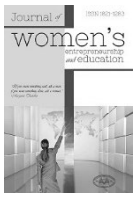
ISSN 1821-1283

Journal of women's entrepreneurship and education

"If you want something said, ask a man; if you want something done, ask a woman."
Margaret Thatcher

No. 1-2/2024



No. 1-2/2024
Twice a Year Scientific Journal
ISSN 1821-1283
UDC 005.64:37:316.344.5
COBISS.SR-ID 157987852

PUBLISHER
Institute of Economic Sciences
12 Zmaj Jovina str.
11000 Belgrade, Serbia

EDITORIAL OFFICE
c/o Institute of Economic Sciences
12, Zmaj Jovina str., Belgrade, Serbia
Tel. +381 11 2622-357; 2629-960
www.ien.bg.ac.rs
jweoffice@ien.bg.ac.rs

JOURNAL SECRETARY
Marija Antonijević
Institute of Economic Sciences, Belgrade
jweoffice@ien.bg.ac.rs

JWEE is involved in the following databases: ERICH PLUS, EconLit - American Economic Association, Research Papers in Economics (RePEc), ECONBIZ - Economic Literature, Germany. Open Access Journals (DOAJ) focused on Women's Studies.
In April 2020, JWEE was accepted for Scopus coverage, Elsevier.

JWEE is involved in the Peer Reviewed Journals List by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia

Contents

Note of Editor in Chief

Dear authors,

I would like to thank all the authors who contributed to the quality of their articles in this new issue. The choice of articles is very high, considering the rank of the Journal. Keep in mind that this policy of the JWEE will be continued in the following issues as well. Please send articles through the journal's platform and follow the complete procedure from the moment the paper is sent to the moment it has passed the peer review. Respond to all requests within the required time frame.

I must also stress that all articles submitted to the journal should be unpublished and must not be in the review process by any other journal. Once a paper has been reviewed and accepted for publication, you cannot withdraw it and offer it to another journal. The order and number of authors you specified in the cover letter cannot be changed later.

Finally, please spread the word about the value of publishing with JWEE, encouraging your best colleagues to submit high-quality articles.

Yours faithfully,
Prof. Dr Mirjana Radovic-Markovic

Editor in Chief

DOI: 10.28934/jwee24.12.pp1-18
JEL: L26, O14

ORIGINAL SCIENTIFIC PAPER

Fostering Women Entrepreneurs: Psychological Capital, Psychological Empowerment and Entrepreneurial Spirit

Pratikshya Bhandari [1]
Metharath University, School of Management, Sam Khok District, Pathum Thani, Thailand
Bijay Sigdel
INTI International University & Colleges, Negeri Sembilan, Malaysia [2]
A. K. Mahbubul Hye [3]
Metharath University, School of Management, Sam Khok District, Pathum Thani, Thailand
Sudarshan Bhandari [4]
Pokhara University, School of Engineering Faculty of Science and Technology, Kaski District, Gandaki Province, Nepal
Asmita Bhattarai [5]
Asian Institute of Technology, Klong Luang, Pathum Thani, Thailand

A B S T R A C T

Psychological capital is a central notion that has emerged in entrepreneurial behavior. This study looks at how psychological empowerment plays a mediating role in the relationship between psychological capital (PsyCap) and women's entrepreneurial spirit. Data were collected from 203 women-owned manufacturing

[1] Corresponding author, e-mail: sevendropsc@gmail.com
[2] E-mail: sigdelbijayy@gmail.com
[3] E-mail: thofa8@yahoo.com
[4] E-mail: bhsudarshan.edu@gmail.com
[5] E-mail: asmitabhattarai73@gmail.com

industries. Through the Smart PLS software, the hypothesis is tested using partial least squares structural equation modeling (PLS-SEM), which uses algorithms and bootstrapping to measure the association. Data analysis concluded that PsyCap has a significant positive relationship with entrepreneurial spirit and psychological empowerment. The association between psychological empowerment and entrepreneurial spirit is also significant and positive. Correspondingly, mediation of psychological empowerment exists between PsyCap and psychological empowerment. In a precise form, PsyCap and psychological empowerment can develop entrepreneurial spirits.

KEYWORDS: *psychological capital, psychological empowerment, entrepreneurial spirit, Nepalese women entrepreneurs, manufacturing industry*

Introduction

Entrepreneurship is a developing phenomenon worldwide, not only because it contributes to job creation but also because it contributes to the long-term competitiveness of a country's economic activity (Margaca et al., 2021). Entrepreneurship has the potential to be a substantial source of economic growth and job creation in Nepal, and women entrepreneurs play an indispensable role in this process (Alambaigi et al., 2018; Manandhar, 2022). Entrepreneurship characteristics, attitudes, and intentions influence entrepreneurial and self-employment behaviors. Encouragement and support for women's entrepreneurial spirit are crucial not only for the individual but for the economy of a whole country. The National Economic Census of 2018 shows that women own 247,882 businesses in Nepal, or 29.8 percent of all businesses (Government of Nepal, 2019). Women-owned firms are more robust and sustainable and may play an imperative role in engendering economic growth and employment creation (Bhandari & Amponstira, 2020). According to the Government of Nepal, 2019, there are 23,421 manufacturing industries owned by women.

Women's empowerment contributes to the economy, improves their and their family's well-being, and supports social and political stability (Ravic & Nikitovic, 2016). In general, empowerment is closely related to an individual's psychological qualities. As a result, one of the most successful approaches to empowerment is the psychological approach (Safarabadi et al., 2015). Consequently, individuals' psychological capital (PsyCap), as one of their psychological qualities, can support the emergence of entrepreneurship and innovation (Youssef & Luthans, 2007) and also primes

the triumph of entrepreneurs by taming empowerment. Empowered are more inclined to take the initiative, be proactive, and pursue their objectives. Psychological empowerment in the context of women's entrepreneurship can help women feel more confident in their abilities to start and run a business and overcome societal and cultural barriers that may discourage or limit their entrepreneurial aspirations. Psychological empowerment is positively related to entrepreneurial intentions among women (Chakraborty & Biswal, 2023). Women's Psycap and empowerment can help to build a stronger entrepreneurial spirit and encourage more women to start and run firms.

In order to advance the socioeconomic situation in Nepal, it is crucial to investigate the influences of women's psychological capital, psychological empowerment, and entrepreneurial spirit. Understanding these elements is essential as Nepal continues to work toward economic development and social advancement. Examining women's psychological capital in Nepal can pinpoint people's advantages and disadvantages and create interventions to strengthen these psychological resources (Dhaubhadel, 2021). This can strengthen Nepalese businesswomen's adaptability, motivation, and confidence, thus increasing their probability of success. Similarly, investigating women's psychological empowerment in Nepal can reveal the elements that allow people to accept responsibility for their work, make significant contributions, and feel fulfilled (Gautam, 2017). Policymakers and organizations may establish entrepreneurial environments that encourage people to take control of their economic futures by recognizing the hurdles and facilitators of empowerment. Likewise, exploring the factors that contribute to the entrepreneurial spirit in Nepal can gain insights into the unique challenges and opportunities faced by Nepalese women entrepreneurs (Khoo et al., 2023). The information can be used to guide the creation of focused entrepreneurship development programs, regulation, and educational efforts that support and develop the nation's entrepreneurial talent. Therefore, studying these factors in the context of Nepalese women entrepreneurs is important. As the situation unfolds, numerous studies about PsyCap (Thakur et al., 2022; Kariri & Radwan, 2023) and psychological empowerment (Hsieh et al., 2022; Hibbs, 2022) are exits. However, the study related to entrepreneurial spirit are limited (Haji et al., 2022). Intensely, the study about PsyCap on women's entrepreneurial spirit is limited. Therefore, this study addresses the research gap by studying PsyCap and women's entrepreneurial spirit, with psychological empowerment as the mediating role.

