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# Entrepreneurship network in the post COVID-19 era

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## ABSTRACT

As of March 2024, the pandemic has limited opportunities for entrepreneurs. The objective of the study was to establish the networks of opportunities, motives, dispositions, ethics, pressures, challenges, reputation, images, identities and behaviors related to entrepreneurship in the face of the health and economic crisis. A documentary, cross-sectional and exploratory study was carried out with a selection of sources indexed to international repositories: Scopus, JCR, WoS, Latindex, Redalyc, Scielo and Frontiers. A search was made for the keywords of opportunism, optimization, innovation and entrepreneurship. The summaries corresponding to the pandemic period from November 2019 to March 2024 were considered. A structure of relationships between nodes and edges was found that suggests a neuronal learning that went from the dimension of pressure in the face of the pandemic to entrepreneurial identity. The centrality parameters that measure the distance between edges and nodes suggest that the dispositions are structured according to this principle of proximity. The grouping coefficients that indicate the structuring of the edges and nodes according to their dimensions suggest that the network is reconfigured from process innovation and resources optimization. The structure measure reflects the pressure concentration as the network input and the identity dimension as the network output. The centrality parameters that measure the distance between edges and nodes suggest that the dispositions are structured according to this principle of proximity. The grouping coefficients that indicate the structuring of the edges and nodes according to their dimensions suggest that the network is reconfigured from process innovation and recursion optimization. The structure measure reflects the pressure concentration as the network input and the identity dimension as the network output. In this way, the present study found a central and grouped structure in two dimensions of pressure and identity of entrepreneurship in the face of COVID-19 Delimitation to three dimensions of analysis corresponding to opportunities, optimizations and innovations is recommended.

**KEYWORDS:** COVID-19, Internet, Trolling, Stalking, Stashing, Texting, Bullying

## INTRODUCTION

The period of the pandemic that runs from November 2019 to May 2024 has caused a health, economic and social crisis with effects on entrepreneurship (Barroso et al., 2020). The anti-COVID-19 policies, the mitigation and containment strategies, as well as the distancing and confinement programs were aimed at the financial rescue of working families rather than the financing of micro, small and medium-sized enterprises (Morched et al., 2021). Thus, the impact of the pandemic on entrepreneurship opportunities has been a central issue on the local agenda (Khan et al., 2022). The literature from 2019 to 2022 on entrepreneurship suggests a network structure between nodes and edges on the opportunities that the pandemic opened up for the discussion of entrepreneurship as a response to the health, economic and social crisis (Najeh & Morched, 2022).

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The theoretical, conceptual and empirical frameworks that explain entrepreneurship suggest that in a crisis scenario it emerges as a common response in the affected localities (Aqmala & Putra, 2021). In the case of the theory of demands and resources, the pandemic meant a challenge that had to be counteracted with the optimization of resources (Miah, 2021). However, the theory of complex institutions ensures that entrepreneurship is the product of strategic alliances between political and social actors, as well as the public and private sectors (Setyanti, 2021). In this way, the demands and resources are combined with the autonomous institutions in the face of crises (Saha & Jannat, 2021).

As for the studies on entrepreneurship focused on emerging organizations, the opportunities determine the optimization of resources and process innovation (Tasnim & Wuryani, 2021). The literature from 2019 to 2024 suggests that stigma is the mediating factor of the variables related to entrepreneurship (Iman et al., 2021). Stigma regulates entrepreneurial decision-making (Maldonado et al., 2021). In high-risk scenarios, stigma inhibits resource management, but in scenarios of trust, it activates investment in companies that adjust their protocols to biosafety or accident and disease prevention (Perdana, 2021).

However, the models that have shown the relationships between the variables do not include the possible interactions that allow us to see a general panorama of entrepreneurship in a scenario and period of crisis (Reavis et al., 2021). The theoretical, conceptual and empirical models assume that the demands and resources, as well as the complexity of the organizations are instances where asymmetries are appreciated, but possible scenarios of improvement are not observed (Da Rosa et al., 2021).

The objective of the present study was to reveal the structure of entrepreneurship networks published in the international literature during 2019 to 2024.

Are there significant differences between the structure of opportunity networks with respect to the structure observed, analyzed and discussed in the present work related to entrepreneurship?

