and models aimed at evaluating the impacts of new health tools and technologies in the treatment of pathologies and the patient's journey, however, such studies do not usually consider the economic and financial impacts of adopting these solutions. The work

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

BRASIL. Lei nº 14.758 - Política Nacional de Prevenção e Controle do Câncer no âmbito do Sistema Único de Saúde (SUS). Diário Oficial da União, Brasília, DF, de 19 de dezembro de 2023. Disponível em: https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/lei/L14758.html. Acesso em: 02/02/2024

CASTELLS, Manuel. A Sociedade em Rede: A Era da Informação: Economia, Sociedade e Cultura. Editora Paz e Terra, 1996.

DONABEDIAN, A. (2003). An Introduction to Quality Assurance in Health Care- Edited by Rashid Bashshur. OXFORD UNIVERSITY PRESS- ISBN 0-19-515809, New York, 2003.

HILLS, M; MULLETT J; CARROLL S. (2007). Community-based participatory Action Research: transforming multidisciplinary practice in primary health care. Rev. Panam Salud Publica. 2007 Feb-Mar;21(2-3):125-35. DOI: 10.1590/s1020-49892007000200007. PMID: 17565799. (2007).

OBERMEYER, Ziad et al. Dissecting racial bias in an algorithm used to manage the health of populations. Science, v. 366, p. 447-453, 2019. DOI: 10.1126/science. aax2342.

OMS-Organização Mundial da Saúde (OMS). Monitoring and evaluating digital health interventions: a practical guide to conducting research and assessment. Genebra: World Health Organization, 2020. Licença: CC BY-NC-SA 3.0 IGO. (2016)

OMS- Organização Mundial da Saúde. ABNT Implementation Investment Guide (DIIG): Integrating Digital Interventions into Health Programmes. Genebra: OMS, 2020. Disponível em: <https://www.who.int/publications/i/item/9789240010567> (2020)

OMS- Organização Mundial da Saúde - Global strategy on digital health 2020-2025. Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO (2021)

OMS- Organização Mundial da Saúde. ABNT Implementation Investment Guide (DIIG): Integrating Digital Interventions into Health Programmes. Genebra: OMS, 2022. Disponível em:

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

is original and innovative in proposing a specific model to assist in the operationalization of a contemporary phenomenon: the process of digital transformation in public health along the lines established by the programs developed at the WHO.

PRACTICAL/SOCIAL IMPLICATIONS: The study proposes a comprehensive approach that encompasses the economic side of the triple Helix, in order to complement analyzes carried out by technicians (practioneers) and academics, in addition to producing inputs to support the formulation and evaluation of public policies and organizational strategies.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The project takes a structured partnership approach that promotes comprehensive collaborative management and aims not only at local results, but also at creating a sustainable and replicable model to address similar challenges in different parts of the world, however this research is focused on presenting results of the economic aspects and impacts of solving the lack of data interoperability, mainly addressing the scarcity of consistent information, supporting managers in decision making and maximizing resources that improve the breast cancer journey and continuity of care. Analysis of interfaces with therapies, procedures and medicines and their respective costs are also excluded and data will be collected from Curitiba that can be replicated in Mozambique.

KEYWORDS (3-5) 1) Interoperability in Healthcare, 2) Economic Analysis in Healthcare, 3) Digital Health, 4) Global Health, 5) Data Management

REFERENCES

ANDRADE et al.: Jornada do paciente com câncer de mama no município do Rio de Janeiro: uma avaliação sobre o itinerário do cuidado. Projeto de Pesquisa, SECRETARIA MUNICIPAL DE SAÚDE DO RIO DE JANEIRO - SMS/RJ, 2023

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

<https://www.who.int/publications/i/item/9789240056572> (2022)

ONG, W. L. et al. A Standard Set of Value-Based Patient-Centered Outcomes for Breast Cancer: The International Consortium for Health Outcomes Measurement (ICHOM) Initiative. JAMA Oncol., v. 3, n. 5, p. 677–685, 2017. DOI: 10.1001/jamaoncol.2016.4851 (2017).

PORTER M.E, Teisberg E. O. Redefining Health Care: Creating Value-Based Competition on Results. Harvard Business Press; 2006.

SAESEN, R., Lacombe, D. and Huys, I., Real-world data in oncology: a questionnaire-based analysis of the academic research landscape examining the policies and experiences of the cancer cooperative groups. ESMO open, 8(2), p.100878. (2023)

SMS -Secretaria Municipal da Saúde de Curitiba. Plano Municipal de Saúde e Programação Anual de Saúde. Disponível em:

<https://saude.curitiba.pr.gov.br/a-secretaria/plano-municipal-de-saude-e-programacao-anual-de-saude.html>.

Acesso em: 11/11/2023

SMS- Secretaria Municipal da Saúde de Curitiba. Saúde já 4.1 [livro eletrônico] / Beatriz Battistella Nadas; organização Raquel Ferraro Cubas, Antônio Dercy Silveira Filho, Ana Lúcia Camargo. -- Curitiba, PR: Secretaria Municipal da Saúde, 2023. Disponível em: <inserir aqui o link do PDF>. Acesso em: 02/02/2024

WORLD ECONOMIC FORUM; L.E.K. CONSULTING. Global Health and Healthcare Strategic Outlook. Janeiro de 2023.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Diogo Moreira Carneiro	Brazil	USP/FEA	diogo.carneiro@gmail

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

			.com
Neusa Andrade	Brazil	USP/POLI	neusa@agenciaweb.com.br
Carolina Carvalho Pereira Matos	Brazil	USP/POLI	carolinacarvalhopmatos@gmail.com
Esmeralda Hortência Eugênio	Moçambique	Faculdade de Medicina da Universidade Lúrio	esmeraldahortenciaeugenio@gmail.com
Raquel Acciarito Motta	Brazil	Prisma Educação Continuada e Aprendizagem Profissional Ltda	raquel@prismaconsultoriaemsaude.com.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Fostering Innovation within Bounds: Freedom of Contract and Principles of Public Administration in Research and Development Partnerships

TYPE: Practical experience analysis

TRACK: Collaborative Research and Development

DESIGN/METHODOLOGY/APPROACH: The paper proposes a non-doctrinal, qualitative research methodology to analyze the dynamics between freedom of contract and principles of public administration in the drafting process of contractual clauses for Research and Development (R&D) partnerships at the University of São Paulo.

FINDINGS OR EXPECTED OUTCOMES: In Brazil, the National Innovation System is regulated by Law No. 10.973 of December 2, 2004 (“Innovation Law”), as amended up to Law No. 13.243 of January 11, 2016. The Innovation Law introduced incentives for the collaboration between universities, industrial partners and the government, following the Triple Helix Model. Art. 9 of the Innovation Law entitles scientific, technological and innovation institutions, such as public administration entities whose institutional mission includes basic or applied scientific and technological research, to enter into agreements with private institutions in order to execute joint research activities and to collaboratively develop technological products, services or processes. As further regulated by the Federal Decree no. 9.283 of February 7, 2018, these joint activities are concluded through R&D partnership agreements, which are preceded by direct negotiations between the parties, without the requirement of structured bidding processes. Thus, freedom of contract is privileged, ensuring the necessary flexibility for partnerships that might range from specific projects to strategic alliances. However, general principles of public administration, *e.g.*, strict legality and transparency requirements, must still be observed. Consequently, the problem of fostering innovation between the constraints to which the Public

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Administration is bound arises.

ORIGINALITY/VALUE: At the University of São Paulo Attorney's Office, practical experiences of drafting contractual clauses for R&D partnerships concretely illustrate how public officers ensure the necessary flexibility while adhering to the public administration principles' requirements in partnerships with different levels of complexity. For partnerships with a more restrictive scope, standard contractual clauses allow for the simplification of the drafting and approval processes, while warranting legal certainty and ensuring best practices in several areas, from research integrity to data protection, are met. Intellectual property conditions are used to safeguard the returns of eventual scientific and technological inventions, making sure the public-private collaboration is not detrimental to the public administration. Additionally, confidentiality requirements allow parties to share the results of the collaboration, providing the dissemination of the results to the greater community, while protecting specific sensitive information which, if publicized, would harm the private partner or the university. Finally, in projects with more extensive scopes, such as strategic alliances, governance mechanisms are established to adequately coordinate the different axis of the Triple Helix Model, promoting the relational element intrinsic to continuous cooperation. Thus, these practices foster scientific, technological and innovation initiatives based in the interaction between academia, industry, and government, at the University of São Paulo.

PRACTICAL/SOCIAL IMPLICATIONS: The exploration into the Brazilian National Innovation System and the University of São Paulo's experience analysis unveils practical implications for the structuring of R&D partnerships under the dual mandates of freedom of contract and the principles of public administration. The balancing act between providing the necessary flexibility for innovation while strictly adhering to requirements of transparency and legality is instrumental in fostering an environment conducive to scientific and technological advancement. The elucidation of these practices suggests mechanisms to navigate the complexities of public-private collaborations more effectively.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The examination is limited by its focus on the Brazilian legal framework and the practical experiences within a singular institutional context—the University of São Paulo. Consequently, the applicability of findings to other public institutions or in

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

varying legal jurisdictions requires further validation. Future research could extend this analysis by incorporating comparative studies across different public institutions within Brazil or similar regional innovation systems internationally. Additionally, investigation into the perspectives of private sector partners involved in R&D collaborations could offer a more rounded view of the challenges and opportunities presented by Brazil's innovation framework.

KEYWORDS (3-5): innovation systems; contractual instruments; research and development partnerships; public-private collaborations

REFERENCES

Decreto No. 9.283 de 7 de Fevereiro de 2018, D.O.U. de 8 de Fevereiro de 2018 (Brazil), available at https://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2018/Decreto/D9283.htm

Dzisah, J., & Etzkowitz, H. (2011). The age of knowledge: The dynamics of universities, knowledge and society (Vol. 37). Brill.

Lei No. 10.973 de 2 de Dezembro de 2004, (com alterações pela Lei No. 13.243 de 11 de Janeiro de 2016), D.O.U. de 3 de Dezembro de 2004 (Brazil), available at https://www.planalto.gov.br/ccivil_03/_ato2004-2006/2004/lei/110.973.htm

Macneil, I. R. (1977). Contracts: Adjustment of long-term economic relations under classical, neoclassical, and relational contract law. *Nw. UL Rev.*, 72, 854.

Medauar, O. (2023). *Direito Administrativo Moderno*. 23rd. ed. São Paulo: Fórum.

Medeiros, J. C. C. (2020). Novo arranjo para inovação nas instituições científicas, tecnológicas e de inovação (ICT): ambiente temático catalisador de inovação (ATCI) e a experiência da UFMG.

Teece, D. J. (1992). Competition, cooperation, and innovation: Organizational arrangements for regimes of rapid technological progress. *Journal of economic behavior & organization*, 18(1), 1-25.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Isadora Valadares Assunção	Brazil	University of São Paulo	isadoravaladares@usp .br
Rafael Seco Saravalli	Brazil	University of São Paulo	rafaelsaravalli@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: PROFESSIONAL CERTIFICATION: THE NECESSARY SKILLS IN MEDIATING TECHNOLOGY TRANSFER AGREEMENTS

TYPE (a. original research, b. research Design or c. practical case / experience analysis):

a. original research

TRACK: Technology Transfer and Innovation

PURPOSE: This article aims to identify and describe the necessary competencies required of professionals involved in mediating the processes of transferring knowledge and technologies developed in academia to the market, with a view to their certification in accordance with the Registered Technology Transfer Professionals (RTTP) framework. The choice of this methodology is based on the fact that it is the standard adopted by the Alliance for Technology Transfer Professionals (ATTP), a global alliance whose purpose is, among others, to certify professionals in academic technology transfer according to an internationally recognized standard. Additionally, the aim is to validate the theoretical foundation based on a literature review through the practical application of the methodology.

DESIGN/METHODOLOGY/APPROACH: The methodological procedure combined a literature review in the Scopus database, searching for terms such as "technology transfer", "knowledge transfer", "collaborations", "intermediaries", "commercialization", "university-industry collaboration", etc., where the competencies mentioned by leading authors regarding technology transfer mediation were identified. In a second phase, certifications adopted by associations that are part of the ATTP, such as ASTP (European Union), AUTM (United States), KCA (Australia), PraxisAuril (United Kingdom), RedTransfer (Spain), among others, were consulted, identifying the guidelines of the global Registered Technology Transfer Professional (RTTP) certification, obtained through regulations and documents disseminated by the ATTP (global alliance), as the main organization governing these standards internationally. After

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

identifying the competencies related to technology transfer, both in scientific sources and in the professional bases of certifying entities, the aim was to identify the alignment between the competencies described in the theoretical framework and their technical/professional application.

FINDINGS OR EXPECTED OUTCOMES: The main key skills for innovation intermediaries have been identified, including the ability to articulate partners with different objectives (Sultana N., Turkina E., 2023), commercial vision (Janssen, W., Bouwman, H., van Buuren, R. and Haaker, T., 2014), entrepreneurial culture (Barbara Aquilani, Tindara Abbate & Anna Codini, 2017), complex negotiation skills (Rossoni, A.L., de Vasconcellos, E.P.G. & de Castilho Rossoni, R.L, 2023), problem-solving ability (Jeremy Howells, 2006), technical understanding, knowledge in intellectual property (Janssen, W., Bouwman, H., van Buuren, R. and Haaker, T., 2014), among others. Building key skills is crucial in forming teams that will work in technology transfer offices, in order to generate greater proactivity in collaboration and innovation, with strong social and communication skills and complementary technical knowledge (Canhoto, 2016).

ORIGINALITY/VALUE: By providing a concrete outcome regarding the compatibility of what the literature identifies as necessary competencies for innovation intermediaries in technology transfer and the characteristics addressed in certifying institutions, the article will contribute to the development of relationships between universities and businesses, serving as a basis for future certification programs for technology transfer professionals. This will provide them with scientific validations of the professional enhancement process, enabling them to operate in any innovation ecosystem.

PRACTICAL/SOCIAL IMPLICATIONS: The results of this study impact the development and evaluation of training, recruitment, and certification programs for innovation intermediaries, associating the building of professional competencies with solid scientific foundations. This can result in positive social and economic impacts, with greater effectiveness in technology transfer.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Further explanatory research is recommended on the effectiveness and outcomes of the competencies identified in specific technology

transfer contexts. Additionally, it is important to investigate the challenges and limitations faced by innovation intermediaries in practice.

KEYWORDS (3-5): Technology Transfer; Innovation Intermediaries; Technology Transfer Consultants; Technology Transfer Mediation Skills; Competencies.

REFERENCES

Sultana N., Turkina E. (2023). Collaboration for Sustainable Innovation Ecosystem: The Role of Intermediaries. Sustainability (Switzerland), 15 (10), art. no. 7754. <https://doi.org/10.3390/su15107754>.

Janssen, W., Bouwman, H., van Buuren, R. and Haaker, T. (2014). "An organizational competence model for innovation intermediaries", European Journal of Innovation Management, Vol. 17 No. 1, pp. 2-24. <https://doi.org/10.1108/EJIM-09-2012-0087>.

Dziurski, Patryk & Sopińska, Agnieszka. (2020). Does industry matter? Drivers and barriers for open innovation in high-tech and non-high-tech industries - Evidence from Poland. International Journal of Management and Economics. 56. 307-323. <https://doi.org/10.2478/ijme-2020-0024>.

Barbara Aquilani, Tindara Abbate & Anna Codini (2017). Overcoming cultural barriers in open innovation processes through intermediaries: a theoretical framework, Knowledge Management Research & Practice, 15:3, 447-459. <https://doi.org/10.1057/s41275-017-0067-5>.

Rossoni, A.L., de Vasconcellos, E.P.G. & de Castilho Rossoni, R.L (2023). Barriers and facilitators of university-industry collaboration for research, development and innovation: a systematic review. Manag Rev Q (2023). <https://doi.org/10.1007/s11301-023-00349-1>.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Janssen, W., Bouwman, H., van Buuren, R. and Haaker, T. (2014), "An organizational competence model for innovation intermediaries", *European Journal of Innovation Management*, Vol. 17 No. 1, pp. 2-24.
<https://doi.org/10.1108/EJIM-09-2012-0087>.

Jeremy Howells. (2006). Intermediation and the role of intermediaries in innovation, *Research Policy*, Volume 35, Issue 5, 2006, Pages 715-728, ISSN 0048-7333, <https://doi.org/10.1016/j.respol.2006.03.005>.

ATTP. (2024). Padrão Internacional para avaliar a Competência e a Experiência Profissional de profissionais que trabalham com Intercâmbio de Conhecimento/Transferência de Conhecimento/Transferência de Tecnologia. <https://attp.global/application-process/criteria/>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Michael Anderson Rodrigues Soares	Brazil	Universidade Federal do Piauí	anderson.soares@ufpi.edu.br
Helano Diogenes Pinheiro	Brazil	Universidade Estadual do Piauí	helanodp22@gmail.com
Marli Elizabeth Ritter dos Santos	Brazil	Conselho Consultivo Fórum Nacional de Gestores de Inovação - Fortec	betryritter1953@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Optimizing dental treatments through digital workflow and innovative material use

TYPE c. practical case

TRACK: (Indicate one Track described in the Call for Abstracts, pages 4 and 5: <https://triplehelixconferencebrazil.com/wp-content/uploads/2024/02/call-for-abstracts-THC2024-v20240228.pdf>)
Industry-academia research collaboration

PURPOSE: To explore innovative digital workflow methodologies and materials that can reduce the waiting time for dental restorative treatments in Brazilians public dental institutions, along with fewer procedures stages, reduced material consumption, and reduced clinical time. Consequently, this approach seeks to enhance the patients' quality of life by providing timely and efficient dental care.