As a result, the study examined how PsyCap affected women's entrepreneurial spirit and the mediating impact that psychological empowerment had on it. The study offers knowledge that helps professionals and educators understand the impact of PsyCap and psychological empowerment on developing an entrepreneurial spirit. The literature review and hypothesis are developed in the subsequent part, which is then followed by the methodology, data analysis, and discussion, as well as the conclusion and implications. Finally, the limitations and future research directions are explored.

Literature Review and Hypothesis Development

An overview of the literature on Nepalese women entrepreneurs and the connection between psychological capital, psychological empowerment, and entrepreneurial spirit is provided below.

Nepalese Women Entrepreneur

"I believe in myself; I can do so, therefore I did," is the statement that encapsulates what it means to be a woman entrepreneur. Women entrepreneurs are ready to do something and are willing to endure challenges and barriers to achieve their goals and add another brick to the wall of success (Bhandari & Amponstira, 2021; Bhandari, et al. 2022). Traditionally, women are inbounded with a negative attitude from society. Women working outside the house are pointed out as a disgrace to the family in some portions of the country (Tuladhar, 1996); comparatively, women step late into the field of economic activities due to the sociocultural environment (Dwibedi, 2015; Sajid et al., 2016; Bhandari et al., 2023). Women have struggled to raise their ventures, but in the meantime, rising numbers of women entrepreneurs are vital to promoting economic growth (Dwibedi, 2015). Currently, women own one-third of the enterprises in Nepal (Government of Nepal, 2019). To enhance women's empowerment, the government has prioritized women in registration and renewal (Government of Nepal, 2020). It is crucial to look at these elements in the context of female entrepreneurship in Nepal for several reasons, including identifying the obstacles, fostering economic development, increasing gender equality, and guiding policy and initiatives. Evidently, PsyCap and PE are two psychological variables that have been found to have a positive impact on entrepreneurial spirit (Haji et al., 2022). Therefore, the

development of PsyCap and PE can play an important role in promoting the entrepreneurial spirit in women.

Psychological Capital and Psychological Empowerment

Psychological capital is one of the main notions that have emerged in the field of entrepreneurial behavior (Youssef & Luthans, 2007). PsyCap is a construct that refers to an individual's favorable psychological development state, which is characterized by four elements: optimism, efficacy, resilience, and hope (Luthans et al., 2006; Sahin, Cubuk & Uslu, 2014). Hope is faith in one's ability to continue toward goals and find ways to achieve them. Entrepreneurs with high hope are likely to take calculated risks and persist in facing challenges. In the same way, efficacy defines a person's belief in their own abilities to complete specified activities successfully. High-efficacy entrepreneurs are more inclined to take on challenging ventures and keep going in the face of obstacles. Further, resilience is defined as the ability to recover from hardship. Resilient entrepreneurs are more feasible to see failures as chances for learning and progress. Finally, optimism is defined as a positive attitude toward life, even in adversity. Optimistic entrepreneurs tend to regard failures as temporary and situational rather than permanent and prevalent (Liao et al., 2017; Kariri & Radwan, 2023).

PsyCap, as a positive psychology development, could help individuals understand their competency and enhance their skills, as well as the concept of psychological empowerment (Wardani & Amaliah, 2020). Having a high PsyCap can help reduce workplace issues' negative consequences, giving people a sense of control and autonomy over their work, comparable with psychological empowerment. The ability to create a solution to the complex challenge is hope, and employing the alternatives without hesitation for permission is efficacy, which would be an efficiency-hope in one. This gives a sagacity of autonomy and control over the work environment. This psychological apparatus creates a positive rapport between PsyCap and PE (Iqbal & Ahmad, 2017). The study (Thakur et al., 2022; Kariri & Radwan, 2023) states that PsyCap and PE have a positive and significant association. Therefore, the study counsels:

H1: "Psychological capital has a positive and significant relationship with psychological empowerment."

Psychological Empowerment and Entrepreneurial Spirit

Empowerment acknowledges the power people already have in their richness of valued skills and personal motivation, either from a structural or a psychological standpoint (Ma et al., 2021). Merely, psychological empowerment refers to an individual's control over their working environment. Psychological empowerment is intrinsic motivation in four categories that epitomize individuals' attitudes on their employment role and how well it fulfills work requirements (Spreitzer, 1995): meaning, impact, competence, and self-determination. Meaning determines how much individuals believe their labor is meaningful and vital. Further, impact determines how much a person believes their job benefits others or the business. Additionally, competence determines how much a person believes they are capable and confident in their skills to do their jobs. Lastly, self-determination is the extent to which individuals believe they have control over their own work and decisions (Pacheco & Coello-Montecel, 2023).

Entrepreneurial spirit can benefit from psychological empowerment. Individuals are more willing to take chances and seek entrepreneurial opportunities when they feel empowered in their employment and believe they have control over their actions and outcomes. They are also more likely to have the self-esteem and ambition to start and build a business. Those with an entrepreneurial spirit may seek opportunities to feel psychologically empowered (Lizar et al., 2015). The study (Haji et al., 2022) demonstrates a strong relationship between entrepreneurial spirit and PE. Therefore, the study counsels:

H2: "Psychological empowerment has a positive and significant relationship with an entrepreneurial spirit."

Psychological Capital, Psychological Empowerment, and Entrepreneurial Spirit

The entrepreneurial spirit aligns with the human dimension of development (Haji et al., 2022). The entrepreneurial spirit is a mindset or a way of thinking that is characterized by a desire to take risks, innovate, and create new opportunities. It necessitates imagination, initiative, and a drive to succeed despite obstacles. It entails being willing to take measured chances, think creatively, and adapt to change. A person with a robust entrepreneurial spirit is always looking for ways to enhance and encompass the business more and more. ES encompasses a set of psychological

qualities: the desire for achievement, creativity, independence, ambiguity tolerance, and internal locus of control, risk-taking (Tripopsakul et al., 2022).

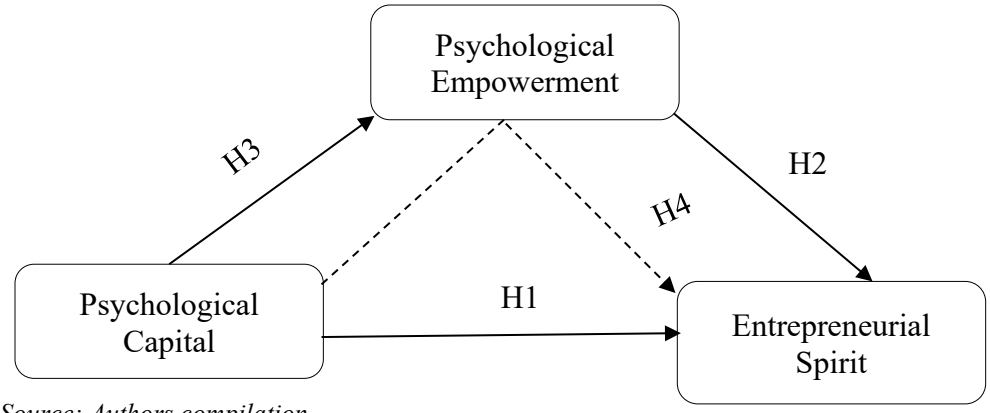
PsyCap and PE can foster positive and empowered entrepreneurial spirits. Entrepreneurs with these features are more likely to have the confidence and motivation to follow their entrepreneurial ambitions despite challenges and hurdles. As a result, a dynamic entrepreneurial ecosystem which empowered to drive innovation, generate jobs and contribute to economic growth. The study (Avey et al., 2010) shows that PsyCap and PE have a positive and significant relationship. In the same way, entrepreneurial spirit has a mediation role between PsyCap and PE (Haji et al., 2022). Therefore, the study counsels:

H3: "Psychological capital has a positive and significant relationship with an entrepreneurial spirit."

H4: "Psychological empowerment has the mediation relationship between psychological capital and entrepreneurial spirit."

Figure 1 illustrates the proposed research hypothesized framework.