The premises that guide this work suggest that the pandemic limited entrepreneurial opportunities and opened up process innovations, as well as resource optimization (Sidrat & Boujelbene, 2022). Mitigation and containment strategies, as well as distancing and confinement programs, were intensified as financing for companies was reduced (Tandoh et al., 2022). Therefore, the differences between the theoretical structure and the observed network will open the discussion about the pandemic and its effects on the reactivation of the economy (Wasim & Rehman, 2022).

## METHOD

This work is documentary cut since studies from 2019 to 2024 search criteria keywords are reviewed; "Entrepreneurship", "innovation", "utility", "support", "ease" or "accessibility" in three search engines: Scopus, JCR, WoS, Latindex, Redalyc, Scielo and Frontiers.

The Systematic Review Inventory was used (see Annex A), which includes questions related to the concepts of entrepreneurship and COVID-9, considering the criteria and evaluations of expert judges on both topics.

Delphi technique was used to establish relationships paths dependence between factors advanced in the theoretical, empirical and conceptual frameworks are the hypotheses for contrasting scenarios according to literature. Based on the criteria and qualifications of the judges, the selected articles were coded considering a Likert-type scale that goes from 0 = "not at all likely" to 5 = "quite likely". The data was captured in excel and processed in JASP version 15.0

Non-parametric statistical values were obtained in order to establish the centrality and grouping of the selected findings. Next, the relationships between the extracts were estimated in order to establish the revised knowledge network in the literature. The neural network equation was followed because they explain the learning of a network of knowledge such as entrepreneurship before COVID-19.


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## RESULTS

The centrality analysis establishes the degrees of profusion, proximity, intermediation and influence between the nodes in order to reveal the hub or main node (see Fig. 1). The results show that the ipe node (attitude towards the pandemic) prevails over the other nodes.

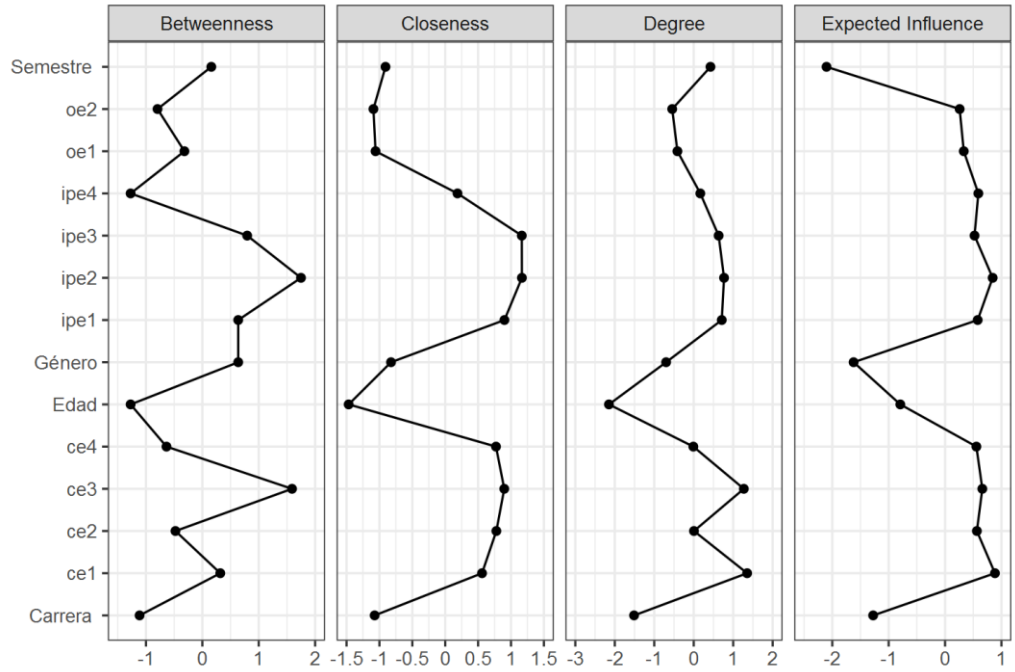


**Fig. 1. Entrepreneurship centrality**

The clustering analysis suggests the degree of connectivity between the nodes in order to establish the hub or regulatory node (see Fig. 2). The results warn of the prevalence of entrepreneurial challenges.