DESIGN/METHODOLOGY/APPROACH: Upon evaluating clinical cases of patients with one or more fractured teeth, occlusal disharmony, and those unable to receive dental implants due to financial or physiological reasons, it is often observed that many of these individuals experience compromised function (biting/chewing), and aesthetics concerns, thereby impacting their quality of life significantly.

After rigorous clinical analysis and the undertaking of complementary exams, such as photographs and radiographs, in the same treatment session, it is possible to preserve many of these dental remnants. This approach effectively prevents the loss of structure, thereby avoiding the need for more complex treatments. By collecting data, intraoral scanning is performed to create three-dimensional (3D) models of the dental arches. The digital dental workflow allows the application of restorative techniques with fewer steps, reduction of clinical time, and material consumption. The method's efficiency not only increases the number of patients treated but also significantly improves their quality of life.

The deployment of polymethylmethacrylate (PMMA) blocks (Digital Solution, Huge Dental). emerges as a groundbreaking solution for both individual restorations and partial or total removable prostheses.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Distinguished by their durability, resistance to biting and chewing forces, and superior aesthetics, PMMA blocks exhibit a pivotal role in sustaining oral health, offering exceptional aesthetic and functional outcomes.

FINDINGS OR EXPECTED OUTCOMES: The adoption of innovative digital workflow methodologies and advanced materials in Brazilian Dental Schools is anticipated to streamline the dental restoration process, resulting in significantly fewer procedural stages (Figure 1). This approach aims to potentially enhance patient satisfaction and well-being. Furthermore, the use of PMMA material is expected to lead to more durable restorations for compromised teeth, provide a highly aesthetic result, and offer long-term improvements in patients' oral health.



Figure 1. The procedures steps for obtaining a prosthesis through the conventional method (left) and the digital workflow (right). The digital workflow tends to be faster and more efficient, reducing the number of patient visits to the clinic and increasing the precision of the final prosthesis.

ORIGINALITY/VALUE: This study presents a novel approach in dental treatment by integrating digital workflows with the application of PMMA blocks, enhancing the efficiency and effectiveness of dental restorative processes. The use of these innovative materials and methodologies showcases a significant leap in dental practice.

PRACTICAL/SOCIAL IMPLICATIONS: The synergy between universities and technology companies in advancing and implementing digital dentistry promises a significant improvement in dental education. This collaboration can foster the inclusion of diverse treatment options in the curriculum, equipping future dentists with a comprehensive and inclusive perspective on various treatment options. Furthermore, this education empowers these emerging dentists to offer deeper insights into these alternatives, ensuring that they can deliver the most suitable and efficacious treatment solutions tailored to the specific needs according to the region they will serve.

Additionally, the waiting period for an initial appointment at Brazilian institutions can span up to approximately 5 years. In this scenario, these technologies in the dental field could enhance efficiency, promote sustainability, and lead to cost reductions.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Future research should focus on long-term clinical studies to evaluate the durability of PMMA materials used in digital workflows and the resultant improvement in the quality of life of the patients served.

KEYWORDS (3-5) Digital Dentistry; Dental Materials; PMMA Blocks; Dental Education

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

REFERENCE

Huge Dental. (n.d.). Digital Solution. PMMA Blocks. Retrieved from
<https://www.hugedental.com/products/pmma-blocks/>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Bruna Tonin	Brazil	Ribeirao Preto Dental School, University of São Paulo	bruna.tonin@usp.br
Regina Guenka Palma-Dibb	Brazil	Ribeirao Preto Dental School, University of São Paulo	rgpalma@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: The Emergence of the Entrepreneurial University in Agroindustrial Regions: The Case of the State of Mato Grosso, Brazil.

TYPE: original research

TRACK: 8 Collaborative Research and Development / Industry-academia research collaborations

PURPOSE: Universities worldwide face increasing government, companies, and societal demands. To meet these demands, universities have adjusted their focus on research and teaching, sought new funding sources, and updated their internal policies. Knowledge capitalization involves connecting universities, governments, and the productive sector (Triple Helix). This research aims to identify and analyze the driving and limiting factors in transforming universities into entrepreneurial institutions in a region dominated by the agroindustrial sector. The specific objectives of this research include 1) Analyzing the drivers of the creation and growth of entrepreneurial universities, 2) Evaluating the influence of the university community on entrepreneurship, 3) Exploring the impact of resources on entrepreneurial universities' missions, and 4) Investigating the challenges and barriers faced by universities in implementing entrepreneurial activities and how they can be overcome.

DESIGN/METHODOLOGY/APPROACH: A systematic literature review was conducted using the PRISMA method across four publication databases: Web of Science, Scopus, Scielo, and Spell. The review revealed 932 articles on entrepreneurial universities published in the last five years, out of which 632 articles were selected and treated in Endnote. Guerrero and Urbano (2012) proposed a framework as the research framework, supplemented by other factors, which considered the internal and external environments, the exploration of knowledge, and the impact of universities' entrepreneurial activities. Based on this framework, a questionnaire was created with 63 statements to be evaluated using a Likert ladder. Open research specialists at Research Gate validated the questionnaire. Then, they distributed it to 3,328 faculty members from three public universities in the State: Federal University of Mato Grosso, Federal University and Rondonópolis, and State University of Mato Grosso. Two hundred eighty-five questionnaires were received and treated with the Partial Least Squares - Structural Equation Modeling (PLS-SEM) technique using SmartPLS software.

FINDINGS OR EXPECTED OUTCOMES: The research is still ongoing, but initial results show that:

- The concept of an entrepreneurial university is little known and disseminated among research professors, despite them carrying out university-company interaction activities,
- Interaction with the productive sector is well regarded in most areas of knowledge, but there are still ideological barriers demanding a cultural change at the university,
- Universities have not incorporated innovation and entrepreneurship into their agenda yet, except the Federal University of Rondonópolis, which is reflected in barriers to university-company interaction,
- The perception is that agro-industrial companies in the region seek technology in equipment but carry out

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

little research, at most with the Brazilian Agricultural Research Corporation (Embrapa).

- The perception is that there are different demands from small and medium-sized farmers concerning those of large agro-industrial companies, but that both are open to interaction with the university,
- Local governments need to do more to support innovation, entrepreneurship, and university-business interaction.

ORIGINALITY/VALUE: The study is original in the sense that it studies the entrepreneurial behavior of high education institutions in a less innovative region of a less developed economy.

PRACTICAL/SOCIAL IMPLICATIONS: The analysis of three academic institutions has revealed that a Triple Helix type III interaction has not yet been established. This type of interaction involves collaboration between the university, government, and industry in hybrid and consensus spaces. Currently, the actors act separately without coordination and with limited interactions, which is a laissez-faire type of interaction. The region has the sector's highest level of technological development, mainly through purchasing equipment and inputs from Embrapa. However, considering the region's economic development, which is the country's leading producer and exporter of grains and proteins, it is necessary for academia to take a more active role in supporting the productive sector in solving technological problems and generating socioeconomic development. It is recommended that universities modernize their legal-institutional framework to facilitate interactions with the productive sector. What can be done through institutional innovation policies and updating rules for carrying out projects and providing services to the private sector. Universities could also signal to the government to take an active role in boosting interaction.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The results showed that the entrepreneurial university is still a construction in its initial phase and that there are driving factors, but barriers still limit broader university-industry linkage. To achieve this, regulatory and cultural changes need to advance. The study is still ongoing, and interviews will be carried out with academic managers to allow a better interpretation of the results obtained.

KEYWORDS (3-5): entrepreneurial university; agro-industrial region; Mato Grosso.

REFERENCES:

- APARECIDO-TOMAZ, P.; FISCHER, B.; MEISSNER, D.; RÜCKER-SCHAEFFER, P. The Dynamics of University-Industry Interactions in Peripheral Contexts: Evidence from Brazil. **Foresight and STI Governance**, 16, n. 4, p. 59-69, 2022. Article.
- BUDYLDINA, N. Entrepreneurial universities and regional contribution. **International entrepreneurship and management journal**, 14, n. 2, p. 265-277, 2018.
- ETZKOWITZ, H. Anatomy of the entrepreneurial university. **Social science information**, 52, n. 3, p. 486-511, 2013.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

GARCÍA-HURTADO, D.; DEVECE, C.; ZEGARRA-SALDAÑA, P. E.; CRISANTO-PANTOJA, M. Ambidexterity in entrepreneurial universities and performance measurement systems. A literature review. **International Entrepreneurship and Management Journal**, 2022. Article.

GIBSON, D. V.; FOSS, L. Developing the entrepreneurial university: Architecture and institutional theory. **World Technopolis Review**, 6, n. 1, p. 3-1, 2017.

GUERRERO, M.; CUNNINGHAM, J. A.; URBANO, D. Economic impact of entrepreneurial universities' activities: An exploratory study of the United Kingdom. **Research Policy**, 44, n. 3, p. 748-764, 2015.

GUERRERO, M.; URBANO, D. The development of an entrepreneurial university. **The journal of technology transfer**, 37, p. 43-74, 2012.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Evander Novaes Moreira	BRASIL	Federal University of Mato Grosso (UFMT)	evandermoreira.ufmt@gmail.com
Danielle Rodrigues Dos Santos Ávila	BRASIL	Federal University of Rondonópolis (UFMT)	danielle.avila@ufr.edu.br
Edilane Dos Reis Carraro	BRASIL	Fluminense Federal University (UFF)	edilaneccarraro4@gmail.com
Marcelo Amaral*	BRASIL	Fluminense Federal University (UFF)	marceloamaral@id.uff.br

* Submission Contact

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Scientific Partnerships and Knowledge Transfer on DNA Recombinant

TYPE: (a. original research)

TRACK: 8

PURPOSE: This article aims to map scientific-enterprises partnerships producing expertise on animal-to-recombinant transition in the European Union. This includes gradually implementing recombinant technology into biosensing devices and the knowledge-sharing mechanisms that make it possible. This requires an approach based on analysing publications, patents and consortium configurations to understand how different research centres interact with enterprises to turn scientific work into commercialized products (2000-2023). Various features might impact the dynamics of knowledge sharing and partnerships. The role of regional clusters, the attempts to apply new science management models and the historical synergies between institutions.

This work is part of the EU-funded Horizon project BioAssembler, which establishes a partnership between natural and social sciences to build a coherent body of work about the feasibility of innovating the biosensors field through animal-free recombinant.

DESIGN/METHODOLOGY/APPROACH: The publications data will be collected from WoS and Scopus to proceed to a metadata bibliometric analysis of the literature on animal-to-recombinant transformation. The patent data are based on searches related to keywords on Recombinant domains in databases such as Google Patents and the European Patent Office. The framing of the BioAssembler project within the Horizon programme explains the focus on the EU patents. The awareness of other geographical patents and scientific consortiums will be considered a comparative frame to the EU scientific landscape. However, the core patent market to be tracked in this deliverable will be the EU patents, which are further contextualised by the political setting of the European Union on Recombinant innovation and GMOs. The consortium research is supported by delving into a literature review, document analysis, and organisational websites (STIP, EU Horizon), which allows for categorising information on projects funded in the EU.

After the data collection stage, the three databases are merged to depict the patterns and links common to all three dimensions. The nodes of the networks display the metadata of publications, patents, and consortiums, while the edges portray the collaboration dynamics. From there, the mapping display will

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

allow for measuring the dispersion between central institutions and more peripheral entities and understanding the mechanisms through which the knowledge flows from the core to the outskirts of the network. Applying algorithms in network software such as VosViewer, Graphi and Vortex results in output in the form of quantitative data and the translation of those data into visual mapping.

The methodology involves modelling a structural social network encompassing knowledge transfer between universities and industries/enterprises. Data for this study was collected by scrutinising significant projects funded by international organisations, analysing co-authorship dynamics, examining authors' affiliations in publications within the field, and investigating collaborative efforts in patent creation.

FINDINGS OR EXPECTED OUTCOMES: The EU's Innovation Agenda is becoming more prone to high-risk, high-reward research projects. The start-ups and associated research centres should take this opportunity to value their intellectual assets and explore the opportunities to advance the recombinant scientific field further while envisioning the possibilities for commercialisation. This also requires the researchers to be bold and creative in finding groundbreaking innovative products that turn the EU investment into competitive products in the global market allowed by the push of SMEs. Biotech SMEs might conquer something rarely achievable within the EU: combining exceptional advances in a multidisciplinary setting to tackle social and environmental sustainability issues while supporting a profitable business model without animal experiences.

ORIGINALITY/VALUE: There is a lack of literature on the innovative and technological features that led to the development of animal-free recombinants. The sudden growth of this scientific area, with the concerns of environmental sustainability and ethical dimensions, led to the need to track how knowledge flows inside the field of animal-to-recombinant transformation. Therefore, this article is one of the pioneering research studies on the social and economic analysis of the recombinant technology developments to be integrated into biosensing devices in the EU. This implies a novelty to the academic field, filling a gap in addressing the knowledge flow between institutions and a policy output to help inform the future synergies to be built between the collaborative entities.

PRACTICAL/SOCIAL IMPLICATIONS: Biosensors have become indispensable devices in our daily lives, from wearable devices to smartphones that citizens carry in their pockets. The BioAssembler Horizon project has sought sustainable solutions to build multiplex biosensors through DNA recombinant technology. The project's research until now shows that scientific partnerships with industries and enterprises have been fundamental to the development of innovation research on biosensors and the animal-to-recombinant transformation associated with it. Achieving these goals might provide a technological advantage to the European Union market, being a step forward to implement the innovation towards the SDGs and the European Green Deal.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This contribution to the literature must

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

acknowledge and be aware of the limitations of this methodology. The choice of words to filter the metadata from the publications and patent networks influences the final results. The chosen words have been selected to refer to direct observation and participation in formal and informal meetings of BioAssembler. The team has experts on animal-to-recombinant engineering, which helped in interviews to draw the big picture of the field and validate the word choice. A different team could have chosen other words that could slightly change the final results and respective mapping.

The mechanisms used to move knowledge from one sector to another are crucial to comprehending how science develops with economic, social and political impacts on biosensing innovation. The comprehension of how those factors interact at a micro level to tackle bottlenecks in the work organization between the natural sciences researchers in different geographical settings, the SME's commercialisation interest and other stakeholders who might participate in the scientific or patenting process.

KEYWORDS (3-5)

Animal-to-Recombinant Transition; Multiplex Biosensors; Research-Enterprises Collaborations; Patents and Publications; EU Innovation

REFERENCES

Ardito, L. (2018). Markets for university inventions: the role of patents' underlying knowledge in university-to-industry technology commercialisation. *International Journal of Technology Management*, 78(1-2), 9-27.

Coghlan, C., Labrecque, J., Ma, Y., & Dube, L. (2020). A biological adaptability approach to innovation for small and medium enterprises (SMEs): Strategic insights from and for health-promoting agri-food innovation. *Sustainability*, 12(10), 4227.

Veletanlić, E., & Sá, C. (2019). Government programs for university–industry partnerships: Logics, design, and implications for academic science. *Research Evaluation*, 28(2), 109-122.

Ulhøi, J., Neergaard, H., & Bjerregaard, T. (2012). Beyond unidirectional knowledge transfer: An empirical study of trust-based university–industry research and technology collaboration. *The International Journal of Entrepreneurship and Innovation*, 13(4), 287-299..

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Bernardo Valente	Portugal	Centre for Social	bernardovalente@ces.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

		Studies, University of Coimbra	uc
Rita Campos	Portugal	Centre for Social Studies, University of Coimbra	ritacampos@ces.uc.pt

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (minimum 500 words, maximum 1000 words)

TITLE: Interplay between ecosystem types: review and agenda for future research

TYPE: Original Research

TRACK: Collaborative Research and Development

PURPOSE: Ecosystem Management (EM) has emerged as a promising field to address interdependence and collective value creation (Gomes et al., 2021). With the progressive advancement of the field, it is possible not only to understand what the construct represents, but also to differentiate the types of ecosystems (business ecosystems, innovation ecosystems, entrepreneurship ecosystems, and knowledge ecosystems) (Autio & Thomas, 2022; Cobben et al., 2022; Scaringella & Radziwon, 2018; Thomas & Autio, 2020; Valkokari, 2015) and to know in which contexts each of them adds theoretical value. With this clarity, researchers can take a step further and discover how different types of ecosystems intersect. Thus, our purpose is to understand how the interaction between knowledge and innovation ecosystems has been investigated in the Management and Business literature.

DESIGN/METHODOLOGY/APPROACH: We conducted a systematic literature review (SLR) following the procedures performed by previous studies (Denyer & Tranfield, 2009; Paul & Criado, 2020; Petticrew & Roberts, 2006; Snyder, 2019) and analyzed the results based on content analysis (Gaur & Kumar, 2018).

FINDINGS OR EXPECTED OUTCOMES: The SLR describes the current state of this research stream and proposes a research agenda capable of driving research on the intersection between knowledge and innovation ecosystems.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

ORIGINALITY/VALUE: Our study expands the limited literature on the intersection between types of ecosystems. This research stream requires urgent attention, as the complexity of certain phenomena demands that different ecosystems be addressed in an integrated manner (Autio & Thomas, 2022). Few scholars have investigated types of ecosystems jointly (Ghazinoory et al., 2021), and there still remains a lack of a comprehensive understanding of how types of ecosystems can establish relationships and how this dynamic process occurs over time (Ancona et al., 2023). In response to the need to deepen the limited literature on the interaction between knowledge and innovation ecosystems (Baldwin et al., 2024; Järvi et al., 2018), we constructed a conceptual model developed based on previous research to delineate the central elements of the intersection between these ecosystems. Finally, we argue that linking these ecosystems promotes the nascent conversation between the fields of Ecosystem Management and University-Industry Collaboration (UIC).