Figure 1: Research Framework



Source: Authors compilation

Methodology

The study examines the pillars of PsyCap that can make it better in the women-owned manufacturing industries. It also includes the mediating role of psychological empowerment in the relationship between psychological capital and entrepreneurial spirit. The measurement of the variables was

done by the literature review and validated the scale. The questionnaire development for psychological capital consists of self-efficiency (PC1), hope (PC2), resilience (PC3), and optimism (PC4), as mentioned in (Martinez et al., 2019; Xu, 2023). And psychological empowerment consists of meaning (PE1), competence (PE2), self-determination (PE3), and impact (PE4), as stated in (Muduli, 2017; Kiziloglu et al., 2023). Entrepreneurial spirit consists of the need for achievement (ES1), risk-taking (ES2), creativity (ES3), desire for independence (ES4), and internal locus of control (ES5) as specified in (Wiyono & Wu, 2022; Tripopsakul et al., 2022). The scale ranged from 1 for "strongly disagree" to 5 for "strongly agree" on a 5-point Likert scale.

The study employed a quantitative method by conducting a closed-end questionnaire survey. For the validity of the questionnaire, the item objective congruence (IOC) test was used with five experts before going for the data collection process. The Chamber of Commerce and Industry of various districts in the province of Gandaki was initially used to compile a list of women-owned manufacturing industries. The sample data is collected by using the stratified random sampling technique. The validity of the items is investigated in the pilot study using a sample of 30 participants. The questionnaire was distributed to 250 respondents; out of that, 203 questionnaires were usable, i.e., 81.2%. The software used for data analysis was Smart Partial Least Squares (Smart PLS) and the Statistical Package for Social Science (SPSS). Data analysis was done by using the measurement model and structural model.

The study consists of 203 respondents who participated in the study, where 115 respondents (56.7%) were married, and 88 respondents (43.3%) were single. The years of operation of the industries from 6 to 10 years was 43.3%, followed by up to 5 years was 27.1%, 11 to 15 years was 17.2%, and above 15 years from 12.3%, respectively. The number of employees working in the industries from 10 to 49 was 47.8%, followed by 1 to 9 were 37.9%, 50 to 100 was 12.3%, and above 100 was 2.0%, respectively.

Data Analysis and Discussion

This research study applied the SEM model using Smart PLS 4, the most recent version. The relation between the independent, the dependent, and the mediator is measured using structural equation modeling. The construct in this study uses one independent, one dependent, and one

mediating variable. PLS algorithms and Bootstrapping are two steps considered in structural equation modeling. The weighted vector-based regression analysis model with PLS algorithms shows coefficient values. Bootstrapping values are used to generate regression models.

Measurement Model

The measurement model explains how latent variables are measured using observable variables. (Kang & Ahn, 2021). The measurement model shows composite reliability, and with Cronbach's alpha together, they make up internal consistency; Convergent validity consists of outer loading and average variance extracted; Discriminant validity consists of Fornell and Larcker. Cronbach's alpha should be more than 0.7 for acceptance (Griethuijsen et al., 2015), and the acceptance criteria for composite reliability should be from 0.7 to 0.9 (Hair et al., 2021). The outer loading of less than 0.4 should be eliminated from the model, and the average variance extracted should be more than 0.5 (Hair et al., 2021). The Fornell Larcker criterion compares the square roots of each construct's AVE that should be higher than any other construct's highest correlations (Hair et al., 2021).

Table 1: Loadings, Cronbach's alpha, AVE, CR

	Items	**Loadings**	**Cronbach's alpha**	**CR**	**AVE**
Psychological Capital	PC1	0.741	0.718	0.826	0.544
	PC2	0.808			
	PC3	0.739			
	PC4	0.654			
Psychological Empowerment	PE1	0.865	0.678	0.861	0.756
	PE2	0.875			
Entrepreneurial Spirit	ES1	0.677	0.778	0.849	0.530
	ES2	0.719			
	ES3	0.722			
	ES4	0.739			
	ES5	0.779			

Source: Data and information from the study

Table 2: Fornell Larcker criterion

	Entrepreneurial Spirit	**Psychological Empowerment**	**Psychological Capital**
Entrepreneurial Spirit	0.728		
Psychological Empowerment	0.350	0.870	
Psychological Capital	0.394	0.554	0.738

Source: Data and information from the study

Structural Model

The study's structural model displays the path coefficient values: t-value, p-value, standard error, and beta value. Bootstrapping indicates a significant p-value that indicates whether the hypothesis is accepted or rejected. All hypotheses are accepted and supported based on the study's criteria since p values are significant and t values are larger than 1.96.

In Table 3 first hypothesis (H1): Psychological capital has a positive and significant relationship with psychological empowerment (T-value = 11.25, P-value = 0.000), is accepted. The result is consistent with Wardani and Amaliah (2020) and Thakur et al. (2022), which explain that psychological capital supports people in understanding their competence and enhancing their talents, as well as the idea of psychological empowerment. The second hypothesis (H2): Psychological empowerment has a positive and significant relationship with an entrepreneurial spirit (T-value = 2.38, P-value = 0.017), is accepted. The result is in line with Haji et al. (2022) and Lizar et al. (2015) that the impact of psychological empowerment on entrepreneurial spirit has a strong relationship. Third hypothesis (H3): Psychological capital has a positive and significant relationship with an entrepreneurial spirit (T-value = 3.53, P-value = 0.000), is accepted. The result is consistent with Avey et al. (2010) and Haji et al. (2022) that the direct effect of psychological capital on entrepreneurial spirit was positive and significant. Fourth hypothesis (H4): Psychological empowerment has a mediation relationship between psychological capital and entrepreneurial spirit (T-value = 2.27, P-value = 0.023), is accepted. The result is in line with Haji et al. (2022), who state that there is a mediating effect of psychological empowerment in the relationship between psychological capital and entrepreneurial spirit was significant.

The criteria for evaluating the structural model are the level of coefficient of determination (R^2) and effect size (f^2). Better scores indicate higher levels of predicting accuracy, and the R^2 number ranges from 0 to 1. For an endogenous latent variable, **R^2 >= 0.75**; **0.50 <= R^2 < 0.75**; **0.25 <= R^2 < 0.50**; **R^2 < 0.25** can be categorized as substantial, moderate, weak, and very weak (Hair et al., 2021). The study indicates that the entrepreneurial spirit's R^2 value is 0.18, which is considered very weak. And the R^2 value of psychological empowerment is 0.307, which is considered weak.

Effect sizes (f2) between 0.02 and 0.14 are regarded as small effects, 0.15 to 0.34 as medium effects, and 0.35 and higher as large effects (Cohen, 2013), as shown in Table 4.

Table 3: Path Analysis

	Std Beta	SD	T values	P values	Verdict
Psychological Capital -> Psychological Empowerment	0.554	0.049	11.25	0.000	Accepted
Psychological Empowerment -> Entrepreneurial Spirit	0.189	0.080	2.38	0.017	Accepted
Psychological Capital -> Entrepreneurial Spirit	0.289	0.082	3.53	0.000	Accepted
Psychological Capital -> Psychological Empowerment -> Entrepreneurial Spirit	0.105	0.046	2.27	0.023	Accepted