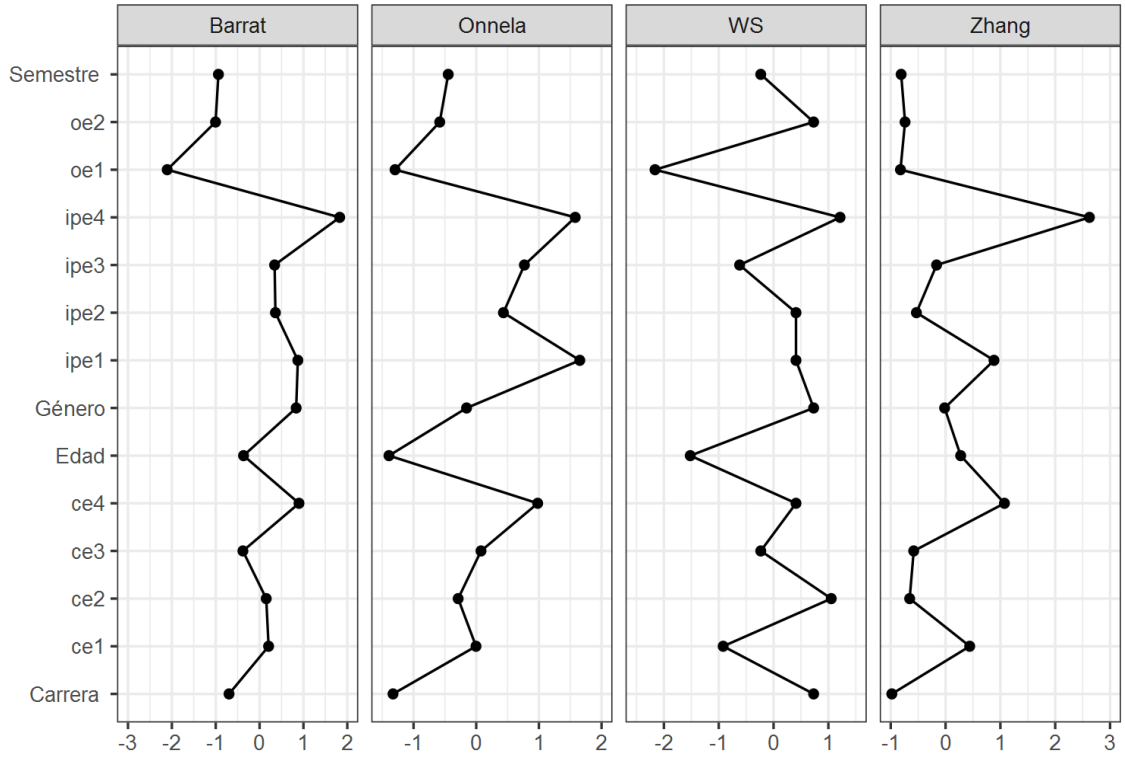


**Fig. 2. Entrepreneurship group**

The structural analysis suggests the degree of learning between the nodes with respect to the entrepreneurial


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process established from the main entry node, the central nodes and the final node (see Fig. 3). The findings suggest that resolution and entrepreneurial projects are regulated by the attitude and challenges faced by the pandemic.