PRACTICAL/SOCIAL IMPLICATIONS: The proposed conceptual model illustrates how ecosystem managers can address the benefits of knowledge transfer between universities and industries by emphasizing the emergence and development of knowledge and innovation ecosystems.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The proposed research agenda identifies potential research streams to guide investigations on how types of ecosystems can interact. Our results are preliminary and consider only two types of ecosystems (knowledge and innovation).

KEYWORDS: Ecosystem Management; Innovation Ecosystem; Knowledge Ecosystem; University-Industry Collaboration; Knowledge Transfer.

REFERENCES

- Ancona, A., Ceci, G., Cobben, D., Kirkels, Y., & Wetering, R. van de. (2023). *Unveiling ecosystem dynamics: bridging gaps between Entrepreneurial and Innovation Ecosystems* (p. 1). R&D Management Conference.
- Autio, E., & Thomas, L. D. W. (2022). Researching ecosystems in innovation contexts. *Innovation &*

Management Review, 19(1), 12–25. <https://doi.org/10.1108/INMR-08-2021-0151>

- Baldwin, C. Y., Bogers, M. L. A. M., Kapoor, R., & West, J. (2024). Focusing the ecosystem lens on innovation studies. *Research Policy*, 53(3), 104949. <https://doi.org/10.1016/j.respol.2023.104949>
- Cobben, D., Ooms, W., Roijackers, N., & Radziwon, A. (2022). Ecosystem types: A systematic review on boundaries and goals. *Journal of Business Research*, 142, 138–164. <https://doi.org/10.1016/j.jbusres.2021.12.046>
- Denyer, D., & Tranfield, D. (2009). Producing a systematic review. In D. Buchanan (Ed.), *The Sage Handbook of Organizational Research Methods* (pp. 671–689). SAGE.
- Ghazinoory, S., Phillips, F., Afshari-Mofrad, M., & Bigdelou, N. (2021). Innovation lives in ecotones, not ecosystems. *Journal of Business Research*, 135, 572–580. <https://doi.org/10.1016/j.jbusres.2021.06.067>
- Gomes, L. A. de V., Chaparro, X. A. F., Facin, A. F. F., & Borini, F. M. (2021). Ecosystem management: Past achievements and future promises. *Technological Forecasting and Social Change*, 171(November 2020), 120950. <https://doi.org/10.1016/j.techfore.2021.120950>
- Järvi, K., Almpanopoulou, A., & Ritala, P. (2018). Organization of knowledge ecosystems: Prefigurative and partial forms. *Research Policy*, 47(8), 1523–1537. <https://doi.org/10.1016/j.respol.2018.05.007>
- Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know? *International Business Review*, 29(4), 101717. <https://doi.org/10.1016/j.ibusrev.2020.101717>
- Petticrew, M., & Roberts, H. (2006). *Systematic Reviews in the Social Sciences* (M. Petticrew & H. Roberts (eds.)). Blackwell Publishing Ltd. <https://doi.org/10.1002/9780470754887>
- Scaringella, L., & Radziwon, A. (2018). Innovation, entrepreneurial, knowledge, and business ecosystems: Old wine in new bottles? *Technological Forecasting and Social Change*, 136, 59–87. <https://doi.org/10.1016/j.techfore.2017.09.023>
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of*

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Business Research, 104, 333–339. <https://doi.org/10.1016/j.jbusres.2019.07.039>

Thomas, L. D. W., & Autio, E. (2020). Innovation Ecosystems in Management: An Organizing Typology. In *Oxford Research Encyclopedia of Business and Management* (Issue May). Oxford University Press. <https://doi.org/10.1093/acrefore/9780190224851.013.203>

Valkokari, K. (2015). Business, Innovation, and Knowledge Ecosystems: How They Differ and How to Survive and Thrive within Them. *Technology Innovation Management Review*, 5(8), 17–24. <https://doi.org/10.22215/timreview/919>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Diogo Barbosa Leite	Brazil	ESPM	diogo.b1@hotmail.com
Sílvia Luís de Vasconcellos	Brazil	ESPM	silvio.vasconcellos@espm.br

XXII Triple Helix Conference – 2024

TITLE: Intermediary Management Models for Technology Transfer

TYPE (a. original research)

TRACK: 8. Collaborative Research and Development

PURPOSE: Technology transfer (TT) between universities and companies is a field of notable interest, given its influence on economic growth and technological development (Audretsch et al., 2014). Modern universities play a crucial role not only in education and research but also in applying knowledge for the benefit of society (Etzkowitz, 2003). In this context, TT intermediaries, such as technology transfer offices (TTOs) and research centers, play a crucial role in bridging the gap between academia and industry (Battistella et al., 2016).

Despite the attention devoted to analyzing TT intermediaries, the literature is scarce in providing evidence addressing the integration between different types of intermediaries. The encouragement of creating different types of intermediaries within the university has not been accompanied by an effort to combine a joint action plan among them. Watkins et al. (2015) highlight that the relevance of intermediaries in developing countries is of utmost importance; however, they face obstacles due to the lack of coordination among institutions such as intermediaries, universities, and companies.

DESIGN/METHODOLOGY/APPROACH: This study adopts a qualitative approach based on a case study to analyze the management of TT in organizational units that serve as TT intermediaries at USP. Primary data collection was conducted through 5 in-depth semi-structured interviews with research center coordinators and university TTO staff. We adopted content analysis technique to interpret the results aiming to identify management practices, gaps, and improvement opportunities to propose an integrated management model for TT intermediaries at universities.

FINDINGS OR EXPECTED OUTCOMES: The analysis of the results reveals that the research centers linked to USP observe various aspects that influence the interaction with companies, as well as significant barriers that may compromise this collaboration. Although there are frequent visits from companies to the research centers, indicating an increase in the intensity of these contacts, the absence of a structured format for TT means that it does

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

not have the expected effectiveness.

Furthermore, the lack of a well-defined strategy for exposing patents to the market was identified as a weakness. Although patents are generated, there is often no clear plan to present them to interested companies, making it difficult to commercialize the technologies developed in the research centers. Additionally, the process of technological commercialization faces cultural challenges within the university; researchers still view the commercial approach as solely seeking personal wealth, which may compromise the culture of commitment to nobler goals such as knowledge generation through research.

However, the lack of a dedicated and specialized TT structure within the centers is highlighted as a limitation. Although there are some individuals responsible for this activity, such as the TT coordinator, these professionals often do not possess the necessary competencies to effectively lead the TT process. This underscores the importance of investing in training and staff development in this area to maximize the TT potential of the research centers.

Finally, internal university bureaucracy was cited as a significant barrier. Bureaucratic processes can be lengthy and complex, which may discourage companies from seeking partnerships with research centers. This bureaucracy may include internal approvals as well as issues related to intellectual property and contracts.

ORIGINALITY/VALUE: Therefore, the aim of this study is to investigate the integration of research centers linked to USP for the TT process. Considering its prominent position in the international higher education and research landscape, ranked as the 85th best university in the world and the first in Latin America by the QS World University Rankings (2023), USP plays a crucial role in disseminating knowledge and practices related to TT, promoting innovation and collaboration among various institutions. The main novelty of this work lies in presenting the challenges for integrated TT management, highlighting the importance of the interface between research centers and companies. This model aims to enhance TT strategies at USP and other academic institutions, contributing to more effective management of innovation and TT.

PRACTICAL/SOCIAL IMPLICATIONS: Conclusion

The identified impediments highlight the need to overcome challenges to promote more effective interaction between research centers and companies in the TT process. Investing in training and personnel development, as well as in a clear strategy for exposing patents to the market, can help mitigate these challenges and promote greater

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

effectiveness in TT. Additionally, it is important to address cultural resistance within the university and seek ways to encourage a culture more open to innovation and entrepreneurship. Streamlining internal bureaucracy is also essential to expedite the TT process and facilitate collaboration with companies.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: A limitation of this study lies in the sample of intermediaries investigated, which may not fully represent the diversity of organizations involved in TT. Research aimed at mapping an efficient integrated management model is recommended, taking into account the different types of intermediaries and their interfaces in TT.

KEYWORDS (3-5)

Technology Transfer, Integrated Management, Intermediaries, Universities, Innovation

REFERENCES

- Audretsch, D. B., Lehmann, E. E., & Wright, M. (2014). Technology transfer in a global economy. *Journal of Technology Transfer*, 39(3), 301–312. <https://doi.org/10.1007/s10961-012-9283-6>
- Battistella, C., De Toni, A. F., & Pillon, R. (2016). Inter-organisational technology/knowledge transfer: a framework from critical literature review. *Journal of Technology Transfer*, 41(5), 1195–1234. <https://doi.org/10.1007/s10961-015-9418-7>
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations. *Research Policy*, 29(2), 109–123.
- Watkins, A., Papaioannou, T., Mugwagwa, J., & Kale, D. (2015). National innovation systems and the intermediary role of industry associations in building institutional capacities for innovation in developing countries: A critical review of the literature. *Research Policy*, 44(8), 1407–1418. <https://doi.org/10.1016/j.respol.2015.05.004>

CONTACT INFO

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Renan Rocha	Brasil	Universidade de São Paulo	renan.rocha@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: University-industry interaction channels in dynamic environments: a framework proposed inspired by the UFRJ Science Park

TYPE (a. original research)

TRACK: Collaborative Research and Development

PURPOSE: The aim of this study is to propose a theoretical model for performance management in collaborative projects stemming from the university-industry relationship. The proposed *Quadrant Model* gauges the intensity of innovation that the company establishes with the university. This model, integrates premises from approaches based on the classification of project types as described by Leonard-Barton (1995) and Perkmann et al. (2019). This includes an analysis of all collaborative innovation projects developed by transnational companies residing in the UFRJ Science Park. The developed *Quadrant Model* contributes to a deeper and more effective understanding of innovation management, providing a framework that can guide management practices and decision-making in innovative environments.

DESIGN/METHODOLOGY/APPROACH: From an exploratory and qualitative study of multiple cases, information was extracted that paved the way for the construction of a management tool that demonstrates how the company perceives and interacts with the capabilities of the university and how it endeavors to absorb knowledge and innovations generated by the academic environment. This study analyzed 332 projects from six R&D Centers of large companies with over 7 years of residency in the Park. The R&D managers of the companies classified each project based on five dimensions/channels regarding the intensity of innovation, as well as the type of interaction involved in the projects. Thus, based on the taxonomy of interaction channels (*Learning and Image, Problem Solving, Experimentation and prototyping, Implementation and integration of new techniques and technologies, and Absorb knowledge to generate internal competencies - Know-how*) we collected information, and the data were distributed in the *Quadrant Model* with two pillars as vertices: Risk and Uncertainty. Thus, it was possible

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

to measure the trajectory and intensity of the innovation undertaken and understood by the company in its interaction with the university.

FINDINGS OR EXPECTED OUTCOMES: Notably, a substantial portion of the projects developed by the company in collaboration with the university has been focused on two channels: *Learning and Image* (37.6%), and *Problem-Solving* (30.4%), which represent channels of lower intensity and complexity of innovation. From a financial perspective, projects with higher uncertainty and risk tend to entail a greater investment of resources. The channels of *Experimentation and Prototyping*, along with the *Implementation and integration of new techniques and technologies*, are less frequent in absolute terms, but they involve a significant allocation of resources by resident companies, being the channels with higher outlays, positively impacting the company's trajectory, given that these channels involve higher degrees of risk and uncertainty in their developments.

ORIGINALITY/VALUE: This article provides two original contributions for the different interactions of University-Industry. The first one is a theoretical framework combining models and international literature, adapting to projects in U-I cooperation of companies residing in Technological Parks. The second is the categorization and additional analysis of factors closely related to the capacity of the companies technological absorption.

PRACTICAL/SOCIAL IMPLICATIONS: A tool based on the Quadrant Model brings important elements to decision-making in the innovation environment. This implies that it will be up to the management of the environment to develop brokerage actions for better intermediation between supply and demand. It means the environment must be prepared to identify and offer university capabilities aligned with the company's interests, resources, policies, and absorptive capacity.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: As a future perspective, it would be interesting to conduct the methodology for classifying channels from the perspective of the academics/coordinators involved in the joint project with the company.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

KEYWORDS (3-5): Science Park of UFRJ; Absorption Capacity; University-industry; Interaction channel

REFERENCES:

- Berbegal-Mirabent, J., Sabaté, F., & Cañabate, A. (2012). Brokering knowledge from universities to the marketplace: The role of knowledge transfer offices. *Management Decision*, 50, 1285–1307.
- Bishop, K., D’Este, P., & Neely, A. (2011). Gaining from interactions with universities: Multiple methods for nurturing absorptive capacity. *Research Policy*, 40(1), 30-40.
- Cabral, R. and Dahab, S. (1992) Science parks in developing countries: the case of BIORIO in Brazil. *International Journal of Technology Management*, 16, 726–739.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, 128-152.
- Etzkowitz, H., de Mello, J. M. C., & Almeida, M. (2005). Towards “meta-innovation” in Brazil: The evolution of the incubator and the emergence of a triple helix. *Research policy*, 34(4), 411-424.
- Etzkowitz, H., & Zhou, C. (2018). Innovation incommensurability and the science park. *R&D Management*, 48(1), 73-87.
- Keynes, J. M. (1937). The general theory of employment. *The quarterly journal of economics*, 51(2), 209-223.
- Knight, F. H. (1921). *Risk, uncertainty and profit* (Vol. 31). Houghton Mifflin.
- Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic management journal*, 13(S1), 111-125.
- Leonard, D. (1995). *Wellsprings of knowledge*. Boston: Harvard business school press.
- Löfsten, H., & Lindelöf, P. (2003). Determinants for an entrepreneurial milieu: Science Parks and business policy in growing firms. *Technovation*, 23(1), 51-64.
- Meyer, M. (2010). The rise of the knowledge broker. *Science communication*, 32(1), 118-127.
- UFRJ Technology Park (2022, June 2). Available in: <http://www.parque.ufrj.br>.
- Perkmann, M., & Walsh, K. (2009). The two faces of collaboration: impacts of university-industry relations on public research. *Industrial and Corporate Change*, 18(6), 1033-1065.
- Rapini, M. S., Chiarini, T., Bittencourt, P., & Caliri, T. (2019). The intensity of private funding and the results of university? Firm interactions: the case of Brazil. *Innovation & Management Review*, 16(2), 161-184.
- Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of management review*, 27(2), 185-203.
- Zouain, D. M., & Plonski, G. A. (2015). Science and Technology Parks: laboratories of innovation for urban development-an approach from Brazil. *Triple Helix*, 2(1), 1-22.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Kelyane Silva	Brazil	Universidade Federal do Rio de Janeiro (UFRJ)	kelyane@facc.ufrj.br
Lydia Bares Lopes	Spain	University of Cadiz	lydia.bares@gm.uca.es
Thiago Negrão Chuba	Japan	Kyoto University	negraochuba.thiago.d45@kyoto-u.jp
Vicente Antônio de Castro Ferreira	Brazil	Universidade Federal do Rio de Janeiro (UFRJ)	vicente@coppead.ufrj.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Public policies for innovation and electrification in the automotive sector: examples from the USA, China and Germany

TYPE: original research

TRACK: 8 Collaborative Research and Development / Industry-academia research collaborations

PURPOSE: In 2014, the European Union introduced the Euro 6 System, which set regulatory standards for the maximum limit of pollutant emissions from combustion vehicles. This led to increased technological innovation in the automotive industry in several countries as they sought sustainable solutions. As a result, electric vehicles (EVs) have become a well-established reality in countries like Norway, with 104,600 sold in 2023. China and the US are also transitioning to electromobility, while other countries like Brazil are still catching up. This research aims to analyze and compare the main EV transition policies in Germany, China, and the USA and how they involve different actors such as government, industry, academia, and civil society. The study will also look into the policies implemented in Brazil, such as Rota 2030 and Mover, to generate insights that can assist policymakers in developing effective policies to encourage EV adoption in Brazil. The specific objectives of the research are to (1) Identify and analyze the emerging scientific literature on the topic; (2) Analyze the main national EV transition policies in the three countries based on factors such as financial and non-financial incentives, technological support, and charging infrastructure; and (3) Identify the key dimensions and variables that representatives of the government, industry, academia, and civil society in Brazil consider necessary and compare them with the actions taken by the government and market actors, proposing changes and improvements where appropriate.

DESIGN/METHODOLOGY/APPROACH: The research methodology combines qualitative and quantitative analysis, adopting a quali-quant approach. The research employs various methodological procedures such as bibliographic research, document analysis, content analysis, and classification and ordering of collected data. Additionally, it aims to apply the Hierarchical Process Analysis (HPA) method proposed by Saaty (1986) to determine the importance that actors from the four spheres attribute to the dimensions and variables that define public policy for Electric Vehicles (EV). The theoretical framework of the research has two main focuses: public policy and innovation that lead to specific concepts like public policies for electric vehicles, innovation policy, socio-technical transitions, innovation systems, Triple Helix, transition management, and sustainable transitions for policymaking. The research will use a questionnaire divided into two parts for collecting primary data for the HPA method. The first part will have open questions, and the second part will be closed with a Likert scale to measure the importance of the dimensions (infrastructural, institutional and social, and technical and economic) and the EV policy variables, according to the importance attributed by each group of the four spheres. The research sampling

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

will use "snowball sampling," a form of non-probabilistic sampling that uses "reference chains." For secondary data, the research will use various sources such as the International Energy Agency (IEA) Policy and Measures Database, websites such as the International Organization of Motor Vehicle Manufacturers (OICA), the International Renewable Energy Agency (IRENA), official documents, private archives of private institutions and business documents, and institutional bases.