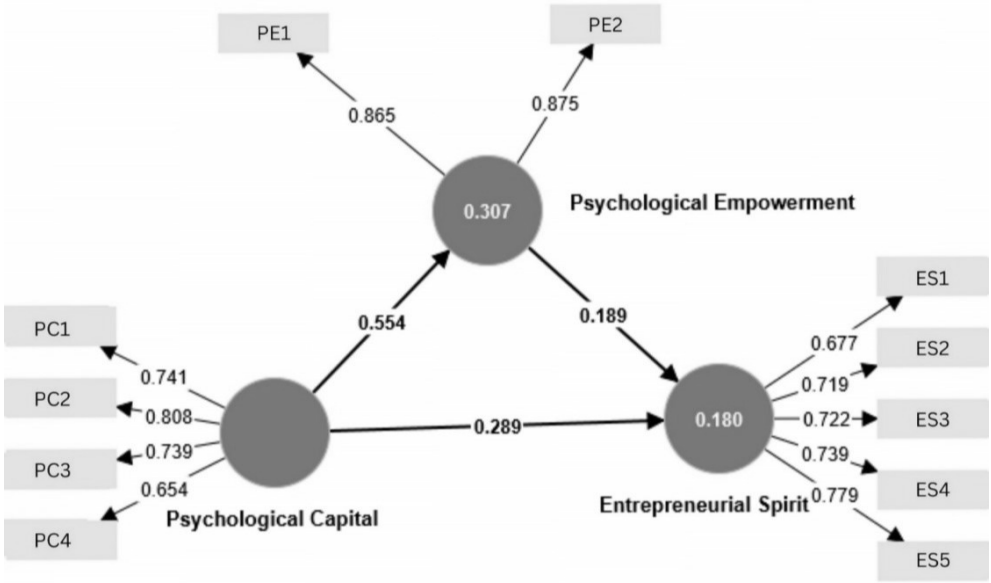
Source: Data and information from the study

Table 4: Effect size (f^2)

Construct	Psychological Empowerment	Entrepreneurial Spirit
Psychological Capital	0.443 (Large Effect)	0.071 (Small Effect)
Psychological Empowerment		0.03 (Small Effect)

Source: Data and information from the study

Figure 2: Path Analysis



Source: Data and information from the study

Conclusion and Recommendation

Those who are psychologically empowered and have high levels of psychological capital are more likely to try to solve problems and insist on finishing activities when they have the required skills. Psychological capital provides people with positive thoughts, attitudes, and behaviors. Women's potential is crucial for the manufacturing sector to have access to the entrepreneurial skills required to overcome the economic disruption caused by COVID-19. The study analyzed how psychological capital influences the entrepreneurial spirit and the mediating effect of psychological empowerment influences the entrepreneurial spirit of women-owned manufacturing industries. The results of this study will advance the understanding of women entrepreneurs by underlining the value of psychological capital and psychological empowerment in encouraging their entrepreneurial spirit. The findings of the study can be used to establish legislative efforts, training programs, and treatments that are specifically designed to empower and support psychological well-being in women entrepreneurs. The success of women entrepreneurs will ultimately be aided by providing for their psychological requirements, which will result in more

inclusive and prosperous business environments. Similarly, in its precise form, the verdict of this study bids treasured aids to the entrepreneurial spirit, psychological empowerment and psychological capital of women-owned manufacturing industries.

Both theoretical and practical implications result from encouraging women entrepreneurs and comprehending the significance of psychological capital, psychological empowerment, and entrepreneurial spirit. Practically, recognizing the value of psychological capital can inspire the creation of interventions and assistance programs that improve female entrepreneurs' self-efficacy, optimism, hope, and resilience. This, in turn, may enhance their general well-being and professional effectiveness. Theoretically, exploring these ideas about women business owners can advance the fields of positive psychology, gender studies, and entrepreneurship theory. By giving us more awareness of the particular psychological aspects that affect women's success and well-being as entrepreneurs as well as insights into the underlying mechanisms and processes at play, it can help us better comprehend these issues. Theoretical research in this field can assist in identifying the particular psychological resources, attitudes, and motives that support women's entrepreneurial pursuits, enabling the creation of more thorough models and theories of entrepreneurship. In addition, it reveals the intricate connections and interactions between these constructs, enabling a more nuanced understanding of their combined effects on the outcomes of women entrepreneurs. Women in manufacturing industries should focus on psychological capital, the internal resource that helps manage the tough situation and increase the entrepreneurial spirit that can be better for the industries. Similarly, they should also focus on psychological empowerment, which is the indicator of internal motivation to encourage entrepreneurial spirit in the industries. In the same way, a mediating role of psychological empowerment should be involved to increase the entrepreneurial spirit with the relationship with psychological capital in the women manufacturing industries.

Limitations and Further Research

This research has limitations that open boulevards for further research. Initially, this research focuses on the women-owned manufacturing industry in Nepal. This conclusion may limit applicability to different circumstances, cultures, or countries. More research can be conducted to duplicate and

broaden the findings to a specific industry area. This might reveal even more sophisticated constructions of psychological capital, psychological empowerment, and a spirit of entrepreneurship. Subsequently, this study used cross-sectional data, which may limit the ability to detect changes in the entrepreneurial spirit of women. So, further research can conduct longitudinal approaches to understand the effect of psychological capital on women's entrepreneurial spirit.

Finally, this study only observed psychological capital's effect on the entrepreneurial spirit as mediated by psychological empowerment. The entrepreneurial spirit and psychological empowerment, however, can be influenced by a variety of economic, social, cultural, psychological, and even political aspects, so it's crucial to keep this in mind. As a result, it is proposed that future studies consider this topic and study the effect of other factors, such as social media, positive psychology, and leadership, on entrepreneurship spirit and psychological empowerment. It is because investigating social media's impact can also reveal potential drawbacks like information overload and social comparisons that may undermine psychological empowerment. Understanding how social media and entrepreneurship interact might help develop strategies for utilizing these platforms successfully and encourage entrepreneurs' psychological well-being. In the same way, understanding positive psychology, strengths, and mentality in the context of entrepreneurship helps illuminate how they support entrepreneurial spirit and psychological empowerment. Developing interventions and methods that support an entrepreneurial attitude and general well-being is possible by identifying the elements that make entrepreneurs feel more optimistic. Likewise, finding successful leadership styles, perspectives, and methods that empower and drive business owners can be facilitated by studying leadership in the context of entrepreneurial spirit and psychological empowerment. Creating leadership programs specifically geared toward entrepreneurs can be aided by understanding how leadership traits like transformational or servant leadership affect entrepreneurial motivation, team dynamics, and organizational climate. Studying leadership in this setting can also provide insights into developing empowering leadership cultures that promote psychological well-being and entrepreneurship.

References

[1] **Alambaigi, A., Jalilian, S., & Latifi, S.** (2018). Effect of entrepreneurship characteristics on rural youths' attitude and intention toward self-employment (case study villages of West Islamabad County). *Iranian Journal of Agricultural Economics and Development Research (IJAEDR)*, *48*(4), 681-691.

[2] **Avey, J. B., Luthans, F., Smith, R. M., & Palmer, N. F.** (2010). Impact of positive psychological capital on employee well-being over time. *Journal of occupational health psychology*, *15*(1), 17.

[3] **Bhandari, P., & Amponstira, F.** (2020). Effect of Entrepreneurial Orientation on Profitability of Women Owned Enterprises in Pokhara City, Nepal. *International Business Research*, *13*(10), 1-66.

[4] **Bhandari, P., & Amponstira, F.** (2021). Model of entrepreneurial orientation, competitive advantage and performance of women-owned enterprises in Gandaki Province, Nepal. *Open Journal of Business and Management*, *9*(6), 2854-2865.

[5] **Bhandari, P., Sigdel, B., Rungsuk, A., Chumlim, M., & Phiewla-or, A.** (2022). Survival of the Women Entrepreneurs During Pandemic: The Mediating Role of Competitive Advantage on Entrepreneurial Orientation and Firm Performance in Nepal. *The Journal of Pacific Institute of Management Science (Humanities and Social Science)*, *8*(2), 223-235.

[6] **Bhandari, P., Sigdel, B., Photchanachan, S., Uppapong, K., & Bhattarai, A.** (2023). Revamp of Tourism Industry in Nepal. *Journal of Women's Entrepreneurship and Education*, (1-2), 89-109.

[7] **Chakraborty, U., & Biswal, S. K.** (2023). Impact of social media participation on female entrepreneurs towards their digital entrepreneurship intention and psychological empowerment. *Journal of Research in Marketing and Entrepreneurship*, *25*(3), 374-392.

[8] **Cohen, J.** (2013). *Statistical power analysis for the behavioral sciences.* 2nd. New York: Routledge.