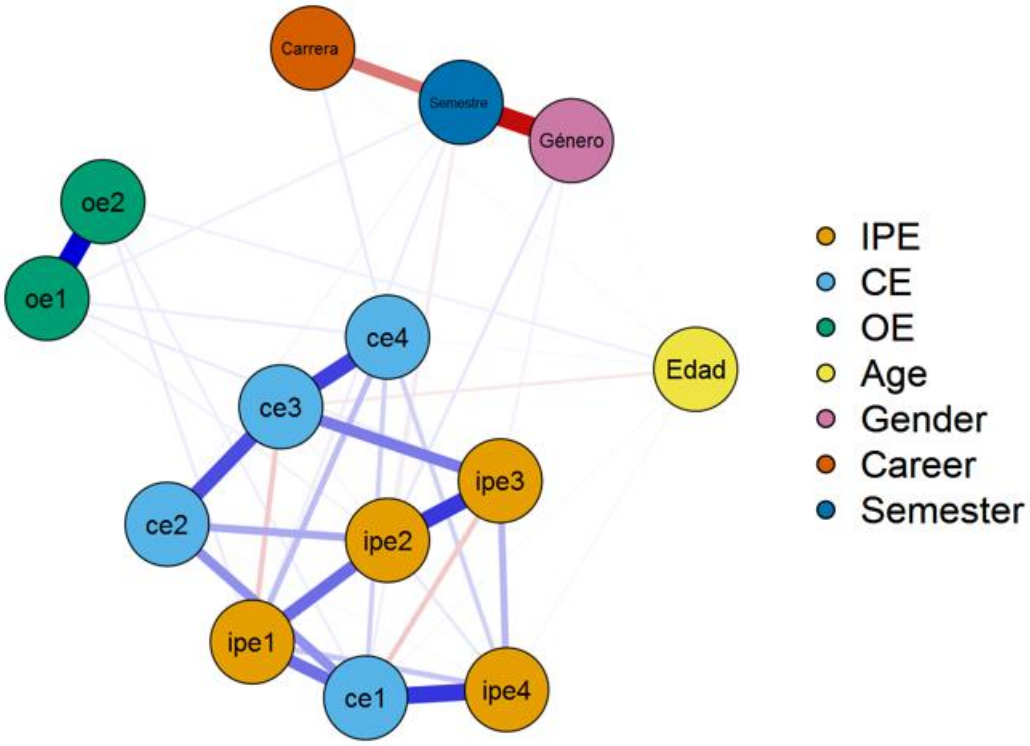


**Fig. 3. Entrepreneurship structure**

The values of centrality, grouping and structuring suggest the nor rejection of the hypothesis related to the differences between the theoretical structure with respect to empirical observations.

## DISCUSSION

The contribution of this work to the state of the art consists in the establishment of a model of entrepreneurship networks based on the findings of the literature from 2019 to 2024. A network was found that indicates the inclusion of multiple dimensions which, when interacting, are structured. in an entry of dispositions to the demands and an exit of entrepreneurial identities such as optimism (Silva et al., 2021). In relation to entrepreneurship studies where resource optimization and process innovation stand out as central axes of local entrepreneurship, this study warns that these two dimensions are diversified. The optimization of resources is related to the image, identity and reputation of the organization. Innovation is more closely linked to entrepreneurial dispositions motivated by the crisis. In this way, the structure of the analyzed findings seems to indicate that the relations between the rulers and the ruled are guided by the demands of the environment and the identity of the alliances.

The parameters measured by centrality, a property of neural networks that allude to a risk threshold. Values outside the threshold are assumed to be part of another node. Values internal to the threshold demonstrate the convergence of the elements in a central node.

The convergence of peripheral nodes into a central one. Clustering is a property of neural networks that allows it to be distinguished from other nodes. The parameters that measure the grouping suggest that the elements converge in a node that the literature identifies as entrepreneurship.

The relationships between the elements. It is possible to appreciate that positive relationships prevail, although asymmetric relationships prevail in the associations between intrinsic motivation and ethics. In other words, entrepreneurship is configured for intrinsic reasons such as inheritance and the legacy of the project to future generations, but it is opposed to ethics with care for the environment.


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The results show that entrepreneurship in the COVID-19 era is distinguished by being multidimensional, although the asymmetry between ethics and intrinsic motivation opens the discussion about the relevance of carrying out a project for moral reasons versus local or regional conventions around that project.

## CONCLUSION

Entrepreneurship in the COVID-19 era is distinguished by reorienting the optimization of resources and process and product innovations based on the distancing and confinement of people. Entrepreneurship as a response to the health and economic crisis is distinguished more by coexisting with risk scenarios than by avoiding them. Entrepreneurship in the COVID-19 era distinguishes innovative proposals from non-innovative responses. The pandemic forced innovative entrepreneurship to emerge. The pandemic reduced non-innovative responses to simple reactions. The distancing and confinement of people increased innovative responses. Anti-COVID-19 policies reduced resource optimization initiatives. Innovative entrepreneurship, unlike optimization entrepreneurship, is a sequence of coexisting responses to crises and risks. Optimizing entrepreneurship are only reactions to crises and risks. Rising risks drive significant optimization and systematic innovation.

## REFERENCES

Aqmala, D. and Putra, F. I. F. S. (2021) “Rayu : A Competitive Strategy Model of Wood Craft Business in Soloraya Post Covid-19 Pandemic”, Journal of Management and Entrepreneurship Research. Available at: https://journal.unisnu.ac.id/jmer/article/view/42

Barroso Tanoira, F. G., Santos Valencia, R. A. and López Ponce, M. E. (2020) “Factors that affect the experience of entrepreneurship in university students. A study in a private institution in Merida, Yucatan, Mexico”, Nova Scientia, 12(24). http://dx.doi./10.21640/ns.v12i24.2223

Da Rosa, C. M., de Vasconcellos, S. L. and Falaster, C. D. (2021) “The colors of entrepreneurship in Brazil: Effects of ethnicity on income, from a behavioral perspective”, Iberoamerican Journal of Entrepreneurship and Small Business. São Paulo, SP, 11(1), p. In layout editing process. http://dx.doi/10.14211/regepe.e1933 .