FINDINGS OR EXPECTED OUTCOMES: Several horizontal and specific policies to support the energy transition in the automotive industry chain were identified in the countries studied. Analyzing these policies generated knowledge and insights into the preferences and perspectives of the different actors involved, contributing to a better understanding of the current scenario and possible future directions. For Brazil, encouraging the production and commercialization of EVs instead of combustion vehicles, as is currently done, is one way forward, in addition to encouraging the production of components, particularly the battery, which are critical elements in the transition. Carrying out and attracting research in automotive technology is another field that needs to be addressed by public policies. Zhang et al. (2014) emphasize the importance of learning from effective policies and mechanisms adopted by other countries and adapting them according to each country's specific situation. Thus, this research allows us to understand the experiences of other countries whose transition to EV is already more advanced or well-established.

ORIGINALITY/VALUE: The study provides a comprehensive analysis of transition policies to electric vehicles from the perspective of multiple actors, which can generate new knowledge and insights relevant to electric mobility and public policies.

PRACTICAL/SOCIAL IMPLICATIONS: The findings of this research can aid in the development and execution of policies related to electric vehicle adoption, impacting government decisions, automotive industry strategies, and consumer behavior.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Researchers should consider expanding the sample size and including other countries to conduct a more comprehensive comparative analysis. However, it is essential to acknowledge the limitations of the chosen method, such as the limited generalization of results due to the unique characteristics of each interest group.

KEYWORDS: electric vehicle, public policies, innovation in the automotive sector.

REFERENCES:

- Amaral, M. G.; Mineiro, A. A. da C.; & Faria, A. F. (Org.) (2022). *As hélices da inovação: interação universidade-empresa-governo-sociedade no Brasil* (v. 1, 1ª ed., 556 p.). Curitiba, PR: CRV.
- Geels, F. W. (2005a). *Technological transitions and system innovations: a co-evolutionary and socio-technical analysis*. Edward Elgar.
- International Energy Agency (IEA) (2022). *Global EV Outlook 2022: Securing supplies for an electric future*, IEA, Paris. Disponível em: <https://www.iea.org/reports/global-ev-outlook-2022>
- Saaty, T. L. (1986). Axiomatic foundation of the analytic hierarchy process. In *Management Science* (Vol.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

32, Issue 7).

Sovacool, B. K. (2017). The History and Politics of Energy Transitions: comparing contested views and finding common ground. In Arent, D., Arndt, C., Miller, M., Tarp, F., & Zinaman, O. (Ed.), *The Political Economy of Clean Energy Transitions* (WIDER Studies in Development Economics) (Illustrated Ed., Cap. 2, pp. 16 – 38). Oxford, UK: Oxford University Press.

Turbo (8 de janeiro de 2024). Futura “normalidade”? Elétricos já representam 82% das vendas na Noruega. Recuperado de

<https://www.turbo.pt/noruega-vendas-eletricos/#:~:text=Os%20ve%C3%ADculos%20el%C3%A9tricos%20representaram%2082%2C4%25%20do%20mercado%20da%20Noruega,quais%20104%20600%20eram%20el%C3%A9tricos.>

Zhang, X., Xie, J., Rao, R., & Liang, Y. (2014). Policy incentives for the adoption of electric vehicles across countries. *Sustainability* (Switzerland), 6(11), 8056–8078. Recuperado de <https://doi.org/10.3390/su6118056>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Marcela Sayumi de Souza Ito	Brasil	Fluminense Federal University	marcelasayumi@id.uff.br
Marcelo Gonçalves do Amaral	Brasil	Fluminense Federal University	marceloamaral@id.uff.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

TITLE: Fostering Collaboration to Combat Antimicrobial Resistance in Brazil: the CEPID ARIES Ecosystem

TYPE: c. practical case / experience analysis

TRACK: 8. Collaborative Research and Development

PURPOSE: Antimicrobial resistance (AMR) poses a significant threat to global health and has the potential to undermine the advancements achieved in healthcare over the past decades. Addressing this issue effectively requires collaborative efforts across research, public policy, and operational organizations. The Antimicrobial Resistance Institute of Sao Paulo (CEPID ARIES) in Brazil will serve as an exemplar of such collaboration within the Triple Helix framework, aiming to comprehensively tackle AMR by harnessing synergies among academia, government, and private companies. The purpose of this abstract is to highlight CEPID ARIES innovative approach and its potential to bridge the gap between scientific knowledge and practical application in combating AMR.

DESIGN/METHODOLOGY/APPROACH: CEPID ARIES employs a multifaceted approach involving interdisciplinary research, evidence-based policy recommendations, open innovation strategies, and partnerships. Researchers will collaborate with policymakers to conduct a comprehensive study on antimicrobial usage in healthcare settings, analyzing clinical and environmental patterns to generate actionable insights for policy formulation. Through effective knowledge transfer mechanisms, research findings could inform the development of antimicrobial stewardship programs, optimized antimicrobial use, and containment of resistance spread. Partnerships with diverse stakeholders, including healthcare providers, government organizations, companies, and DeepTech startups, will be set up to enhance and foster best practices in antimicrobial management, aiming the development of innovative processes, products, services and policies.

EXPECTED OUTCOMES: The expected outcomes include the ascent of CEPID ARIES as a beacon of innovation in the battle against AMR, driven by the translation of basic research insights into tangible actions and applications. These outcomes encompass optimized antimicrobial use, containment of resistance spread, and the development of market-ready solutions addressing critical gaps in AMR mitigation efforts, ensuring sustained impact within society.

ORIGINALITY/VALUE: This abstract underscores the value of collaboration within the Triple Helix framework in addressing the complex challenge of antimicrobial resistance. CEPID ARIES illustrates how synergistic efforts among research, basic science, policy makers, and organizations can yield impactful outcomes. This collaborative approach ensures the continued efficacy of antimicrobial agents for future generations.

PRACTICAL/SOCIAL IMPLICATIONS: The initiatives outlined here contribute to evidence-based policy recommendations, the development of antimicrobial stewardship programs, and the co-development of novel products, processes and diagnostic technologies. Socially, these efforts contribute to safeguarding public health globally by addressing the threat of AMR and ensuring fair access to innovative interventions.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Looking ahead, CEPID ARIES recognizes the imperative to continue adapting and innovating in the face of evolving challenges posed by antimicrobial resistance (AMR). While significant strides have been made in understanding and

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

addressing AMR, several key areas call for further attention to sustain progress and mitigate future risks. There is a critical need to strengthen surveillance and monitoring systems to track the emergence and spread of antimicrobial-resistant pathogens effectively. CEPID ARIES aims to invest in advanced surveillance technologies and data analytics to enhance early detection and response capabilities. Given the growing threat of antimicrobial resistance, there is an urgent need to explore alternative therapies and diagnostics that can circumvent resistance mechanisms. CEPID ARIES intends to foster research into novel treatment modalities such as phage therapy, and precision medicine. Recognizing the interconnectedness of human, animal, and environmental health in driving antimicrobial resistance, CEPID ARIES will prioritize the integration of a One Health approach into its research and intervention strategies. This entails collaborative efforts across multiple sectors to address AMR comprehensively, considering factors such as antimicrobial use in agriculture, aquaculture, and environmental contamination. Additionally, CEPID ARIES will continue to advocate for policies that incentivize investment in research and development of new products or services, as well as support initiatives to streamline regulatory pathways for novel therapies and diagnostic methods.

Antimicrobial resistance is a global health public problem that transcends borders, needing collaboration and knowledge sharing at an international level. CEPID ARIES is committed to fostering partnerships with institutions and stakeholders worldwide to exchange best practices, data, and coordinate responses to AMR on a global scale. In summary, CEPID ARIES remains dedicated to advancing the fight against antimicrobial resistance by embracing innovative approaches. By prioritizing these future directions, the institute aims to contribute significantly to the global effort to preserve the efficacy of antimicrobial agents and safeguard public health for generations to come.

Name and Surname	Country	Institution	Email
Alex Yuri Simões Sato, PhD	Brazil	UNIFESP/CEPID ARIES	alex.yuri@unifesp.br
Ana Cristina Gales, MD, PhD	Brazil	UNIFESP/CEPID ARIES	ana.gales@unifesp.br
Arnaldo L. Colombo, MD, PhD	Brazil	UNIFESP/CEPID ARIES	arnaldo.colombo@unifesp.br
Moacir M. Oliveira Jr, PhD	Brazil	USP/CEPID ARIES	mirandaoliveira@usp.br

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Implementing the Triple Helix Model: Collaborative Approach to Sustainable Soil Remediation Strategy

TYPE (a. original research, b. research Design or c. practical case/experience analysis)

TRACK: (8: Collaborative Research and Development)

PURPOSE: Reporting on the outcome of collaborative research

DESIGN/METHODOLOGY/APPROACH: The methodology employed in this study began with the identification of the issue at hand: soil pollution caused by petroleum hydrocarbons spill. Subsequently, a call for proposals was initiated by an energy company, inviting research institutions to propose sustainable solutions. Following this, a knowledge institution emerged as the lead researcher, overseeing the investigation, while regulatory bodies monitored the process to ensure alignment with government policies. Additionally, an energy and technology company spearheaded data analytics efforts to provide valuable insights. The research primarily focused on the formulation of a product through composting techniques to serve as a soil amendment, aiming to address and mitigate the soil pollution effectively.

FINDINGS OR EXPECTED OUTCOMES: The findings or expected outcomes of this project include:

- Identification of a formulation approach for the remediation product.
- Determination of the optimal application rate for the remediation of contaminated soil.
- Establishment of guidelines for the effective application of the remediation product in soil remediation efforts.

ORIGINALITY/VALUE: The originality and value of this project lie in its innovative approach to sustainable soil remediation. By formulating a product through collaborative efforts with relevant stakeholders, the project aims to address soil pollution effectively while meeting regulatory requirements. This approach not only fosters environmental sustainability but also promotes stakeholder engagement and cooperation, thereby contributing to the advancement of sustainable remediation practices.

PRACTICAL/SOCIAL IMPLICATIONS: The practical and social implications of this project are twofold. Firstly, it encourages interdisciplinary research collaborations, fostering a culture of knowledge exchange and cooperation among experts from diverse fields. Secondly, the project

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

facilitates the practical and sustainable remediation of soil contaminated by petroleum hydrocarbons. By addressing the production and transportation-related contamination effectively, it contributes to environmental restoration and promotes healthier ecosystems, benefiting communities and ecosystems alike.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The collaboration established in this project sets the stage for further research aimed at expanding the application of the research outcomes to large-scale soil remediation efforts across Nigeria. However, it's important to note the following limitations:

- The effectiveness of the formulated product in various soil types and environmental conditions requires further investigation.
- Long-term monitoring of remediated sites is needed to assess the sustainability and persistence of remediation effects.

KEYWORDS (3-5): Environmental Remediation, Collaborative Approach, Sustainable Practices.

REFERENCES

Mikhailov, A., & Puffal, D. P. (2023). University-industry Collaboration and Innovation in Low-tech Industries: the Case of Brazil. *Triple Helix*, 1-30. doi:<https://doi.org/10.1163/21971927-bja10042>

Pacheco, C., & Paul, B. (2023). Collaboration in Innovation Systems: A Study in India. *Triple Helix*, 1-66. doi:<https://doi.org/10.1163/21971927-bja10039>

Ahmed I.B., Nwaichi E.O. and Ejikeme U.1. (2023). A community-based innovative approach of deriving a functional compost for remediation of crude oil contaminated soil. In: *The Book of Proceedings from the 6th Biennial International Conference for the Organization for Women in Science for the Developing World Nigeria (OWSD 2023)*. Nwaichi & Nduka Ed. Atlantis Springer Nature. Vol 37, Pp 4 - 25.

Nwaichi, E.O. and Osuoha, J. O. (2021). Has the National policy on environmental pollution control in Nigeria been neglected in the Niger Delta region? An update. *Environment, Development and Sustainability*. 24, 12494–12517.

Ahmed I.B., Nwaichi E.O., Ejikeme U.1, Ugbebor J.N., and Arokoyu S.B. (2022). Cost reduction strategies in the remediation of petroleum hydrocarbon contaminated soil. *Open Research Africa*, 5(21), 1-17.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Ismail Baba Ahmed	Nigeria	National Oil Spill Detection and Response Agency (NOSDRA), Abuja, Nigeria	Ahmed.Ismail@nosdranigeria.ng
Eucharia Oluchi Nwaichi	Nigeria	University of Port Harcourt, Choba, Nigeria.	eucharia.nwaichi@uniport.edu.ng
Ejikeme Ugwoha	Nigeria	University of Port Harcourt, Choba, Nigeria.	ejikeme.ugwoha@uniport.edu.ng
Chinyelu Nnoli	Nigeria	Nigerian Content Development and Monitoring Board (NCDMB), Yenagoa, Nigeria.	nnoli.chinyelu@ncdmb.gov.ng
Ime Ekanem	Nigeria	National Oil Spill Detection and Response Agency (NOSDRA), Abuja, Nigeria.	Ekanem.Akpan@nosdranigeria.ng
Kenneth Aroh	Nigeria	National Oil Spill Detection and Response Agency (NOSDRA), Abuja, Nigeria.	Aroh.Nnanna@nosdranigeria.ng
Bright Ofemume	Nigeria	BW Offshore, Lagos, Nigeria	bright.ofemume@bwoffshore.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Egbe T.I	Nigeria	CypherCrescent Ltd, Port Harcourt Rivers State, Nigeria	thankgod.egbe@cyphercrescent.co m
Aku M.A	Nigeria	CypherCrescent Ltd, Port Harcourt Rivers State, Nigeria	michael.aku@cyphercrescent.com

XXII Triple Helix Conference – 2024

TITLE: Design Instructional for the Translation of Scientific

Knowledge TYPE: Original Research

TRACK: 8. Collaborative Research and Development

PURPOSE: The translation of scientific knowledge is a growing topic in academic literature, which studies how administrative science can simplify the dissemination of scientific knowledge and practical implementation. In non-governmental organizations, knowledge translation is related to training and workshops. In the scientific literature of administrative sciences, instructional design is also a rising topic in the areas of strategy and management, which emphasizes the possibility of designing instructions by universities and organizations for positive socio-environmental impact. The instructional design construct is recent, making literature and its relationships with the themes under construction emerge. In this sense, new studies on instructional design are related to the development of construction. For a better understanding of possible relationships, this objective work presents an analysis of the literature with the mapping of the instructional design construct.

DESIGN/METHODOLOGY/APPROACH: The work adopted the method of systematic literature review, to advance the portrait of the current panorama of international scientific production on the construct and to propose a research agenda in management and business. The database used by Web of Science, being used as search criteria for the terms "Instructional Design" and its variations, resulted in a total of 6191 works, 3680 of which were articles. For the purpose of the search, we used the following filters: "Business and management", "Educational research", "psychology", "information science and library science", "art and humanities", "business economics", "art", "humanity", and other topics", "public administration". To deepen the research topic on "creativity", with the Boolean "AND" and a critical reading of the title, we summarize the keyword analysis. As results, 304 articles were found that deal with instructional design in the humanities, arts, economics, and administrative sciences.

FINDINGS OR EXPECTED OUTCOMES: The analyzes considered the proposed divisions, bibliometric indicators, and content indicators, identifying an evolution of the field from 2020 onwards. Four clusters of research traditions were found: relationships and cognition, universities and collaboration, groups and experiments, instrument and presence. Future avenues for researchers and scholars on how to relate scientific knowledge translation and instructional design are proposed.

PRACTICAL/SOCIAL IMPLICATIONS: Instructional design can be considered a facilitator of the translation of scientific knowledge for society, as the triple helix model suggests. Design is a solution system to solving teaching problems, and teaching events should be planned based on learners that integrate teaching subjects, materials, creative techniques, teaching methods and assessments. Definitions are varied from different

instructional designs based on teaching approaches and it was accepted that students should construct their own knowledge. The authors believe that deepening the study of relationships contributes to the practical implementation of scientific concepts and knowledge by organizations. The main paths will be highlighted for researchers to be able to translate their knowledge into different formats and into instructions for non-governmental organizations, associations and foundations that use scientific knowledge for the strategy and achievement of the United Nations Sustainable Development Goals (SDGs).

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This research is part of a research group that objectively analyzes the facilitators of knowledge translation. It is recommended that future researchers deepen their knowledge regarding video course formats and the dynamics oriented towards the teaching-learning of exact sciences. Studies looking at how instructional design relates to relationship building and cognitive observations are also amenable. Finally, studies that deepen relationships with design themes and related constructs, such as design thinking, can be explored.

KEYWORDS (3-5): design instructional, knowledge translation, scientific knowledge diffusion

REFERENCES

Arrington, T. L., Moore, A. L., & Bagdy, L. M. (2021). K12 practitioners' perceptions of learning from failure, creativity, and systems thinking: a collective case study. *TechTrends*, 65(4), 636-645.

Cheng, V. M. (2018). Consensual assessment of creativity in teaching design by supportive peers—its validity, practicality, and benefit. *The Journal of Creative Behavior*, 52(1), 5-20.