[9] **Dhaubhadel, I.** (2021). The mediating role of psychological capital (PsyCap) on the relationship between human resource development (HRD) climate and employee performance: A study in Nepali developmental organizations. *South Asian Journal of Management*, *28*(1), 25-58.

[10] **Dwibedi, L.** (2015). Women entrepreneurship and innovations: A critical analysis. *Academic Voices: A Multidisciplinary Journal*, *5*, 16-21.

[11] **Gautam, D. K., & Bhandari Ghimire, S**. (2017). Psychological empowerment of employees for competitive advantages: An empirical study of Nepalese service sector. *International Journal of Law and Management*, *59*(4), 466-488.

[12] **Government of Nepal.** (2019). *National Economic Census 2018.* Kathmandu: Central Bureau of Statistics, 77.

[13] **Van Griethuijsen, R. A., van Eijck, M. W., Haste, H., Den Brok, P. J., Skinner, N. C., Mansour, N., ... & BouJaoude, S.** (2015). Global patterns in students' views of science and interest in science. *Research in science education*, *45*, 581-603.

[14] **Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S.** (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*. Springer Nature.

[15] **Haji, L., Valizadeh, N., & Karimi, H.** (2022). The effects of psychological capital and empowerment on entrepreneurial spirit: The case of Naghadeh County, Iran. *International Journal of Finance & Economics*, *27*(1), 290-300.

[16] **Hibbs, L.** (2022, January). "I could do that!"–The role of a women's non-governmental organisation in increasing women's psychological empowerment and civic participation in Wales. In *Women's Studies International Forum* (Vol. 90, p. 102557). Pergamon.

[17] **Hsieh, S. H., Lee, C. T., & Tseng, T. H.** (2022). Psychological empowerment and user satisfaction: Investigating the influences of online brand community participation. *Information & Management*, *59*(1), 103570.

[18] **Iqbal, K., & Ahmad, M. H.** (2017). Effect of psychological capital on organizational commitment: Mediating role of psychological empowerment. *Abasyn Journal of Social Sciences*, 72-87.

[19] **Kang, H., & Ahn, J. W.** (2021). Model setting and interpretation of results in research using structural equation modeling: A checklist with guiding questions for reporting. *Asian Nursing Research*, *15*(3), 157-162.

[20] **Kariri, H. D. H., & Radwan, O. A.** (2023). The Influence of Psychological Capital on Individual's Social Responsibility through the Pivotal Role of Psychological Empowerment: A Study Towards a Sustainable Workplace Environment. *Sustainability*, *15*(3), 2720.

[21] **Khoo, C., Yang, E. C. L., Tan, R. Y. Y., Alonso-Vazquez, M., Ricaurte-Quijano, C., Pécot, M., & Barahona-Canales, D.** (2023). Opportunities and challenges of digital competencies for women tourism entrepreneurs in Latin America: a gendered perspective. *Journal of Sustainable Tourism*, 1-21.

[22] **Kiziloglu, M., Dluhopolskyi, O., Laskowski, J., & Laskowska, A.** (2023). Creating Agile Institutions with Organizational Trust in the Finance Sector of Turkey: The Mediating Role of Psychological Empowerment in Times of COVID-19. *Sustainability*, *15*(4), 3019.

[23] **Liao, S. S., Hu, D. C., Chung, Y. C., & Chen, L. W.** (2017). LMX and employee satisfaction: mediating effect of psychological capital. *Leadership & Organization Development Journal*, *38*(3), 433-449.

[24] **Lizar, A. A., Mangundjaya, W. L., & Rachmawan, A.** (2015). The role of psychological capital and psychological empowerment on individual readiness for change. *The Journal of Developing Areas*, *49*(5), 343-352.

[25] **Luthans, F., Youssef, C. M., & Avolio, B. J. (2006).** *Psychological Capital: Developing the Human Competitive Edge.* Oxford University Press.

[26] **Ma, E., Zhang, Y., Xu, F. Z., Wang, D., & Kim, M. S.** (2021). Feeling empowered and doing good? A psychological mechanism of empowerment, self-esteem, perceived trust, and OCBs. *Tourism Management*, *87*, 104356.

[27] **Manandhar, R. B.** (2022). Emerging Challenges of Women Entrepreneurs in Nepal. *Nepal Journal of Multidisciplinary Research*, *5*(4), 11-18.

[28] **Margaça, C., Hernández-Sánchez, B., Sánchez-García, J. C., & Cardella, G. M.** (2021). The roles of psychological capital and gender in university students' entrepreneurial intentions. *Frontiers in psychology*, *11*, 615910.

[29] **Martínez, I. M., Youssef-Morgan, C. M., Chambel, M. J., & Marques-Pinto, A.** (2019). Antecedents of academic performance of university students: Academic engagement and psychological capital resources. *Educational Psychology*, *39*(8), 1047-1067.

[30] **Muduli, A.** (2017). Workforce agility: Examining the role of organizational practices and psychological empowerment. *Global Business and Organizational Excellence*, *36*(5), 46-56.

[31] **Nepal Government.** (2020). *Industrial Policy 2016.* Retrieved April 24, 2022, from https://moics.gov.np/en/sources/2/

[32] **Pacheco, P. O., & Coello-Montecel, D.** (2023). Does psychological empowerment mediate the relationship between digital competencies and job performance?. *Computers in Human Behavior*, *140*, 107575.

[33] **Ravic, N., & Nikitovic, Z.** (2016). Entrepreneurial education as a new paradigm of the development of women entrepreneurship in the Republic of Serbia. *Journal of Women's Entrepreneurship and Education*, (3-4), 102-116.

[34] **Safarabadi, A., Moayedfar, S., & Varesi, H.** (2015). Urban sustainable development with emphasis on the empowerment of informal settlements in urban areas: the case of Yazd, Iran. *European Journal of Geography*, *6*(1), 83-97.

[35] **Şahin, D. R., Çubuk, D., & Uslu, T.** (2014). The effect of organizational support, transformational leadership, personnel empowerment, work engagement, performance and demographical variables on the factors of psychological capital. *EMAJ: Emerging Markets Journal*, *3*(3), 1-17.

[36] **Sajid, M., Ansari, D. A., & Siddiqui, M. N.** (2016). Women entrepreneurship: the dynamic need of modern India. *An International Journal of Research & Innovation*, *3*(2), 27-31.

[37] **Spreitzer, G. M.** (1995). Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of management Journal*, *38*(5), 1442-1465.

[38] **Thakur, E., Vashista, G., & Shourie, S.** (2022). Linking Psychological Empowerment, Self-leadership and Psychological Capital among Young Entrepreneurs: Role of Positive Psychology in Building a Self-reliant India. *Indian Journal of Positive Psychology*, *13*(2), 129-136.

[39] **Tripopsakul, S., Mokkhamakkul, T., & Puriwat, W.** (2022). The development of the entrepreneurial spirit index: An application of the entrepreneurial cognition approach. *Emerging Science Journal*, *6*(3), 493-504.

[40] **Tuladhar, J.** (1996). *Factors affecting Women Entrepreneurship in small and cottage industries in Nepal.* ILO.

[41] **Wardani, L. M. I., & Amaliah, A.** (2020). The role of psychological empowerment as mediator between psychological capital and employee well-being. *Journal of Critical Reviews*, *7*(13), 291-296.

[42] **Wiyono, B. B., & Wu, H. H.** (2022). Investigating the Structural Effect of Achievement Motivation and Achievement on Leadership and Entrepreneurial Spirit of Students in Higher Education. *Administrative Sciences*, *12*(3), 99.

[43] **Xu, J.** (2023). The interplay between Chinese EFL teachers' positive psychological capital and their work engagement. *Heliyon*, *9*(2), e13151.

[44] **Youssef, C. M., & Luthans, F.** (2007). Positive organizational behavior in the workplace: The impact of hope, optimism, and resilience. *Journal of management*, *33*(5), 774-800.