Iman, M., Darmayanti, N., & Suhardiyah, M. (2021, November 1). THE EFFECT OF GOOD CORPORATE GOVERNANCE AND COMPANY CHARACTERISTIC ON ENVIROMENTAL DISCLOSURE. Journal of Economics, Business, and Government Challenges, 4(2), 158-167. https://doi.org/https://doi.org/10.33005/ebgc.v4i2.202

Khan, M., Askari, M., Laila, A., & Ali, Q. (2022). IMPACT OF INTRAPRENEURIAL ORIENTATION, ENTREPRENEURIAL SKILLS AND PSYCHOLOGICAL EMPOWERMENT ON INTRAPRENEURIAL INTENTION OF HEIs IN KARACHI, PAKISTAN. Journal Of Business And Entrepreneurship, 10(1), 48-60. http://dx.doi:10.46273/job&e.v10i1.234

Maldonado, T., Carden, L., Brace, C. and Myers, M. (2021) “Fostering Innovation Through Humble Leadership and Humble Organizational Culture”, Journal of Business Strategies. Huntsville, Texas, 38(2), pp. 73–94. http://dx.doi/10.54155/jbs.38.2.73-94

Miah, M. S. (2021) “Investigating Structural Relationship among Service Quality Dimensions, Customer Satisfaction, and Customer Loyalty for Conventional Bank Customers: Evidence from Bangladesh”, Asian Business Review, 11(3), pp. 101-108. http://dx.doi/10.18034/abr.v11i3.593

Morched, S., Haj Brahim, A., & Jarboui, A. (2021). ENTREPRENEURSHIP INTENTIONS OF SFAX UNIVERSITY STUDENTS. Journal Of Business And Entrepreneurship, 10(1), 15-25. http://dx.doi:10.46273/job&e.v10i1.220

Najeh, H., & Morched, S. (2022). The ambitious entrepreneur and his role in stimulating creativity: The case of Tunisian entrepreneurs (EDITING ON-GOING). Journal Of Business And Entrepreneurship, 10(1). http://dx.doi/10.46273/job&e.v10i1.236

Perdana, R. (2021, November 1). ANALYSIS OF THEORY OF PLANNED BEHAVIOR (TPB) IN DISOBEDIENCE BEHAVIOR TOWARDS OCCUPATIONAL HEALTH AND SAFETY (K3). Journal of Economics, Business, and Government Challenges, 4(2), 139-146. https://doi.org/https://doi.org/10.33005/ebgc.v4i2.199

Olowookere, J., Odetayo, T., Adeyemi, A., & Oyedele, O. (2021). IMPACT OF COVID-19 ON WORKING CAPITAL MANAGEMENT: A THEORETICAL APPROACH. Journal Of Business And Entrepreneurship,