Shen, T. L., & Lai, J. C. (2018). Instructional design of creating creative and imaginative works. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(4), 1509-1517.

Stefaniak, J. (2021). Leveraging failure-based learning to support decision-making and creative risk in instructional design pedagogy. *TechTrends*, 65(4), 646-652.

Sun, L., & Zhou, L. (2023). Does text-based programming improve K-12 students' CT skills? Evidence from a meta-analysis and synthesis of qualitative data in educational contexts. *Thinking Skills and Creativity*, 49, 101340.

Wang, Y., Zhou, Z., & Paas, F. (2023). Effects of instruction colour and learner empathy on aesthetic appreciation of Chinese poetry. *Instructional Science*, 51(4), 617-637.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Wu, W. C. V., Manabe, K., Marek, M. W., & Shu, Y. (2023). Enhancing 21st-century competencies via virtual reality digital content creation. *Journal of Research on Technology in Education*, 55(3), 388-410.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Marina Cerqueira Marinho	Brazil	University of São Paulo	marina.marinho@usp.br
Rafael Moraes Pereira	Brazil	University of São Paulo	rmoraes@usp.br
Martinho Isnard Ribeiro de Almeida	Brazil	University of São Paulo	martinho@usp.br
Pedro Mascarenhas de Barros	Brazil	University of São Paulo	pedro.barros9608@usp.br
Arthur Silva Santos	Brazil	University of São Paulo	arthur.crss@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE:

Critical Success Factors in Technology Transfer: Case study involving digital technologies

TYPE (a. original research, b. research Design or c. practical case / experience analysis)

Original Research

TRACK: (Indicate one Track described in the Call for Abstracts, pages 4 and 5: <https://triplehelixconferencebrazil.com/wp-content/uploads/2024/02/call-for-abstracts-THC2024-v20240228.pdf>)

8. Collaborative Research and Development

PURPOSE:

This study presents the results of a case study in a Brazilian public research center on the characteristics of Technology Transfer (TT) processes involving digital technologies. TT has already been extensively studied from different angles and under different aspects, as pointed out by Bengoa et al. (2021), Qian et al. (2022) e Siegel et al. (2023), however, given the growing digitalization of the economy, observed by technologies that are on our doorstep, such as IOT, Industry 4.0, Digital Agriculture, 5G and 6G Networks, intensive use of Artificial Intelligence, among others, becomes crucial understand how these technological innovations can impact knowledge production processes and their subsequent adoption by society, as well as impact TT processes (Bengoa et al., 2021; da Silva et al., 2022; Galera-Zarco et al., 2020; Verhoef et al., 2021).

DESIGN/METHODOLOGY/APPROACH:

This research is characterized as a case study supported by qualitative and quantitative procedures. Qualitative as the investigation will be carried out based on documentary analysis and multiple sources of

evidence (Yin, 2015), as well as the Content Analysis method (Bardin, 1977) will be applied to the open questions of the questionnaire applied. And quantitative, as descriptive and inferential statistics techniques were used to characterize the findings and seek associations between the observed variables, using correlation tests and comparison of means for independent samples as an option (Barbetta, 2012; Field, 2009).

FINDINGS OR EXPECTED OUTCOMES:

From the literature, 29 key factors were systematized that have the potential to contribute to the success of the Technology Transfer process. Through this case study we come to the conclusion that although all factors have some level of influence on the result, for the digital assets of the ICT studied, the factors that are most associated with TT performance are communication, availability of resources, a qualified and sufficient TT team, a technological solution that has competitive advantages and the choice of the appropriate TT modality.

ORIGINALITY/VALUE:

The present study stands out for the systematization of a theoretical model on the factors that influence TT and its subsequent validation in a case study involving only Digital Innovation Assets developed by a Public Research Center. The findings point to differences in cases where innovation occurred in a closed or open manner (Open Innovation), indicating crucial points for the development of solutions through strategic partnerships.

PRACTICAL/SOCIAL IMPLICATIONS:

The identified factors contribute so that all actors in the TT process can focus their efforts on strengthening actions that are identified as crucial to the success of TT. Thus, managers, analysts, researchers and entrepreneurs can, from the beginning of the partnership, pay attention to aspects of the research center, technology, partner company and relationship that are identified as critical to the success of the TT process, prioritizing the choices that allow a higher level of return and security, enhancing the

adoption of transferred technologies.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Throughout the research, vast and promising opportunities were identified. A next step could involve evaluating additional metrics for other types of assets, expanding understanding of the factors that influence TT success in different technological contexts. Furthermore, comparisons within the same institution, but with different types of assets, or comparative studies between different research institutions would be valuable to understand how specific factors vary according to the type of technology involved, different management styles and different environments. These suggestions for future work have the potential to expand and deepen knowledge about the technology transfer process, contributing to the development of more effective and adaptable strategies in different contexts.

KEYWORDS (3-5)

TECHNOLOGY TRANSFER, CRITICAL FACTORS, OPEN INNOVATION, DIGITAL INNOVATION

REFERENCES

Barbetta, P. A. (2012). *Estatística aplicada às ciências sociais* (8a ed.). Ed. UFSC.

Bardin, L. (1977). *Análise de conteúdo*. Lisboa: Edições, 70, 225.

https://www.academia.edu/download/61102466/BARDIN_L_1977._Analise_de_conteudo._Lisboa_edicoes_70_225.20191102-5693-11evk0e.pdf

Bengoa, A., Maseda, A., Iturralde, T., & Aparicio, G. (2021). A bibliometric review of the technology transfer literature. *The Journal of Technology Transfer*, 46(5), 1514–1550.

<https://doi.org/10.1007/s10961-019-09774-5>

da Silva, V. L., Kovalski, J. L., & Pagani, R. N. (2022). Fundamental elements in Technology Transfer: an in-depth analysis. *Technology Analysis & Strategic Management*, 34(2), 223–244.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

<https://doi.org/10.1080/09537325.2021.1894328>

Field, A. (2009). *Descobrimos a Estatística usando o SPSS* (2a ed.). Artmed.

Galera-Zarco, C., Opazo-Basáez, M., Marić, J., & García-Feijoo, M. (2020). Digitalization and the inception of concentric strategic alliances: A case study in the retailing sector. *Strategic Change*, 29(2), 165–177. <https://doi.org/10.1002/jsc.2319>

Qian, F., Hong, J., Hou, B., & Fang, T. (2022). Technology Transfer Channels and Innovation Efficiency: Empirical Evidence From Chinese Manufacturing Industries. *IEEE Transactions on Engineering Management*, 69(5), 2426–2438. <https://doi.org/10.1109/TEM.2020.3014731>

Siegel, D., Bogers, M. L. A. M., Jennings, P. D., & Xue, L. (2023). Technology transfer from national/federal labs and public research institutes: Managerial and policy implications. *Research Policy*, 52(1), 104646. <https://doi.org/10.1016/j.respol.2022.104646>

Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>

Yin, R. K. (2015). *Estudo de Caso - 5.Ed.: Planejamento e Métodos*. Bookman Editora.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Breno Assunção	Brazil	University of Brasilia / Embrapa	breno.assuncao@embrapa.br
Cleidson Dias	Brazil	University of Brasilia / Embrapa	cleidson.dias@embrapa.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: Building Innovative Universities: a new framework for Dynamic Capabilities in Open Innovation

TYPE: A. Original Research

TRACK: Track 8 Collaborative Research and Development

PURPOSE:

Universities are important players in the innovation process and in economic development, as they act as repositories of technological knowledge. This knowledge, when accessed by companies, can reduce the cost and time taken to develop products and services (Chesbrough 2006a, 2006b).

There is a consensus in the literature that to establish partnerships and for them to be successful, advanced institutional policies and university administrations capable of leading them are needed (Soares, Torkomian, Nagano 2020; Leih, Teece 2016). In other words, for open innovation to be successful, actions to allow access to university knowledge are not enough; legal designs, institutional policies and organizational changes at the university are also needed, which translate into capabilities to manage different collaboration channels and promote interaction with external partners.

This paper has a twofold aim. First, it aims at deepening the understanding of which dynamic capabilities may boost collaborative endeavors between universities and firms. It aims to answer the following research question: in the realm of open innovation, what dynamic capabilities universities should develop to improve the management of different collaboration channels with companies? The second aim is to provide a novel managerial framework which offers actionable insights to managers in universities.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

DESIGN/METHODOLOGY/APPROACH:

The methodologies used to build the framework involved literature review and document analysis. We conducted a comprehensive review of academic literature as well as grey literature related to open innovation, dynamic capabilities, and university-industry collaboration.

First, we conducted a systematic literature review. The following expressions were searched on ISI Web of Science database: "universit*" OR "technology transfer office*" OR "TTO*" OR "science park*" OR "incubator*" AND "capabilit*" OR "dynamic capability*". The inclusion of incubators and science parks in the search is justified by the frequent presence of organizations in universities, seeking to maximize the corresponding results.

In addition to the systematic review, we also employed the snowball technique. To this end, we used the online platform ResearchRabbit to identify relevant citations and references from previously selected articles. The platform allows you to access and discover the citations and references of selected articles. The platform also has an artificial intelligence system that offers suggestions of relevant articles to build a customized collection.

FINDINGS OR EXPECTED OUTCOMES:

The literature partially addresses the managerial capabilities of Higher Education Institutions (HEIs) in the open innovation scenario, but gaps remain on how universities can leverage these interactions in scenarios of uncertainty, contingency and change. In particular, the thesis put forward in this paper is that there are specific dynamic capabilities for managing different collaboration channels that can leverage solid open innovation partnerships.

ORIGINALITY/VALUE:

The main contribution of this study is the presentation of a novel framework of dynamic capabilities

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

applied to university industry collaboration. Drawing on Teece's dynamic capabilities framework (Teece et. al. 1997; Teece 2007), we develop new low order dynamic capabilities for distinct channels of university-industry collaboration. The framework encompasses three key channels and its respective low order capabilities (Linder, Jarvenpaa, Davenport 2003),: (i) stimulating entrepreneurship and spin-off creation; (ii) establishing partnerships for co-development of products, services, and solutions; and (iii) strategic management of intellectual property portfolios for diffusion and commercialization of research results.

PRACTICAL/SOCIAL IMPLICATIONS and DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: :

In summary, the message of this paper is that it is not enough to think of macro-level institutional changes such as laws and regulations as a way of optimizing university-business interaction. Changes are especially needed at the level of organizations, and particularly in universities regarding legal designs to improve organizational capacities in cooperation with companies in an open innovation paradigm marked by uncertainties, contingencies and variations.

This text has sought to integrate studies of open innovation, university-business relations and dynamic capabilities to offer a framework of dynamic capabilities related to the different channels of university-business interaction. The framework lists detection, capture and transformation capabilities linked to the different existing collaboration channels

KEYWORDS (3-5): University-Industry Collaboration; Management; Dynamic Capabilities; Open Innovation

REFERENCES:

CHESBROUGH, H. Open Innovation: A New Paradigm for Understanding Industrial Innovation. In CHESBROUGH, H., VANHAVERBEKE, W. and J. WEST. Open Innovation: Researching A New Paradigm. Oxford University Press: Oxford, 2006a.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

CHESBROUGH, H., VANHAVERBEKE, W. and J. WEST. Open Innovation: Researching A New Paradigm. Oxford University Press: Oxford, 2006b.

LINDER, J. C.; JARVENPAA, S. L. and DAVENPORT, T. H. "Toward an innovation sourcing strategy", in Sloan Management Review, Summer, vol. 44, n. 4, pp. 43-49, 2003.

SOARES, T. J.; TORKOMIAN, A. L. V; NAGANO, M. S.. University regulations, regional development and technology transfer: The case of Brazil. Technological Forecasting and Social Change, v. 158, p. 120129, 2020.

TEECE, D. J. Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. Strategic Management Journal, v. 28, n. 13, p. 1319–1350, 2007.

TEECE, D.; PISANO, G.; SHUEN, A. Dynamic Capabilities and Strategic Management. In: FOSS, N. (ed.), Resources, Firms and Strategies. Oxford University Press, New York cap. 19, pp. 268-285, 1997.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Rafael Monnerat	Brazil	Unicamp (State University of Campinas)	rmonnerat31@gmail.com

09

**Collaborative Research and
Development**

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Entrepreneurial universities in the context of a small country: Lessons learned and impact on innovation ecosystem

TYPE: original research

TRACK: The role of the Entrepreneurial University and education for Future Innovators

PURPOSE: This study analyzes the performance of the Malta College of Arts, Science and Technology (MCAST) as an entrepreneurial university in the context of Malta, a small country in the central Mediterranean. It evidences the impact of the teaching and other activities on cultivating an entrepreneurial mindset among students, the extent to which these activities are in line with market policies and demands, the effectiveness of the education system in providing students with the necessary skills and knowledge.

DESIGN/METHODOLOGY/APPROACH:

Engaging in qualitative research, the investigation was conducted through document analysis and interviews with MCAST board members and relevant stakeholders. The evaluation was performed within the framework of three projects: 1) Transforming Advanced Water Skilling Through the Creation of a Network of Extended-Reality Water Emulative Centres (WATERLINE), (2022-2025); Higher Education Innovation Growth and Training: heightening sustainable innovation in our HEIs and societies (HEIght), (2021-2023); and EXCEL Winter School for Urban Mobility Leaders (2023, 2024), all of which received co-financing from the European Commission.

The HEIght project main aim was to train staff and students in innovation and entrepreneurship at the participant institutions, giving emphasis in sustainability, focusing on climate change elements and boosting the startup ecosystems. WATERLINE's goal is to create a European Digital Water Higher Education Institution Alliance, based on the quadruple helix model of innovation, leading to the development of the Alliance's research and innovation and educational capabilities, and the entrepreneurship capacity of academics and researchers at the eight universities of the consortium. The EXCEL Winter School offers a transformative journey in sustainable urban mobility and bridges the knowledge gap by empowering students to shape the future of transportation. Fostering an entrepreneurial mindset, students will create impactful ventures, gain insights from industry leaders, explore cutting-edge technology, and engage with local mobility ecosystems.

The significance and function of entrepreneurial universities in the setting of small countries form the basis of this research.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Entrepreneurial universities are key actors in fostering regional entrepreneurial ecosystems, innovation clusters, and knowledge spillover (Ierapetritis, 2019). Besides their role in research and education, they play a crucial role in regional economic development, and are an important element of regional innovation systems and entrepreneurial ecosystems (Wagner et al., 2019). The strategic view by university management, long-term commitment on all levels, sponsors and collaborators within and outside the university, an appropriate organizational infrastructure, and substantial financial resources are key success factors in establishing sustainable entrepreneurial university ecosystems (Lahikainen et al., 2018).

Given its potential impact on the growth of the higher education system and the economy as a whole, the notion of entrepreneurial universities in small nations has garnered considerable attention in recent times (Berács, 2017). However, several open questions remain about the role and impact of entrepreneurial universities in small countries. These questions encompass:

- 1) The **effectiveness of entrepreneurship education** in producing entrepreneurs and fostering a culture of entrepreneurship among students (Mutanda et al., 2018), as a basis to understand the competencies and skills required for entrepreneurial success in small countries, and whether the current entrepreneurship education and business support policies align with the demands of domestic markets (Nikitina et al., 2020).
- 2) The **influence of individual and social factors**, such as family background and career preferences, on the development of entrepreneurial potential and specific entrepreneurial characteristics of young people in small countries (Mitrović et al., 2019) is essential for tailoring entrepreneurship education and support programs to the unique needs and aspirations of students in small country settings.
- 3) The **role of universities in developing an entrepreneurial mindset and whether entrepreneurship teaching is aligned with the mission of the institution** (Davey et al., 2016).
- 4) The **impact of institutional support and environmental perceptions on entrepreneurial intentions among university students** (Álvarez-Risco et al., 2021), leading to understanding the factors that influence entrepreneurial intentions and the extent to which institutional support fosters an entrepreneurial mindset.

Addressing these open questions is crucial for advancing our understanding of entrepreneurial universities in small countries and for developing effective strategies to promote entrepreneurship and innovation in these contexts.

FINDINGS OR EXPECTED OUTCOMES: At MCAST developing the Entrepreneurial Mindset is central in students' educational journey. This is evidenced by the fact that most students at Level 4 and Level 6, despite following different streams in one of the six MCAST institutes, follow an Entrepreneurship module as a core subject. The Level 6 Entrepreneurship curriculum encompasses the lecturing hours and practical application of the theoretical concepts through a cross-institute team-work assignment whereby students from different institutes and/or courses team up to work on various entrepreneurial aspects, such as idea generation, business idea development and sales pitching.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

The students' experience is enhanced through the involvement of industry and the Challenge-based learning methodology, where industry designs a challenge for the students, who explore the challenge and address it via using systems innovation visual tools. MCAST's relationship with industry is crucial in developing students that are prepared for tomorrow's workplace.

ORIGINALITY/VALUE: This research is original for shedding light on the effectiveness and impacts of an entrepreneurial university in a small country context, identifying and responding to open questions identified in the literature. Through case studies of the implementation of projects focused on entrepreneurial education it is possible to identify how MCAST has performed also within the local innovation ecosystem.

PRACTICAL/SOCIAL IMPLICATIONS: By experimenting new approaches and advancing its entrepreneurial curriculum in project-driven activities, MCAST has enhanced its contribution to the local innovation ecosystem. Adopting the triple and quadruple helix innovation approaches in the projects are a means to address real-world, local challenges innovatively, support industrial transformation and the creation of new ventures, and the elaboration of new knowledge to be taken up by policymakers.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This research investigated MCAST's performance in the context of Malta, a small country with particular features that may influence the results. Additional research may contribute to elaborating a theoretical framework to evaluate and foster the entrepreneurial role of universities in small countries or even within regions of larger countries, as well as in the context of regional specialization.