Article history: Received: April 4th, 2023

Accepted: July 18th, 2023

DOI: 10.28934/jwee24.12.pp19-39
JEL: L26, 031, J20, 010, J23

ORIGINAL SCIENTIFIC PAPER

Entrepreneurial Attitude and Entrepreneurial Intentions of Female Engineering Students: Mediating Roles of Passion and Creativity

Monica J.[1]
Anuradha P S.[2]
CHRIST (Deemed to be University), School of Commerce, Finance and Accountancy, Bangalore, India

A B S T R A C T

Entrepreneurship holds a crucial function in addressing societal and economic issues like joblessness and inequalities between different regions. Acknowledging its significance, government officials and educational institutions exert considerable energy towards nurturing individuals into entrepreneurs. Multiple elements influence a person's path to becoming an entrepreneur. This research seeks to examine how one's entrepreneurial attitude (EA) impacts one's drive to become an entrepreneur, with passion and creativity serving as an intermediary in this connection. The research is explanatory and employs a survey-based approach. The findings convey that entrepreneurial attitude significantly influences the determination of female engineering students to pursue entrepreneurship. The study highlights the mediating roles of passion and creativity in the relationship between entrepreneurial attitude and intentions. While passion positively mediated the relationship, creativity had a negative mediating effect.

[1] Corresponding author, e-mail: monica.j@res.christuniversity.in
[2] E-mail: anuradha.ps@christuniversity.in

KEYWORDS: *entrepreneurship, engineering, economic development, innovation, employment*

Introduction

Entrepreneurship entails deliberate and purposeful actions, emphasizing that the initiation of a business is a result of conscious intent. The drive to be entrepreneurial can serve as a reliable indicator of how someone is likely to approach the process of building a new venture. Entrepreneurship's significance is recognized across developed and developing nations due to its bolstering a country's economic well-being (Jiatong et al., 2021). Entrepreneurial initiatives generate employment opportunities and growth (Anjum et al., 2022; Bignetti et al., 2021; Rita Amelinda, 2019). The inclination to be an entrepreneur is known as entrepreneurial intention (EI). A mental state that propels individuals towards initiating new business ventures is EI (Biraglia & Kadile, 2017a). EIs are shaped by many factors (Anjum et al., 2022). Numerous research works have demonstrated the influence of entrepreneurial education on shaping EIs (Jiatong et al., 2021; Setia & Nuringsih, 2022). Apart from entrepreneurial education, intrinsic features, including inspiration, efficiency, passion, mindset, attitude, altruism, vigilance, and creativity, substantially contribute to an individual's entrepreneurial intentions. Additionally, external factors like family support, institutional backing, and governmental assistance play pivotal roles in influencing individuals' EIs. "The Theory of Planned Behaviour" (TPB), put forth by Ajzen in 1991, underscores the relationship between "attitude, intention, and subsequent behavior." According to the TPB, a person's attitude influences their intention, which in turn shapes their actions. In the context of entrepreneurship, an individual's attitude toward this field significantly influences their intentions to engage in entrepreneurial activities. Individuals who are passionate about entrepreneurial activities have more possibility of becoming entrepreneurs on their own (Murad et al., 2021). Consequently, entrepreneurial passion appears to wield a considerable impact on an individual's entrepreneurial intentions.

Engineering students 'attitude' is known to have a greater impact on EI (Law & Breznik, 2017). To a large extent, the perception of behavioral control influences the gender impact on EI. Women's attitudes, subjective standards, perceived behavioral control, and their relationship with entrepreneurial goals ought to be targeted by the policymakers to boost female start-ups. Irrespective of the increased interest in the study of 'female

entrepreneurship,' there is a lacuna in the link between the person's gender and their entrepreneurial goals (Yordanova & Tarrazon, 2010). Gender disparity in students' EI highlighted that male students were more likely to be entrepreneurial than female students (Gure, 2017). Gerba (2012) argued that female engineering students tend to have an inclination towards entrepreneurial careers, subjective norms, and a need for achievement. EA had a significant impact on the EI of female students, while creativity had a lesser impact in influencing them to choose entrepreneurship (Law & Breznik, 2017). Passion plays a significant motivational role in human behavior (Thuy et al., 2020). Previous research works did not focus on the possibility of entrepreneurial passion (EP) serving as a mediator in the connection between EA and EIs. As a result, one of the objectives of this study has been to investigate the mediating role of entrepreneurial passion in the relationship between EA and EI (Ediagbonya, 2023). Creativity holds paramount importance for entrepreneurs, as it constitutes a vital element within the realm of entrepreneurship (Dali et al., 2021). The capacity to discern valuable opportunities amidst uncertainty and subsequently translate them into innovations within the market ultimately results in the realization of entrepreneurial profits upon reflection (Wach & Bilan, 2023). Creativity, which provides feasible and creative solutions to prevailing glitches, takes on a pivotal role in entrepreneurship, involving the development of novel business solutions (Bignetti et al., 2021). Within this context, individuals who harbor a greater entrepreneurial passion tend to exhibit heightened creativity in pursuit of their goals (Murad et al., 2021).

Women are primarily known for their role as mothers, sisters, or daughters and are restricted to see themselves as dominant, independent, and task-oriented, which are vital for choosing entrepreneurship as a career option (Chasserio et al., 2014). Vivid social identities block women entrepreneurs from perceiving themselves negatively in becoming successful entrepreneurs (Swail & Marlow, 2018). As per the research conducted by Filter (2020), gender identity does not stimulate passion, and thus, men and women experience similar passion towards becoming an entrepreneur. In light of these premises, the current study endeavors to assess the influence of EA on EIs, focusing on the mediating effects of passion and creativity. The study focuses on female engineering students, addressing the underrepresentation of women in entrepreneurship, particularly in Science, Technology, Engineering, and Mathematics (STEM) related fields. Understanding female students' entrepreneurial attitudes and intentions is crucial for promoting gender diversity in entrepreneurship. The

research is conducted within the context of engineering education. This is important as it explores the link between academic disciplines (engineering) and entrepreneurial attitudes. Insights from this study can inform educational institutions on how to foster an entrepreneurial mindset among female engineering students.

Analyzing entrepreneurial attitudes is essential for identifying the predisposition of individuals toward entrepreneurship. This information can be valuable for designing interventions and educational programs to cultivate a positive entrepreneurial mindset among female engineering students. Understanding the intentions of female engineering students to pursue entrepreneurship provides insights into the potential future landscape of entrepreneurship. Identifying factors influencing these intentions is critical for developing targeted strategies to support and encourage female students in their entrepreneurial endeavors. Including passion and creativity as mediating factors adds depth to the study. Investigating how these factors mediate the relationship between entrepreneurial attitude and intentions can provide nuanced insights. The findings of this research can have implications for policy development. Policymakers can use the insights to tailor policies that specifically address the needs and challenges faced by female engineering students aspiring to become entrepreneurs. This may include targeted support programs, mentorship initiatives, or curriculum adjustments. The study contributes to the existing body of knowledge on entrepreneurship, particularly in the context of female representation in STEM fields. It adds empirical evidence and insights into the factors influencing entrepreneurial attitudes and intentions, which can be valuable for researchers, educators, and policymakers in the field.

This research consists of five main sections. The first section deals with the review of existing relevant research works relating to entrepreneurial attitude, entrepreneurial intentions, women entrepreneurship, passion, and creativity. Further, this section presents the hypotheses that are developed. The second section presents the research design, methodology, and data employed in this study. The third section exhibits a detailed analysis of the data and their results. Discussions of the study results are presented in the fourth section. The fifth section presents the conclusions derived from the results of the study.