10(1), 38-47. http://dx.doi/10.46273/job&e.v10i1.224
Reavis, M., Singh, K. and Tucci, J. (2021) "Millennials' Strategic Decision Making Through the Lens of Corporate Social Responsibility and Financial Management", Journal of Business Strategies. Huntsville, Texas, 38(2), pp. 125–146. http://dx.doi/10.54155/jbs.38.2.125-146
Setyanti, A. (2021) "University Graduates and the Entrepreneurial Intention: Evidence from Indonesia", Business Innovation and Entrepreneurship Journal, 3(4), pp. 293-298. http://dx.doi/10.35899/biej.v3i4.331
Saha, T. and Jannat, F. (2021) "Disclosure of Sustainable Development Goals (SDGs) in Bangladesh: A Study on DSE Listed Companies ", Asian Business Review, 11(3), pp. 93-100. http://dx.doi/10.18034/abr.v11i3.594
.
Sahli Costabal F, Yang Y, Perdikaris P, Hurtado DE and Kuhl E (2020) Physics-Informed Neural Networks for Cardiac Activation Mapping. Front. Phys. 8:42. http://dx.doi,org/10.3389/fphy.2020.00042
Sidrat, S., & Boujelbene, Y. (2022). The Entrepreneurial University: Why Focusing on the Organization of Student Life? (EDITING ON-GOING). Journal Of Business And Entrepreneurship, 10(1). http://dx.doi/10.46273/job&e.v10i1.192
Silva, H. C. C. da, Dornelas, J. S. and Araújo, M. A. V. (2021) "Strategic role of IT and IT governance mechanisms for the context of small and medium enterprises", Iberoamerican Journal of Entrepreneurship and Small Business. São Paulo, SP, 11(1), p. In proofreading process. http://dx.doi/10.14211/ibjesb.e2051 .
Souza, R. F., Ballini, R., Silveira, J. M. F. J. and Teixeira, A. A. C. (2021) "Is entrepreneurship an emerging area of research? A computational response", Iberoamerican Journal of Entrepreneurship and Small Business. São Paulo, SP, 11(1), p. In layout editing process. http://dx.doi/10.14211/ibjesb.e1742
Tasnim, C., & Wuryani, E. (2021, November 1). POTENTIAL MAPPING OF PESANTREN AS COMMUNITY ECONOMIC EMPOWERMENT CAPITAL. Journal of Economics, Business, and Government Challenges, 4(2), 84-94. https://doi.org/https://doi.org/10.33005/ebgc.v4i2.194
Tandoh, I. ., Duffour, K. A., Essandoh, M. . and Amoako, R. N. . (2022) "Corporate Governance, Corporate Social Responsibility, and Corporate Sustainability: The Moderating Role of Top Management Commitment", International Journal of Professional Business Review. São Paulo (SP), 7(2), p. e0309. http://dx.doi/10.26668/businessreview/2022.v7i2.309 .
Wasim, S. M. S. and Ur Rehman, M. (2022) "Role of Transformational Leadership Style of Accounting Professionals towards Subordinates Performance, OCB, and Innovation: Mediating Effect of Integrity and Thriving", Journal of Entrepreneurship, Management, and Innovation. Karachi, PK, 4(1), pp. 1-26. http://dx.doi/10.52633/jemi.v4i1.147.

**ANNEX A**

**Instrument to Measure Entrepreneurship in the Face of the Pandemic**

**Section 1: General Data**

1. Age:
2. Gender:
3. Career or area of study:
4. Semester or educational level:

Section 2: Impact of the Pandemic on Entrepreneurship

1. Perception of Economic Impact:
 - How do you perceive that the pandemic has affected your personal economic situation?
 - Very negatively / Negatively / Neutral / Positively / Very positively
2. Changes in Entrepreneurial Attitudes:
 -How has your interest in entrepreneurship changed due to the pandemic?
 - Less interested / Equally interested / More interested
3. Entrepreneurial Experiences During the Pandemic:
 - Have you undertaken any projects or activities during the pandemic?
 - But
 - If yes, briefly describe the project or activity undertaken:
4. Challenges Experienced:
 - What specific challenges have you faced when entrepreneurship during the pandemic? (Open space for free responses)

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Section 3: Entrepreneurial Competencies
1. Initiative:
- How often do you look for opportunities to start projects or solve problems on your own?
- Never / Rarely / Sometimes / Frequently / Always
2. Troubleshooting:
-How would you rate your ability to identify and address problems effectively?
- Very low / Low / Moderate / High / Very high
3. Decision Making:
- How often do you feel comfortable making difficult and risky decisions?
- Never / Rarely / Sometimes / Frequently / Always
4. Resource Management:
- How do you typically manage your resources (time, money, etc.) when working on projects?
- Inefficient / Little efficient / Moderately efficient / Very efficient
5. Innovation and Creativity:
- How often do you come up with new ideas or creative approaches to solving problems?
- Never / Rarely / Sometimes / Frequently / Always
Section 4: Opinions and Expectations
1. Institutional Support:
- How do you evaluate the university's support to promote entrepreneurship during the pandemic?
- Very low / Low / Moderate / High / Very high
2. Future Expectations:
- What are your expectations regarding entrepreneurship after the pandemic?
- I will reduce my interest / I will maintain my interest / I will increase my interest
Section 5: Additional Demographic Information (Optional)
- Socioeconomic level.
- Previous work experience.
- Participation in university entrepreneurship programs, if applicable.


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