KEYWORDS (3-5): entrepreneurial university, innovation ecosystems, smart water ecosystems

REFERENCES

Álvarez-Risco, A., Młodzianowska, S., García-Ibarra, V., Rosen, M., & Del-Aguila-Arcentales, S. (2021). Factors affecting green entrepreneurship intentions in business university students in COVID-19 pandemic times: case of Ecuador. *Sustainability*, 13(11), 6447.

<https://doi.org/10.3390/su13116447>

Berács, J. (2017). Emerging entrepreneurial universities in university reforms: the moderating role of personalities and the social/economic environment. *Center for Educational Policy Studies Journal*, 4(2), 9-26. <https://doi.org/10.26529/cepsj.201>

Davey, T., Hannon, P., & Penaluna, A. (2016). Entrepreneurship education and the role of universities in entrepreneurship. *Industry and Higher Education*, 30(3), 171-182.

<https://doi.org/10.1177/0950422216656699>

Guerrero, M., Urbano, D., Fayolle, A., Klofsten, M., & Mian, S. (2016). Entrepreneurial universities: emerging models in the new social and economic landscape. *Small Business Economics*, 47(3), 551-563. <https://doi.org/10.1007/s11187-016-9755-4>

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Ierapetritis, D. (2019). Discussing the role of universities in fostering regional entrepreneurial ecosystems. *Economies*, 7(4), 119. <https://doi.org/10.3390/economies7040119>

Laveren, E., Blackburn, R., Ben-Hafaïedh, C., Díaz-García, C., & Moreno, Á. (2020). An introduction to sustainable entrepreneurship and entrepreneurial ecosystems. In: Laveren, E., Blackburn, R., Ben-Hafaïedh, C., Díaz-García, C., & Moreno, Á. (eds.). *Sustainable Entrepreneurship and Entrepreneurial Ecosystems*. Edward Elgar Publishing. <https://doi.org/10.4337/9781839109690.00006>

Mitrović, S., Marić, M., Subotić, M., Dudic, B., & Greguš, M. (2019). Family entrepreneurship and personal career preferences as the factors of differences in the development of entrepreneurial potential of students. *Sustainability*, 11(20), 5693. <https://doi.org/10.3390/su11205693>

Mutanda, M., Lekhanya, L., & Moyo, S. (2018). The role of international academic professionals in the development of entrepreneurial universities in south africa: government funded universities perspective. *Journal of Economics and Behavioral Studies*, 10(5(J)), 284-296. [https://doi.org/10.22610/jebbs.v10i5\(j\).2517](https://doi.org/10.22610/jebbs.v10i5(j).2517)

Nikitina, T., Lapiņa, I., Ozoliņš, M., Irbe, M., Priem, M., Smits, M., ... & Немиленцев, М. (2020). Competences for strengthening entrepreneurial capabilities in europe. *Journal of Open Innovation Technology Market and Complexity*, 6(3), 62. <https://doi.org/10.3390/joitmc6030062>

Vavilov, S. (2018). Enabling social entrepreneurship internationally: an entrepreneurial ecosystem perspective. *Academy of Management Proceedings*, 2018(1), 17553. <https://doi.org/10.5465/ambpp.2018.17553abstract>

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Maria Lima-Toivanen	Brazil	Sustainable Innovation Technologies – Sites Ltd.	maria.limatoivanen@sites.org ; maria.limatoivanen@gmail.com
David Pace	Malta	MCAST	
Edwin Zammit	Malta	MCAST	
Ivan Briffa	Malta	MCAST	
Leonardo Piccinetti	Italy	Sustainable Innovation Technologies – Sites Ltd.	
Maria Ragia	Malta	MCAST	
Mauro Amoroso	Italy	Sustainable Innovation	

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

		Technologies – Sites Ltd.	
Pelin Uner	Malta	MCAST	

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Sustainable Entrepreneurial University: An Integrative Review

TYPE: A. original research

TRACK: “9. The role of the Entrepreneurial University and education for Future Innovators”.

PURPOSE: Universities contribute to solve sustainability challenges in the economic, environmental and social spheres. In this context, sustainable development is seen as a central line to reduce impacts on society and acts across the university's missions, namely: teaching, research and extension. Therefore, this study aims to understand how universities have approached sustainable development in the economic, environmental and social spheres and present the actions proposed by the Sustainable Entrepreneurial University (SEU) model.

DESIGN/METHODOLOGY/APPROACH:

An integrative literature review was carried out, based on Whittmore and Knafl (2005) proposal, in the *Scopus* and *Web of Science (WOS)* databases. The data was organized by articles objectives, synthesis of the used methodologies, study locations, definitions of typologies of the university models evolution, synthesis of the roles of university models, presentation of the actions of the Sustainable Entrepreneurial University model and proposal of an future studies agenda regarding the SEU model.

FINDINGS OR EXPECTED OUTCOMES: As for entrepreneurial universities, it is important to understand that they develop teaching, research, extension and self-management, being able of generating significant impacts in the environment in which they operate. Furthermore, universities in cooperation with business incubators contribute to the development of new entrepreneurs, creation of new jobs and develop products of various types, which in turn play a considerable role in the sustainable development of higher education. Therefore, economic sustainability and sustainable entrepreneurship in universities must have

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

broader initiatives beyond the campus, in order to create spin-offs and innovative startups oriented towards sustainability.

The entrepreneurial university is focused on intellectual capital and the economic line. Sustainable universities focused on environmental and economic lines. In these two models, the social line is little addressed. However, the importance of sustainability in universities has been discussed on the global stage in three areas: social, economic and environmental, mainly in innovation ecosystems. In this context, this study brought reflection on the Sustainable Entrepreneurial University model, the authors Cai and Ahmed (2021) presented a consistent discussion on university reforms and their roles in society, and for this, they presented a model of university inserted in the contexts of innovation ecosystems called Sustainable Entrepreneurial University.

ORIGINALITY/VALUE: This study brings as contributions the definitions and roles of universities in their different typologies, identification of SEU actions, which can help other university managers in the process of implementing a SEU. It was identified in this research that the relationship between entrepreneurship and sustainability still needs to be further explored, both in theoretical and practical approaches.

PRACTICAL/SOCIAL IMPLICATIONS: This study brings triple contributions, namely: practical, theoretical and social. In relation to practical contributions, it brings relevant reflections to managers on the actions that can be carried out for a university to be considered sustainable, in addition it helps politicians and university managers to understand the transition from the Entrepreneurial University to a Sustainable Entrepreneurial University, which will develop financial, environmental and social sustainability, in a transversal way, in its three missions, namely: teaching, research and extension (social involvement). As theoretical contributions, it reinforces the definitions systematization of different types of universities according to their historical evolution, reflecting on the foundations of traditional, entrepreneurial, sustainable and sustainable entrepreneurial universities. Finally, he points out social reflections on how the university starts to contribute in a sustainable way to its environment, bringing professionals and projects focused on sustainability to society, thus reinforcing the social relevance of the

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

university.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: It was identified in this research that the relationship between entrepreneurship and sustainability still needs to be further explored, both in theoretical and practical approaches. Furthermore, a clear gap was identified in the literature on the topic of Sustainable Entrepreneurial University, with only three of the 13 articles analyzed explicitly considering the topic.

KEYWORDS (3-5): Entrepreneurial University. Sustainable University. Sustainable Entrepreneurial University.

REFERENCES:

- Cai, Y. & Ahmad, I. (2021). From an Entrepreneurial University to a Sustainable Entrepreneurial University: Conceptualization and Evidence in the Contexts of European University Reforms. *High Educ Policy* 36, 20–52.
- Chais, C.; Ganzer, P. P.; Guemes-Castorena, D. & Matte, J. (2023). Universidade Empreendedora e Ambientes de Inovação: Uma análise sob a perspectiva da Sustentabilidade Econômica na Universidade de São Paulo. *Journal of Business and Management*, 25 (11).
- Fanea-Ivanovici, M. & Baber, H. (2022). Sustainability at Universities as a Determinant of Entrepreneurship for Sustainability. *Sustainability*, 14, 454.
- Karahan, M. (2024). Advancing sustainable entrepreneurial universities: sustainability transformations of university business incubators in Germany. *Small Business Economy*.
- Kundzina, L.; Rivza, B.; Grinevica, L. & Rivza P. (2023). General Fundraising Trends among University Patrons and Entrepreneurs to Promote the Sustainability of Universities. *Sustainability*. 15, 10868.
- ONU – Organização das Nações Unidas (2012). Rio+20: Statement by the Higher Education Sustainability Initiative. Available in: : < <https://unglobalcompact.org/news/248-06-20-2012>>
- Paunovic, I.; Müller, C. & Deimel, K. (2022). Building a Culture of Entrepreneurial Initiative in Rural Regions Based on Sustainable Development Goals: A Case Study of University of Applied Sciences–Municipality Innovation Partnership. *Sustainability*, 14, 12108.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Zhong, Z.; Feng, F. & Li, J. (2022) Making university and curricular sustainable entrepreneurship: a case study of Tsinghua University. *Asia Pacific Educ*, 23, 559–569.

Zunda, S.; Zeps, A. & Strode, S. (2020). Creation of a sustainable model for building and maintaining a relationship between universities and entrepreneurs. *Business, Management and Economics Engineering*, 18(1), 33-55.

Whittemore, R. & Knafl, K. (2005) The integrative review: updated methodology. *Journal of Advanced Nursing*, 52(s), 546-553.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Patrícia Kelli Silva de Oliveira	Brazil	Universidade Federal de Itajubá	patriciak@unifei.edu.br
Andrea Aparecida da Costa Mineiro	Brazil	Universidade Federal de Itajubá	andreamineiro@unifei.edu.br
Isabel Cristina da Silva Arantes	Brazil	Federal University of Itajubá (UNIFEI)	isabel.adm@unifei.edu.br
Jeniffer de Nade	Brazil	Federal University of Itajubá (UNIFEI)	jeniffer.nadae@unifei.edu.br
Juliana Helena Daroz Gaudencio	Brazil	Federal University of Itajubá (UNIFEI)	juliana.gaudencio@unifei.edu.br

XXII Triple Helix Conference – 2024

TITLE: Motivations and challenges: the endeavor of sustainable entrepreneurs

TYPE: Article

TRACK: The role of the Entrepreneurial University and education for Future Innovators

PURPOSE: The aim of this study was to investigate the motivations of sustainable entrepreneurs, focusing on the challenges in business management. To collect data, interviews were carried out with sustainable businesses in the area of the Rota Mirantes in Ibiapaba. Based on the results of the study and the information analyzed, the motivational aspects for establishing a sustainable enterprise were as follows: identification of a business opportunity and the possibility of increasing income. The lack of financial support was one of the most challenging aspects of a sustainable business when compared with traditional entrepreneurs.

DESIGN/METHODOLOGY/APPROACH: The present study consisted of a field research of an exploratory type (Gil, 2002). Regarding data analysis, qualitative and quantitative research was carried out. A survey was conducted using an open-ended questionnaire with Likert-scaled items. For the qualitative data, the semi-structured questionnaire was used to interview the sustainable entrepreneurs, which consisted of four blocks of questions with the following categories: identification and establishment of the business; business history; motivations for the enterprise; and management difficulties. The 5-point Likert scale questionnaire was used to collect the quantitative data to establish the characteristics of the interviewee's profile. The respondents chose the degree of relevance of the item in the questionnaire, in which 1 represented the characteristic as weak and 5 as strong.

After locating the businesses, 28 interviews were carried out with the entrepreneurs in the following areas: hotels, camping, flower growing, fruit growing, restaurants, solar energy equipment, parks, and inns. All interviews were recorded and then transcribed into text programs. The content analysis technique was used to analyze the data (Minayo, 2014).

FINDINGS OR EXPECTED OUTCOMES: Based on the sample collected, 37.5% of businesses were established as of 2016, which indicates the youthfulness of ventures in the area of sustainable entrepreneurship.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Regarding the roles of the interviewees, they identified themselves as: owner, administrator, or administrative manager.

The level of education of the entrepreneurs was mostly higher education (42.35%), followed by secondary education (36%) and elementary education (21.55%). According to the GEM report (2023), the rate of success of established businesses is higher among the most educated.

The reasons for starting the business included taking advantage of the privately owned land located around a public environmental park, empirical knowledge related to environmental issues, opportunity to continue the family business, or local necessity. Of the entrepreneurs interviewed, 44% stated that they had not prepared any type of business plan or strategic planning before starting the business, 38% reported that they did so later with the help of the Sebrae, and only 18% of the entrepreneurs had a business plan from start.

During the analysis of the interviews of the business entrepreneurs from the Rota Mirantes in Ibiapaba, we found that they actively participate in the decision-making actions without the need for an institution to manage the business group. The Rota Mirantes in Ibiapaba, established by the State Law No 17.596 of August 3rd, 2021 (published on August 8th, 2021), has a touristic potential in the region due to the Ubajara National Park, which has a cable car administered by the State Secretary of Tourism of Ceará.

Characteristics of entrepreneurs

Among the characteristics, the most cited were as follows: the initiative to start the business and the management of the business; creative improvements and innovation; and resilience for overcoming obstacles. These three main characteristics obtained 80% of agreement among the entrepreneurs.

Despite the heterogeneity of motivations, according to the respondents, the most important were the desire to have their own business and autonomy, identification of a business opportunity, and possibility of increasing income. During the interview, the other common answers among respondents concerning their motivation for establishing the business were: a personal preference; generating an economic impact in the area where they live; creating jobs; gaining personal experience; improving their own quality of life; and preserving and caring for the environment to reduce damage caused by human actions. Among the main aforementioned motivations, one stood out. While taking an online course on sustainability, one entrepreneur decided to start his own business as he perceived an increase in demand for sustainable businesses.

According to the interviewees, the harmonious coexistence with nature is a challenge as the tourists needs to be educated on sustainability as well as employees and the surrounding community. It should be noted that sustainable entrepreneurs differ from common entrepreneurs because their vision is focused on sustainable equilibrium by

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

reducing the environmental impact caused by their actions, generating income, and improving the community (through employment and, consequently, income).

Challenges of entrepreneurs

The lack of support from public agencies regarding the financial resources to the sector for business implementation or improvement was cited as one of the challenges related to the management of sustainable enterprises. Among all entrepreneurs, 75% of them relied on their own resources to start the enterprise.

They also stated that because they differ from traditional businesses (which generally do not offer environmental and social advantages), sustainable enterprises do not have any different bureaucratic procedures for opening and establishing the enterprise. The entrepreneurs mentioned that bureaucratic procedures should differ from traditional businesses as their enterprise will favor environmental protection in the areas where they are located. They also cited the lack of incentives for implementing the businesses, given that they have to meet the same requirements for business registration (mandatory licenses and permits).

The competition factor was one aspect that was not significant. According to the entrepreneurs, the emergence of new ventures is an important factor for boosting the business. When tourists visit the location, they usually wish to seek other businesses that offer similar activities and cultural experiences in the municipality. Thus, competition provides tourists with a range of options, as well as cultural and environmental activities, providing different experiences during their visit.

Managers stated that the search for constant improvements, investments, and innovation are important for remaining in business. Concerning business management, the interviewees stated that there is a lack of qualified labor and the tourists do not support actions aimed at preservation. These data are in agreement with the research conducted by Hoogendoorn, Van der Zwan and Thurik (2019), who argue that sustainable entrepreneurs face institutional barriers in terms of lack of financial, administrative, and information support when starting a business when compared with traditional entrepreneurs.

ORIGINALITY/VALUE: Sustainability has therefore become a global goal to be achieved by governments, private companies, the third sector and society in general, by developing sustainable procedures that carry out systematic actions that seek not only to preserve ecosystems and biodiversity, but also improve the socioeconomic conditions of the communities where the organizations are located. In the State of Ceará, this theme has been gaining importance, particularly due to the creation of tourist routes.

PRACTICAL/SOCIAL IMPLICATIONS: By analyzing the motivations and challenges of

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

entrepreneurs, it is possible to expand discussions regarding the training process of administrators and encourage studies in academia focused on sustainable entrepreneurship.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The research is only linked to one tourist route. It is suggested to expand the analysis by including existing routes in the State of Ceará in order to observe similarities related to motivations and challenges.

KEYWORDS (3-5) *Triple bottom line*, touristic route, funding

REFERENCES:

GIL, A. C. **Métodos e técnicas de pesquisa social**. São Paulo: Atlas, 2002.

MINAYO, M. C. *et al.* **Métodos, técnicas e relações em triangulação**: Avaliação por triangulação de métodos: abordagem de programas sociais. Rio de Janeiro: Editoria Fiocruz, 2014.