Literature Review and Hypothesis Development

The undeniable contribution of entrepreneurship to a nation's economic progress is well-established. Entrepreneurs, through their adeptness at profit generation, poverty reduction, and job creation, serve as catalysts for a country's economic growth and prosperity (Anjum et al., 2021). Entrepreneurs who possess adaptability and forward-thinking capabilities play a pivotal role in enhancing their country's economic performance. Given the prominent role that entrepreneurship plays in fostering a nation's economic development, it becomes imperative for the government to actively encourage young individuals to engage in entrepreneurial pursuits (Jiatong et al., 2021). With increased participation in entrepreneurial activities, especially among youth, the potential for establishing more job-creating business ventures is significantly heightened (Dali et al., 2021). Entrepreneurship represents a career path chosen by select individuals (Nguyen et al., 2022), as it demands specific and notable attributes encompassing internal, external, contextual, and personal factors. Notably, not everyone embarks on the journey of entrepreneurship. Critical to this pursuit is entrepreneurial education, which exhibits a positive correlation with individuals' intentions to engage in entrepreneurial endeavors (Boahemaah et al., 2020; Al Ghafri & Malik, 2021; Hattab, 2014 and Fadli et al., 2020). Characterized as an individual's entrepreneurial aspirations, EI plays a pivotal role in steering entrepreneurial activities (Al Ghafri & Malik, 2021). EIs are significantly influenced by an individual's attitude, as posited by Ajzen in 1991. In view of research conducted on engineering students in Hong Kong, the findings showed that whereas entrepreneurship positively increased EA and EI, female students had lower EI than male students. The report recommends implementing fresh approaches to education in order to foster the growth of female entrepreneurs (Choitung et al., 2012). Intention is an innate sense of preference and interest in something or an activity without external influence. Interest signifies the acknowledgment of a connection between oneself and an external entity. Intentions are instances and inclinations that strongly align with a perceived necessity (Radiman et al., 2021). Entrepreneurial intentions are the initial stage in establishing a typically long-term commercial venture (Radiman et al., 2021). In essence, an entrepreneurial attitude captures an individual's cognitive and emotional disposition towards the realm of entrepreneurship (Amofah & Saladrigues, 2022).

Crucially, entrepreneurial passion stands as a distinctive trait inherent to every entrepreneur (Biraglia & Kadile, 2017a). This form of passion signifies an intense and positive sentiment directed at entrepreneurial pursuits (Cardon & Kirk, 2015). Entrepreneurial passion serves as a motivational force driving engagement in entrepreneurial endeavors (Murad et al., 2021). Passion is significant when the entrepreneurial ecosystem is less positive (Cardon et al., 2009). The data gathered from female undergraduate students highlighted the favorable relationship between entrepreneurial self-assessment and EI, underscoring the significance of cultivating an entrepreneurial mentality to foster entrepreneurial passion and intention (Manjaly et al., 2022). Notably, EP holds a positive influence on EIs (Moses et al., 2016). Creativity, on the other hand, pertains to the generation of novel and viable concepts (Biraglia & Kadile, 2017a). This creative capacity is integral to entrepreneurial intent (Biraglia & Kadile, 2017a). Moreover, EP acts as an enhancer of creativity (Murad et al., 2021). Entrepreneurs surmount obstacles, persevere through failures, and utilize Entrepreneurial Passion (EP) as a driving force. EP serves as a source of motivation and a means of turning their concepts into tangible realities (Saboor et al., 2020). Entrepreneurial passion plays a pivotal role as a motivating force and a key factor in fostering entrepreneurial intentions (Oktavio et al., 2023). Passion is intricately linked to the concept of identity in the pursuit of entrepreneurial objectives. Individuals with a strong passion are also more inclined to express interest in initiating their businesses (Ferreira-Neto et al., 2023).

Creativity holds special significance in the realm of entrepreneurship, where entrepreneurship itself can be viewed as an inherently creative endeavor. Within the context of entrepreneurship from a cognitive perspective, there is a crucial emphasis on the cognitive elements that enable individuals to perceive and capitalize on opportunities when embarking on new business ventures. This perspective emphasizes creativity that allows individuals to generate innovative ideas and fosters the development of entrepreneurial intentions (EI). Entrepreneurial creativity stands out as a fundamental component of entrepreneurship because individuals must possess creativity to effectively identify and seize opportunities in the entrepreneurial landscape (Ediagbonya, 2023). Creativity translates fresh, ingenious, and imaginative ideas into reality, demanding both enthusiasm and unwavering dedication (Dali et al., 2021). Individuals with creative prowess not only derive personal satisfaction but also tend to excel in various aspects of their lives, cultivating positive relationships with

colleagues, customers, and even family members. Such individuals readily extend their cooperation to support entrepreneurs in activities like information gathering and resource sharing, indirectly contributing to the expansion of entrepreneurs' market presence and profitability (Nguyen et al., 2021). Creative individuals can also bolster their self-esteem and self-confidence through their entrepreneurial activities, powered by a sense of accomplishment that drives success in their business ventures (Waele, 2020). Despite numerous prior studies predominantly emphasizing that entrepreneurial passion or one's attitude toward entrepreneurship serves as the primary predictor of entrepreneurial intention, there remains a gap in the cause-and-effect relationship between creativity and EIs (Wathanakom et al., 2020).

The extant research works demonstrate the interconnectedness of EIs, attitude, passion, and creativity. Although numerous studies have explored these variables within the entrepreneurial context, there remains a dearth of research, particularly in the Indian context, concerning the role of attitude, passion, and creativity in shaping individuals' EIs. The present research work endeavors to address this research gap. Specifically, it seeks to analyze the impact of EA on the EIs of female engineering students in India, keeping passion and creativity as mediators. In alignment with the study's objectives, hypotheses are framed, and Figure 1 depicts the research model.

Hypothesis 1*: The EA of engineering students has a significant impact on their EI.*

Hypothesis 2: *Passion serves as a significant mediator in the relationship between EA and EI.*

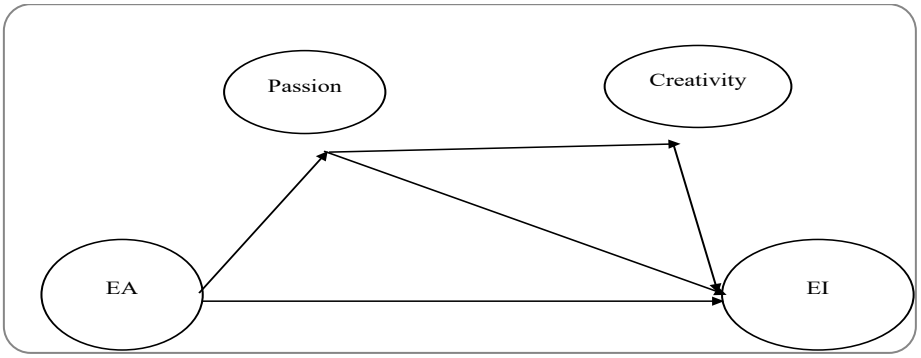
Hypothesis 3: *Creativity plays a significant mediator in the relationship between EA and EI.*

Hypothesis 4: *Passion and Creativity jointly have a mediating role in the relationship between EA and EI.*

Here, the impact of EA of engineering students on EIs is measured through the validated scales and analyzed using regression analysis. The mediation role of passion between EA and EIs was analyzed using the mediation analysis of Hayes' PROCESS model 4. The mediation role of creativity between EA and EIs is analyzed using the mediation analysis of Hayes' PROCESS model 4. Finally, the joint mediation roles of passion and creativity between EA and EIs are analyzed using the mediation analysis of Hayes' PROCESS model 6 (Hayes, 2012). Further, the study focuses on the

research design in view of the identified hypothesis to fulfill the objectives of the undertaken study.

Figure 1: Proposed research model



Source: Authors own source

Research Methodology and Data

Research Design

This study employs a descriptive research design to investigate the relationships among EA, EP, creativity, and EIs. Descriptive research focuses on describing the characteristics or behaviors of female engineering students on EA, EP, creativity, and EIs. This research is conducted as a "cross-sectional study". A cross-sectional study is a type of observational research design that collects data from participants at a single point in time. Unlike longitudinal studies, which involve data collection over an extended period, cross-sectional studies provide a snapshot of a population at a specific moment.