HOOGENDOORN, B.e & ZWAN, P. & THURIK, R. (2019). Sustainable Entrepreneurship: The Role of Perceived Barriers and Risk. **Journal of Business Ethics**. 157. 10.1007/s10551-017-3646-8.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Benedita Marta Gomes Costa	Brasil	Universidade Estadual Vale do Acaraú	marta_costa@uvanet.br
Joana Sthefanny Gomes Costa dos Santos	Brasil	Universidade Federal do Ceará	joana12costa95@gmail.com
Luiz Ayran Sousa Costa	Brasil	Faculdade Luciano Feijão	ayransousa100@gmail.com
Vinicius Tabosa dos Santos	Brasil	Universidade Federal do Ceará	viniciustabosa052@gmail.com
Felipe Estevam Costa dos Santos	Brasil	Universidade Estadual Vale do Acaraú	felipeestevam629@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: The case of STEAMLAB at the University of São Paulo: Space of Innovation in Education

TYPE: c. practical case

TRACK: 9. The role of the Entrepreneurial University and education for Future Innovators

PURPOSE: This paper presents the case of STEAMLAB, a Didactic Laboratory created at the University of São Paulo with a focus on promoting STEAM practices and active methodologies among teachers and students of the University of São Paulo, as well as among professionals in basic education. Located at the USP Innovation Center, STEAMLAB leads initiatives involving teacher training, research in STEAM Education, and hosting undergraduate and basic education students with Maker projects. STEAMLAB is a space that aims to popularize educational practices related to creativity, innovative thinking, investigative and interdisciplinary projects, using guiding technologies such as Digital Fabrication tools and open-source software and hardware resources.

DESIGN/METHODOLOGY/APPROACH: The design/methodology/approach of STEAMLAB involves creating a collaborative environment where teachers, students, and education professionals can engage in STEAM (Science, Technology, Engineering, Arts, and Mathematics) practices and active learning methodologies. This is achieved through various initiatives such as: Teacher Training: Providing workshops, seminars, and courses to help educators integrate STEAM concepts into their teaching practices; Research: Conducting studies and research projects to advance the understanding of STEAM education and its impact on learning outcomes; Project-Based Learning: Encouraging students to work on interdisciplinary projects that require critical thinking, problem-solving, and creativity; Maker Projects: Offering resources and support for students and educators to develop hands-on projects using digital fabrication tools and

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

open-source software and hardware. Technology Integration: Exploring the use of technology as a tool to enhance learning experiences and promote innovation in education.

FINDINGS OR EXPECTED OUTCOMES: The findings or expected outcomes of STEAMLAB include: Improved Teaching Practices: Teachers who participate in STEAMLAB activities are expected to incorporate more innovative and interdisciplinary approaches into their teaching, leading to enhanced student engagement and learning outcomes; Enhanced Student Learning: Students who engage with STEAMLAB projects and activities are expected to develop critical thinking, problem-solving, and collaboration skills, which are essential for success in the 21st century; Increased Interest in STEAM Subjects: By exposing students to hands-on, project-based learning experiences, STEAMLAB aims to increase students' interest in science, technology, engineering, arts, and mathematics (STEAM) subjects and careers; Research Contributions: STEAMLAB's research activities are expected to contribute to the body of knowledge on STEAM education, informing best practices and policies in the field; Community Impact: STEAMLAB's outreach efforts are expected to have a positive impact on the local community, fostering a culture of innovation and lifelong learning.

ORIGINALITY/VALUE: The originality and value of STEAMLAB lie in its comprehensive approach to promoting STEAM education. By integrating hands-on projects, teacher training, research, and community engagement, STEAMLAB offers a comprehensive framework for advancing STEAM education practices and methodologies. Furthermore, STEAMLAB's emphasis on open-source resources and digital fabrication tools makes it accessible to a wide range of educators and students, regardless of their background or resources. This approach not only promotes inclusivity but also fosters a culture of innovation and creativity among participants.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

PRACTICAL/SOCIAL IMPLICATIONS: STEAMLAB's approach to promoting STEAM education has practical and social implications that extend beyond the classroom. By integrating hands-on projects, teacher training, research, and community engagement. Practically, STEAMLAB is enhancing educational practices. Teachers who participate in STEAMLAB activities are learning new methods and strategies that can transform their classrooms. Students, in turn, are benefiting from a more engaging and interactive learning experience, which can lead to improved academic performance and future career opportunities. Socially, STEAMLAB is helping to shape the future workforce. By exposing students to STEAM concepts and activities, STEAMLAB is inspiring interest in STEM fields and preparing students for the jobs of tomorrow. This is especially important in a world where technology is advancing rapidly, and the demand for skilled professionals in STEM fields is increasing. Additionally, STEAMLAB is strengthening ties between the university and the community. Through its outreach efforts, STEAMLAB is engaging with local schools, businesses, and organizations, creating a network of support for STEAM education. This collaboration not only benefits students and educators but also has the potential to drive economic growth and innovation in the community.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Limitations of STEAMLAB may include: Resource Constraints: Limited resources, such as funding, equipment, and staff, may constrain the scale and scope of STEAMLAB programs; Accessibility: Accessibility issues, such as geographic location or transportation barriers, may limit participation in STEAMLAB programs, particularly for underserved communities.

KEYWORDS (3-5) STEAM EDUCATION; INNOVATION, CREATIVITY.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

REFERENCES

ONISAKI, Hadassa Harumi Castelo. Movimento Maker na sala de aula: orientações para o planejamento e implementação de atividades no ambiente educacional. Dissertação (Mestrado em Educação Científica Matemática e Tecnológica) - Faculdade de Educação, Universidade de São Paulo, São Paulo, 2021. doi:10.11606/D.48.2021.tde-29112021-121942. Acesso em: 01/04/2024

HATCH, Mark. The maker movement manifesto: Rules for innovation in the new world of crafters, hackers, and tinkerers. New York: McGraw-Hill Education, 2014. CLAPP, Edward P.;

JIMENEZ, Raquel L. Implementing STEAM in maker-centered learning. Psychology of Aesthetics, Creativity, and the Arts, v. 10, n. 4, p. 481, 2016.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Hadassa Harumi Castelo Onisaki	Brasil	Polytechnic School of the University of São Paulo (Poli-USP)/STEAM Lab	hadassaonisaki@usp.br
Thiago Giancoli Berto	Brasil	Polytechnic School of the University of São Paulo (Poli-USP)/STEAM Lab	thiago.gberto@gmail.com
Roseli de Deus Lopes	Brasil	Polytechnic School of the University of São Paulo	roseli.lopes@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

		(Poli-USP)/STEAM Lab	
--	--	-------------------------	--

10

Evaluating Impact and Sustainability

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

TITLE: Empowering Sustainable Innovation: A Quadruple Helix Approach

TYPE: Practical case / experience analysis

TRACK: Evaluating Impact and Sustainability

PURPOSE: The paper presents the CASI-F and BOLERO Frameworks, as practical and effective methodologies for assessing and managing Sustainable Innovations (SI) developed through projects funded by the European Union, Università degli Studi di Milano Bicocca in Italy and Futures Diamond in the UK. It aims to highlight the significance of identifying critical issues across diverse innovation sectors, stressing the transformative impact of innovations. CASI-F and BOLERO foster multi-level stakeholder engagement and provides actionable insights for sustainability-oriented actors, contributing to enhanced policy-making and innovation management through Action Roadmapping.

DESIGN/METHODOLOGY/APPROACH: The CASI project, funded by the European Commission, focused on developing CASI-F, a framework for analysing and supporting sustainable innovations across the EU. It involved action research with over 500 case studies and more than 40 pilots across sectors, employing participatory methods and engaging stakeholders through workshops and citizen panels. CASI-F integrates principles of responsible governance and employs a five-step approach, from SI assessment to management. It leverages criteria aligned with EU objectives and employs a multi-level perspective to evaluate SI impacts across various domains. The methodology involves systematic scanning and nomination of SI cases, detailed multi-criteria analysis, critical issues assessment, advice management, and action roadmapping. Continuous interaction with stakeholders and crowd-sourcing of knowledge through CASIPEDIA facilitated framework development. The BOLERO project funded by Università degli Studi di Milano Bicocca (Italy) in partnership with Futures Diamond (UK) adapted the CASI-F methodology to the needs of SMEs and Start-ups in Milano and the Lombardian Region.

FINDINGS: CASI-F identifies SI as changes leading to positive environmental, economic, and social transformation without compromising future generations. It supports seven innovation types, emphasising the importance of *Product, Service, Organisational, Marketing, Governance, Social, and System* innovations. The methodology maps innovations, policies, and aspirations towards sustainability, utilising 44 qualitative indicators to evaluate SI impacts. Analysis of over 1300 experts informed framework development, highlighting the need for integrating sustainability into innovation processes. CASI-F and BOLERO's adaptability is showcased through its incorporation into follow-up projects, indicating ongoing relevance and potential refinement.

ORIGINALITY: The paper contributes to sustainable innovation literature by presenting CASI-F and BOLERO, as comprehensive frameworks developed through extensive research and stakeholder engagement. It offers a systematic approach to assess and manage SI across sectors, emphasising the importance of integrating sustainability principles throughout the innovation value chain. CASI-F and BOLERO's multi-level perspective and adaptable methodology provide valuable insights for policymakers, businesses, researchers, educators, and civil society actors, facilitating informed decision-making and fostering sustainable innovation ecosystems.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

PRACTICAL/SOCIAL IMPLICATIONS: CASI-F and BOLERO offer practical implications for stakeholders involved in sustainable innovation initiatives. It provides a structured approach for assessing and managing SI, aiding decision-making across multiple levels and sectors. By fostering multi-level stakeholder engagement and incorporating sustainability principles, CASI-F and BOLERO support the development of innovative solutions to societal challenges. The framework facilitates collaboration among government, business, academia, and civil society, promoting mutual learning and adaptation. Its application in diverse contexts and sectors, as demonstrated by pilot studies and follow-up projects, underscores its versatility and wide adoption potential. CASI-F and BOLERO's emphasis on responsible governance and multi-systemic impact-oriented criteria aligns with global sustainability agendas, making it a valuable tool for advancing sustainable development goals.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: Further research could explore the long-term impacts and scalability of CASI-F and BOLERO in promoting sustainable innovation ecosystems. Limitations include the need for ongoing refinement and validation of the framework, as well as potential challenges in ensuring stakeholder engagement and data availability. Future studies could investigate the application of CASI-F and BOLERO in different geographical and sectoral contexts, examining its effectiveness in addressing emerging sustainability challenges. Additionally, efforts to enhance the accessibility and usability of CASI-F tools and resources could improve its uptake and impact. Despite these limitations, CASI-F and BOLERO represent a significant advancement in sustainable innovation research and practice, offering valuable insights and methodologies for addressing complex societal challenges.

KEYWORDS (3-5)

Sustainable Innovation, Sustainability Assessment, Innovation Management, Foresight, Action Roadmapping

REFERENCES

- Carayannis, E.G. and Campbell, D.F.J. (2009). 'Mode 3' and 'quadruple helix': toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management* 46 (3-4), pp. 201-234.
- Carayannis, E.G. and Campbell, D.F.J. (2010). Triple helix, quadruple helix and quintuple helix and how do knowledge, innovation and the environment relate to each other? A Proposed framework for a trans-disciplinary analysis of sustainable development and social ecology. *International Journal of Social Ecology and Sustainable Development* 1 (1), pp. 41-69.
- CASIPEDIA (2017). State-of-the-Art of Sustainable Innovation Database. [Online]. CASI Work Package led by The University of Manchester, CASI project. Available at <http://www.futuresdiamond.com/casi2020/casipedia/>
- European Commission (2009). 'Impact Assessment Guidelines', SEC(2009) 92, 15.1.2009.
- Flanagan, K., Uyarra, E., Laranja, M. (2011) Reconceptualising the 'policy mix' for innovation. *Research Policy*, 40, pp. 702-713.
- Geels, F. (2004b). From sectoral systems of innovation to socio-technical systems Insights about dynamics and change from sociology and institutional theory. *Research Policy* 33, pp. 897-920.
- Hacking, T. and Guthrie, P. (2008). A framework for clarifying the meaning of triple bottom-line, integrated and sustainability assessment. *Environmental Impact Assessment Review*, 28 (2-3) (2008), pp. 73-89.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

Köhler, J., Geels, F. W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M., Nykvist, B., Pel, B., Raven, R., Rohracher, H., Sandén, B., Schot, J., Sovacool, B., Turnheim, B., Welch, D., Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental innovation and societal transitions*, 31, 1-32.

Martini, M., Holsgens, R., Popper, R. (2020), editors, *Governance and Management of Sustainable Innovation: Learning from Experience to Shape the Future*, Springer.

Martini, M., Marafioti, E., Carminati, M. (2020) Exploring the Role of Stakeholder Engagement for the Development of Sustainable Innovation Strategies, in Martini, M., Holsgens, R., Popper, R. (2020), editors, *Governance and Management of Sustainable Innovation: Learning from Experience to Shape the Future*, Springer.

OECD (2005). *Guidelines for Collecting and Interpreting Innovation Data. Oslo Manual 3rd Edition*. Paris: Organisation for Economic Co-operation and Development.

Pajula, T., Popper, R., (2020) Towards a Hybrid Framework for Sustainable Innovation, in Martini, M., Holsgens, R., Popper, R. (2020), editors, *Governance and Management of Sustainable Innovation: Learning from Experience to Shape the Future*, Springer.

Pinkse, J. (2019). Firms, institutions and politics: the role of corporate political activity in sustainable innovation, in Boons, F. and McMeekin, A., *Handbook of Sustainable Innovation*, Edward Elgar, Cheltenham.

Popper, R. (2008). Foresight Methodology, in Georghiou, L., Cassingena H., J., Keenan, M., Miles, I., and Popper, R., *The Handbook of Technology Foresight: Concepts and Practice*, Edward Elgar, Cheltenham.

Popper, R., Popper, M. and Velasco, G. (2017). Towards a Responsible Sustainable Innovation Assessment and Management Culture in Europe, *Engineering Management in Production and Services*, 9(4).

Popper, R., Popper, M., Velasco, G. (2020) Sustainable Innovation Assessment and Management Framework: Principles, Methodology and Practice, in Martini, M., Holsgens, R., Popper, R. (2020), editors, *Governance and Management of Sustainable Innovation: Learning from Experience to Shape the Future*, Springer.

Velasco, G., Popper, M., Popper, R., (2020) An Inductive and Multidimensional Approach to Sustainable Innovation: Evidence from Multiple Case Studies, in Martini, M., Holsgens, R., Popper, R. (2020), editors, *Governance and Management of Sustainable Innovation: Learning from Experience to Shape the Future*, Springer.

CONTACT INFO

NAME & SURNAME	COUNTRY	ORGANIZATION	EMAIL
Rafael Popper	Poland	Warsaw University of Technology	Rafael.Popper@pw.edu.pl
Monika Popper	UK	Futures Diamond Ltd	Monika.Popper@futuresdiamond.com
Guillermo Velasco	Spain	Universidad Politécnica de Madrid	guillermo.velasco@upm.es
Mattia Martini	Italy	Università degli Studi di Milano Bicocca	mattia.martini1@unimib.it
Angela Rizzo	Italy	Università degli Studi di Milano Bicocca	angela.rizzo@unimib.it

TITLE: An analysis of efficiency and technical progress on public health services in the State of Amazon

TYPE (a. original research)

TRACK: (Track 10)

PURPOSE: Innovations and improvements in efficiency and productivity in public health services are of great importance to boost the diffusion, quality and effectiveness of the provision of these services, generating major impacts for the population, given limited public resources.

The objective of the study was to evaluate the impact of improvements in health systems in Amazonian municipalities in the period from 2010 to 2014 using quantitative data analysis models of the evolution of technological progress and efficiency levels among 56 Amazonian municipalities. Such models analyze multiple inputs and outputs of the Health Units and seek to map the evolutions in the levels of efficiency and productivity (catch-up effects) of the units as well as evolutions in the technological progress (frontier-shift effects) of the health units within the municipalities analyzed.

DESIGN/METHODOLOGY/APPROACH:

The models used as resources or input variables the resources and financial funds allocated to municipalities by the federal government in transfers to primary care and pharmaceutical assistance, human resources and the entire workforce involved with health activities in the municipality (doctors, nurses, nursing assistants and community health agents) as well as the infrastructure used to provide health services. The benefits or output variables considered were the number of home visits carried out by doctors, nurses and/or community health agents, the number of medical consultations and individual care by nurses, the municipality's outpatient production, the percentage of hospitalizations that could be assertively identified and predicted by municipal health systems and the percentage of children with normal birth weight. For the development of the research, secondary data collected in the databases of the Department of Informatics of the Unified Health System (DATASUS), the Brazilian Institute of Geography and Statistics (IBGE) and also the financial data of the municipalities from the National Fund of Health (FNS).

To implement the analyzes, the study employed Data Envelopment Analysis (DEA) methodology with variable returns to scale (Variable Returns to Scale – DEA/ VRS approach) with output orientation, considering that public health services seek offering as many products and services as possible, given certain budget constraints. To obtain an assessment of the evolution of technological progress and the performance of efficiency and productivity in public health services in municipalities throughout the analyzed period, the Malmquist index was developed in order to compare the performance of units providing health services from one year to the next, based on the assessment of technological advances at the frontier (frontier-shift effect) and the technical efficiency change index (catching-up effect), which maps the evolution of

efficiency in the provision of health services between two subsequent periods. The Malmquist indices were obtained from the development of the modeling in version 2.1 of the Data Envelopment Analysis Program (DEAP) and the results analyses were developed in the software SPSS (version 20) and STATA (version 16).

FINDINGS OR EXPECTED OUTCOMES:

Among the main results, the research shows a discreet trend, in average terms, of growth in technological progress (frontier-shift effects) more specifically between 2012 and 2014 and, on the other hand, a discreet trend of increase in efficiency and productivity (catching-up effects) in the provision of public health services for a large part of the municipalities over the years 2010 to 2012, and also presents individual results, that is, the efficiency indices and technological advances in the provision of health services for each municipality. The research also carried out a benchmarking analysis considering the group of municipalities with the highest levels of technical efficiency as those to be followed to achieve improvements in productivity and the results of the study show that the least technically efficient municipalities should increase, on average, around 30% both the number of home visits carried out by doctors, nurses and/or community health agents and the number of consultations medical care and individual care by nurses, and also the municipality's outpatient production, as well as around 12%, on average, the percentage of hospitalizations that were identified and predicted by the health systems, and about 3% the percentage of children with normal weight at born with the objective of achieving high levels of efficiency as the most productive municipalities regarding to the provision of public health.

ORIGINALITY/VALUE:

The work develops a study of technical efficiency and technological progress comparing 56 amazonian municipalities to achieve a better understanding about the best practices to managing public health services.

PRACTICAL/SOCIAL IMPLICATIONS:

The research presents a managerial contribution to developers and practitioners of public health policies towards a better understanding of which resources management should focus on in order to improve technical efficiency in the results of public health activities

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS:

Next research could study the impact of intensifying digitalization on health service processes as well as the use of new technologies such as artificial intelligence algorithms and analytics tools as queueing theory and simulation, linear, nonlinear and integer programming, logit analysis, neural networks and balancing and sequencing procedures.

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

KEYWORDS (3-5)

Public health services; efficiency and productivity; technical progress

REFERENCES

- Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision making units. *European Journal of Operational Research*, 2(6), 429–444. doi: 10.1016/0377-2217(78)90138-8
- CONASS. (2015). A Gestão do SUS. In Para entender a Gestão do SUS. Brasília - DF: Conselho Nacional de Secretários de Saúde - CONASS.
- Odone, A., et al. (2019). Public health digitalization in Europe: *EUPHA vision, action and role in digital public health, European Journal of Public Health*, Volume 29, Issue Supplement_3: 28–35, <https://doi.org/10.1093/eurpub/ckz161>
- Gopal, G. et al. (2019). Digital transformation in healthcare – architectures of present and future information technologies. *Clinical Chemistry and Laboratory Medicine (CCLM)*, vol. 57, no. 3: 328-335. <https://doi.org/10.1515/cclm-2018-0658>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate Data Analysis*. Uppersaddle River.
- Liu, N. (2016). Optimal choice for appointment scheduling window under patient no-show behavior. *Production and Operations management*, 25, 128-142. <https://doi.org/10.1111/poms.12401>
- MS, M. da S., & OPAS, O. P. A. de S. (2013). Financiamento Público de Saúde. In *Economia da Saúde para a Gestão do SUS*. Brasília - DF.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL

Roseani Pereira Parente Brazil UEA rparente@uea.edu.br

Alceu Salles Camargo Jr. Brazil FEA/USP alceu@usp.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: University, business, and technology: a case study of implementing a junction approach

TYPE (a. original research)

TRACK: Sustainable development

PURPOSE: The implementation of the 17 Sustainable Development Goals (SGDs) is a global-scale aim to promote regional and local support for people and environment, with adhesion of most of countries worldwide (UN, 2015). The 2030 Agenda was design as a plan for prosperity for all in the planet, favoring dignity and peace in the most spatial scales of approach. Brazil is an important actor in the international discussions of global development and sustainable, including climate change and its impact on people. The main aim of this work is to approximate the triad university (academy), business (industry), and technology, in ways to provide a better dialogue and development for all.

DESIGN/METHODOLOGY/APPROACH: The methodology here includes a design of concepts in an approach of dialogue with the Sustainable Development Goals (SGDs) to be achieved the main peace goals intentions of the 2030 Agenda as soon as possible, promoted by the United Nations. This paper was designed with the knowledge acquired during the academy (university) course and postgraduate studies. The main intentionality here in this paper is to present the compromise assumed by the country to advance and promote advances in the 17 SGDs and its social function to increase the quality life of the population and attend the goals of nature equilibrium.

FINDINGS OR EXPECTED OUTCOMES: The discussions here presented are an incentive to better increase the applicability, and applies, of the SGDs (UN, 2005), in ways to promote advances in the triad university (academy), business (industry), and technology. There is many non-governmental institutions that are compromised in contribute with the national and global development, as the Alok's Institute, that

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

performs actions in ways to include people in vulnerable situation, especially with the dignity access of technology, mainly, in the most distant and inaccessible rural situation.

ORIGINALITY/VALUE: The paper here implies in to present the work developed at the mouth of the Amazon River, located in the the Amazonia drainage system (Brazil), nominee Marajo Island archipelago, between the cities of Belém and Macapá, Pará and Amapá state, respectively. The researchers published intituled “Soils and landscapes of Marajó island, Brazilian Amazonia: Holocene evolution, geoarchaeology and climatic vulnerability” (Henriques et. al, 2022), and “Impacts of anthropocene sea-level rise on people, environments, and archaeological sites in Marajó Island, Brazilian Amazonia” (Henriques et. al, 2024), had the purpose to present the social and ecological situations of one of the most extensive and environmental complex fluvio-marine archipelagos on the planet, with more than 7500 km. The scientific researchers published contributed with the originality value of present, mainly, the possible scenarios of climate change in the island, that has potential to directed affect people and their houses and way of life in the island.

PRACTICAL/SOCIAL IMPLICATIONS: The applicability of the triad university, business, and technology can provide better access of dignity for people in its cities worldwide, contributing with sustainable development and environmental equilibrium of ecosystems. The main purpose of the 17 sustainability development goals is to boost and encourage all the nations to adopted governments actions that promote inclusion for people and dignity access to technology and knowledge education.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: The advances in the approximation of university, business and technology for better development and sustainability depends on multiple sectors of interesses, as managers, students, government resources, scientists, public figures, and others. The first challenge is in the diagnosis of the most vulnerable sector of the civilization, as schools with precarious structure, poor access to dignity alimentation, the areas of higher concentration of unemployment in the society. The climate change discussions are also an important component of challenge in the applicability of the triad (academy, industry, and technology), that needs to be better understood. Many scientific studies are development in the academic universities, with high potential to be directed applied in the

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation: Connecting Smart Talent and Disruptive Technologies for a Better Tomorrow

society in order to achieve better sustainability and environmental dynamic balance with the ecosystems.

KEYWORDS (3-5) Technology access, climate change; regional development, Sustainable Development Goals, applied research.

REFERENCES

Henriques, R.J., de Oliveira, F.S., Schaefer, C.G.R. et al. Soils and landscapes of Marajó island, Brazilian Amazonia: Holocene evolution, geoarchaeology and climatic vulnerability. *Environ Earth Sci* 81, 254 (2022). <https://doi.org/10.1007/s12665-022-10310-2>

Henriques, R.J., de Oliveira, F.S., Schaefer, C.G.R. et al. Impacts of anthropocene sea-level rise on people, environments, and archaeological sites in Marajó Island, Brazilian Amazonia, *Journ of South Americ Earth Sci* 136, 104836 (2024). <https://doi.org/10.1016/j.jsames.2024.104836>.

UN. United Nations; Transforming our world: the 2030 Agenda for Sustainable Development, 1, 41p. (2015). <https://sdgs.un.org/publications/transforming-our-world-2030-agenda-sustainable-development-17981>.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Renata Jordan Henriques	Brazil	UFMG	renatajhques@gmail.com

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:
Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

XXII Triple Helix Conference – 2024

Papers should be submitted as extended abstracts (**minimum 500 words, maximum 1000 words**)

TITLE: The fostering innovation in the Universidade Federal do Recôncavo da Bahia (UFRB) influence's area: a Triple Helix Analytical Model

TYPE: a. original research

TRACK: 10. Evaluating Impact and Sustainability: Impact assessment methodologies and indicators

PURPOSE: The purpose of this research is to critically analyze the role of the Triple Helix agents (University - Company - Government) in fostering innovations within municipalities that host campuses of the Federal University of Recôncavo da Bahia (UFRB). The primary objective is to identify the performance indicators of the Triple Helix and to understand the significance of a knowledge-based economy for local development. This research aims to contribute to the existing body of knowledge by providing insights into the dynamics of innovation ecosystems and their impact on local development.

DESIGN/METHODOLOGY/APPROACH: This research adopts an applied approach, with a constructivist lens focused on Max Weber's concept of the ideal type. The methodology involves a deductive approach using both qualitative and quantitative data, characterized by its exploratory and descriptive nature. The Triple Helix model is used as an ideal type model for fostering innovation, which is expected to lead to local development. The Content Analysis method, as proposed by Laurence Bardin (1977), is employed to structure the model and organize the indicators of each agent of the Triple Helix. The combination of Weber's Ideal-Type method and Content Analysis, applied to the theoretical context of the Triple Helix, provides a new research tool: Methodological Benchmarking. This allows for the identification and comparison of the performance indicators of the Triple Helix, as well as the identification and planning of necessary actions by the agents, with the aim of promoting the fostering of innovations and, consequently, resuming the process of local development.

FINDINGS OR EXPECTED OUTCOMES: The research confirmed the hypothesis that since the inception of UFRB's activities in 2005, there has been a lack of articulation between the agents of the Triple Helix aimed at fostering innovation. Consequently, this has impacted the local development of the municipalities that host its campi. This finding underscores the need for a more integrated approach to innovation, involving all stakeholders of the Triple Helix, to drive local development.

ORIGINALITY/VALUE: The originality of this research lies in its unique approach of using the Triple Helix as a theoretical framework to develop innovation indicators. Furthermore, the use of the Content Analysis method to conduct a comparative study between the Federal University of São Carlos (UFSCar) and UFRB adds value to this research. UFSCar is used as a reference model in accordance with Max

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Weber's Ideal Type method, given its prominence and relevance among universities established in multicampus systems in interior municipalities.

PRACTICAL/SOCIAL IMPLICATIONS: The results of this research have significant practical and social implications. They can help inform policies and practices to improve the articulation between universities, companies, and government in fostering innovation and local development. By identifying the gaps and opportunities in the current innovation ecosystem, this research can guide stakeholders in making informed decisions that can drive local development.

DIRECTIONS FOR FURTHER RESEARCH/LIMITATIONS: This research has some limitations, including its focus on only two universities and its reliance on publicly available data. Future research can expand this work by exploring the performance of the Triple Helix in other universities and regions, and by using more comprehensive data collection methods. Additionally, future research may seek to further develop and validate the performance indicators of the Triple Helix identified in this research. This would contribute to a more robust understanding of the dynamics of innovation ecosystems and their impact on local development.

KEYWORDS (3-5): Triple Helix; Innovation; Local Development; UFRB; UFSCar.

REFERENCES:

BARDIN, L. **Análise de conteúdo**. Lisboa: Edições 70, 1977.

ETZKOWITZ, H. **Hélice Tríplice: Universidade – Indústria – Governo. Inovação em movimento**. Porto Alegre: EDIPUCRS, 2013.

LEYDESDORFF, L. The triple helix, quadruple helix, and an N-tuple of helices: explanatory models for analyzing the knowledge-based economy? **Journal of the knowledge economy**, v. 3, n. 1, p. 25-35, 2012.

UFRB. **Site Institucional**. Disponível em: <https://ufrb.edu.br/portal/>. Acesso em: 15 jun. 2022.

UFSCar. **Site Institucional**. Disponível em: <https://www.ufscar.br/>. Acesso em: 15 jun. 2022.

WEBER, M. La objetividad del conocimiento propio de las ciencias sociales y de la política social. **Revista de Economía Política**, n. 16, 1956.

CONTACT INFO

NAME AND SURNAME	COUNTRY	ORGANIZATION	EMAIL
Leila Cristina da Silva Oliveira	Brazil	UNIFACS	leilacris@gmail.com
Amilcar Baiardi	Brazil	UCSAL	Amilcar.baiardi@pro.ucsal.br

Triple Helix & ACEEU CONFERENCE 2024

Triple Helix and Impact Innovation:

Connecting Smart Talent and Disruptive Technologies
for a Better Tomorrow

Ricardo Daher Oliveira	Brazil	UNEB	ricardo.daher@hotmail.com
------------------------	--------	------	---------------------------

An aerial night view of a city, likely San Francisco, with numerous lights from buildings and streets reflecting on the water in the foreground. The sky is dark with some light clouds.

11 AWARDS

2024
People Helix & ACEEU
CONFERENCE

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Award Committee

Dr. Marcelo Amaral
Dr. Josep M. Piqué
Dr. Yuzhuo Cai

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Conference Paper Award

THIRD PLACE

**Building Innovative Universities: a new
framework for Dynamic Capabilities in
Open Innovation.**

Author:

Rafael Monnerat

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Conference Paper Award

SECOND PLACE

Startups Strategies for Impactful
Innovation: How Open Innovation
Influences Product and Services Innovation
and Organizational Performance on
Brazilian startups.

Authors:

*Bianca Carvalho da Silva, Ana Clara Berndt,
Giancarlo Gomes.*

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Conference Paper Award

WINNER

University-industry interaction channels in dynamic environments: a framework proposed inspired by the UFRJ Science Park.

Authors:

Kelyane Silva; Lydia Bares; Thiago Negrão Chuba; Vicente Antonio de Castro Ferreira

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Early Career Researcher

THIRD PLACE

**Interplay between ecosystem types: review
and agenda for future research.**

Authors:

Diogo Barbosa Leite; Sílvio Luís de Vasconcellos.

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Early Career Researcher

SECOND PLACE

**Innovation in public contracts: an analysis
of implementation in brazilian states.**

Authors:

Izabel Sabino de Sousa; James Batista Vieira.

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Early Career Researcher

WINNER

Integrated management model of
intermediaries for technology transfer.

Authors:

Renan Rocha; Alexandre Dias

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Poster Award

THIRD PLACE

Entrepreneurial universities in the context of a small country: Lessons learned and impact on innovation ecosystem.

Authors:

Maria Lima-Toivanen, David Pace, Edwin Zammit, Ivan Briffa, Leonardo Piccinetti, Maria Ragia, Mauro Amoruso, Pelin Uner.

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Poster Award

THIRD PLACE

The innovation diplomacy and the integration of innovation ecosystems based on green hydrogen.

Authors:

Victor Hugo José de Santana Rezende.

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Poster Award

SECOND PLACE

How Foresight and Horizon Scanning Shape
Emerging Technologies and Disruptive
Innovations Research?

Authors:

Rafael Popper.



Best Poster Award



The protection of intellectual property rights in the Legal Framework for Innovation.

Authors:

Juliano Costa, Leticia Pavanatte.



Best Practical Case



Innovating for Tomorrow: Educational, Social, and Environmental Initiatives of tecnoPARQ Social as Engines of Transformation.

Authors:

Caroline Carvalho, Nathália Gomes; Vinícius Sales; Claudinei Heleno; Juscelia Lopes; Francilara Castro; Adriana Faria; Lara Corrêa; Arthur Martino; Yasmin da Silva.



Best Practical Case



Communication and Marketing Strategies for University – Company - Society Interaction: A tecnoPARQ Case Study.

Authors:

Laísse Nicácio; Andressa De Battisti; Enya Chaves; Daiana Quirino; Francylara Castro; Jucélia Roberto; Adriana Faria.

TRIPLE HELIX & ACEEU CONFERENCE

São Paulo

Triple Helix and Impact Innovation:
Connecting Smart Talent and
Disruptive Technologies for a Better
Tomorrow

JUNE 19-21, 2024



Best Practical Case

WINNER

Collaborative strategy for innovation: a case study of the Innovation Link program from tecnoPARQ/UFV

Authors:

Luciana Ramos Soares; Daiana Francisca Quirino; Mônica Santana Moreira; Jucélia Maria Lopes Maia Roberto; Adriana Ferreira de Faria.

Best Poster Award

The protection of intellectual property rights
in the Legal Framework for Innovation.

Winner



Juliano Costa, Leticia Pavanatte

A stylized signature consisting of a horizontal line and two vertical lines intersecting.

Josep M. Piqué
President of Triple Helix Association



Best Practical Case

Collaborative strategy for innovation: a case study of the Innovation Link program from tecnoPARQ/UFV

Winner



*Luciana Ramos Soares; Daiana Francisca Quirino;
Mônica Santana Moreira; Jucélia Maria Lopes
Maia Roberto; Adriana Ferreira de Faria.*

A stylized signature consisting of a horizontal line and two vertical lines intersecting.

Josep M. Piqué
President of Triple Helix Association



Best Practical Case

Communication and Marketing Strategies for
University – Company - Society Interaction:
A tecnoPARQ Case Study.

Second Place



*Laísse Nicácio; Andressa De Battisti; Enya
Chaves; Daiana Quirino; Francylara Castro;
Jucélia Roberto; Adriana Faria.*

A stylized signature consisting of a horizontal line and two vertical lines intersecting.

Josep M. Piqué
President of Triple Helix Association

 **TRIPLEHELIX**

Best Practical Case

Innovating for Tomorrow: Educational, Social,
and Environmental Initiatives of tecnoPARQ
Social as Engines of Transformation.

Third Place



*Caroline Carvalho, Nathália Gomes;
Vinícius Sales; Claudinei Heleno; Juscelia Lopes;
Francilara Castro; Adriana Faria; Lara Corrêa;
Arthur Martino; Yasmin da Silva.*

A stylized, handwritten signature in black ink, consisting of a horizontal line and two vertical lines intersecting at a point.

Josep M. Piqué
President of Triple Helix Association

 **TRIPLEHELIX**

An aerial night view of the São Paulo skyline, showing a dense cluster of illuminated skyscrapers and buildings against a dark sky. The city lights create a vibrant, colorful pattern of yellow, orange, and blue.

2024 Triple Helix & ACEEU CONFERENCE

São Paulo

**Triple Helix and
Impact Innovation:**

Connecting Smart Talent
and Disruptive Technologies
for a Better Tomorrow

June 19-21, 2024