Sample Design

The population under study comprises female engineering students across India, and the target population is "female engineering students in Bangalore." This selection is made due to practical considerations related to feasibility and cost-effectiveness. Bangalore has been chosen for its status as a prominent hub for start-ups and its concentration of higher education institutions. With more than 500,000 engineering students enrolled in various programs in Bangalore, it provides a suitable context for the

research. Considering that the population size falls between 75,000 and 1,000,000, the optimal sample size determined using a 95% level of significance is 382, according to Krejcie and Morgon's (1970) guidelines. Hence, the study's sample size is set at 382. In terms of the sampling technique, a judgment sampling approach is employed. This method involves selecting participants based on the judgment of their relevance to the objectives and criteria of the study.

Data and Methods

This study employs a survey method where primary data was collected from a sample of individuals through questionnaires or interviews. The primary data for this study is gathered from female engineering students, who constitute the study participants, through the administration of a structured questionnaire. The research instrument has two sections. “Section A” deals with capturing the personal characteristics of the respondents, while “Section B” is designed to gauge the central variables, including entrepreneurial attitude, passion, creativity, and entrepreneurial intentions. Established and validated scales are employed to measure these variables. The study operationalizes its constructs EA, EP, creativity, and EIs through the utilization of established measurement scales. Entrepreneurial attitude is measured by a scale developed by Fayolle & Gailly (2015). Entrepreneurial passion is quantified using the scale of Cardon et al. (2013). The creativity scale developed and validated by Biraglia & Kadile (2017) is employed in this study. Further, the scale of Liñán et al. (2011) is applied to measure the EI of female engineering students. The table consisting of the data sources is presented in Appendix (Table – 1A).

Preliminary Study

A pilot study has been conducted to assess the consistency of the measurement scales. In this preliminary phase, 55 responses were gathered from engineering students in Bangalore. The Cronbach's α scores for the variables, namely EA, EP, creativity and EIs, are 0.741, 0.862, 0.765, and 0.758, respectively. These α scores are acceptable, indicating good internal consistency and reliability of the measurement scales. With the confirmation of reliable measurement scales, the main study is subsequently undertaken.

Results and Analysis

The normality of constructs such as EA, EP, creativity, and EIs was evaluated through normality tests. The results of these tests indicated that these variables are not normally distributed. Regarding the demographic composition, the sample units were female students, where 57% of the respondents were between the ages of 17 and 24 years. Furthermore, 95.7% of the sampled engineering institutions were privately owned and situated in urban areas. An exploration of differences in perceptions regarding EA, EP, creativity, and EI was conducted. Non-parametric mean difference analyses were performed. The outcomes of these analyses suggest that EA, EP, and creativity among the surveyed respondents remain consistent across various individual features such as "gender, age, the branch of engineering study, and the type of engineering institution attended". No significant variation was observed in entrepreneurial intentions based on "age, the branch of engineering study, and type of engineering institution".

The mediating role of passion in the relationship between EA and EIs was checked using the PROCESS model 4 of Hayes (Hayes, 2012).

Table 1: Information on the model

Outcome Variable: Passion				
Correlation	regression	MSE	F-value	P-value
0.1325	0.1175	0.4097	5.8921	0.009

Source: Authors own source

Table 1 reveals that the overall model is significant (p-value: 0.009). This suggests that the relationships among the variables under examination are collectively meaningful. Moreover, according to Table 2, EA significantly impacts the level of passion exhibited by the sampled students. This indicates that the attitudes these students hold towards entrepreneurship have a noteworthy influence on the extent of their passion for entrepreneurial activities.

Table 2: Model

Outcome Variable: Passion				
Particulars	Coefficients	Standard Error	t-value	P-value
Constant	3.4155	0.3846	14.7149	0.000
EA	0.1279	0.0489	3.5961	0.009

Source: Authors own source

The mediating effect of students' passion is illustrated in Tables 3 and 4. The mediation model is significant (Table 3). It conveys that the mediation process involving EA and passion is meaningful and contributes to the understanding of the relationships under study.

Table 3: Information on the model

Outcome Variable: Entrepreneurial Intentions				
Correlation	Regression	MSE	F-value	P-value
0.6523	0.5961	0.1328	5273.4368	0.000

Source: Authors own source

The influence of EA and EP on the EIs of the sample units is detailed in Table 4. The results reveal that both EA and EP exert a significant impact on EIs. This implies that both of these factors occupy a substantial part in shaping the EIs of the students. The significance of the indirect effects from EA to EP (as demonstrated in Table 2) and from EP to EIs (as presented in Table 3) highlights the mediating role of EP in connecting EA with EIs. This further underscores the importance of passion as a mechanism through which entrepreneurial attitude affects EIs.

Table 4: Model

Outcome Variable: Entrepreneurial Intentions				
Particulars	Coefficients	Standard Error	t-value	P-value
Constant	0.5988	0.1693	3.6892	0.000
EA	0.8134	0.0438	22.5438	0.000
Passion	0.7091	0.0455	12.7281	0.000

Source: Authors own source

The analysis presented in Table 5 demonstrates that EA has a significant impact on the EIs of the students, accounting for 81.3% of the

variance. This outcome supports the first hypothesis, confirming that there is indeed a substantial and meaningful connection between EA and EIs among the student participants.

Table 5: Direct effect

Effect	Standard Error	t-value	P-value
0.8134	0.0438	22.5438	0.000

Source: Computed

The findings from Table 6 indicate that the total indirect effect of EP in EA and EI relation is 24.9%, and this effect is statistically significant. This supports the second hypothesis, providing evidence that passion indeed mediates the link between EA and EIs.

Table 6: Indirect effect

Mediator	Effect	Boot SE	Boot LLCI	BootULCI
Passion	0.2459	0.03897	0.2157	0.3128

Source: Computed

The results presented in Tables 1 to 6 collectively reveal that EA significantly influences EIs, and EP significantly mediates EA and EIs relation of the sampled students. The mediating role of creativity in EA and EIs relation of the sampled students was investigated by applying Hayes' PROCESS model 4 (Hayes, 2012).

Table 7: Information on the model

Outcome Variable: Creativity				
Correlation	regression	MSE	F-value	P-value
0.6905	0.4765	0.2130	346.269	0.000

Source: Authors own source

Tables 7 and 8 provide valuable insights into the analysis outcomes. Table 7 highlights the statistical significance of the overall model, signifying that the interconnections among the variables being studied collectively hold meaning. Meanwhile, Table 8 demonstrates a substantial correlation between entrepreneurial attitude and the level of creativity displayed by the surveyed students. This underscores the significance of

these students' entrepreneurial attitudes in shaping the extent of their creativity when engaging in entrepreneurial pursuits.

Table 8: Model

Outcome Variable: Creativity				
Particulars	Coefficients	Standard Error	t-value	P-value
Constant	1.0881	0.1564	6.9552	0.000
EA	0.7073	0.0380	18.608	0.000

Source: Authors own source

Table 9 and 10 depict the mediating role of students' creativity. Table 9 confirms the significance of the mediation model, indicating that the process of mediation involving entrepreneurial attitude and creativity holds significance and enhances our comprehension of the relationships being examined.

Table 9: Information on the model

Outcome Variable: Creativity				
Correlation	regression	MSE	F-value	P-value
0.7834	0.6136	0.1579	300.9800	0.000

Source: Authors own source

Table 10 provides a comprehensive account of how entrepreneurial attitude and creativity influence the EIs of the sample units. The results indicate that both entrepreneurial attitude and creativity wield significant influence over entrepreneurial intentions. This implies that these two factors substantially contribute to shaping the students' intentions to engage in entrepreneurial pursuits.

Furthermore, the noteworthy indirect effects observed in Table 8, from entrepreneurial attitude to creativity, and in Table 9, from creativity to entrepreneurial intentions, underscore the mediating function of creativity in bridging the gap between EA and EIs. This further emphasizes the critical role of creativity through which entrepreneurial attitude impacts EIs.

Table 10: Model

Outcome Variable: Entrepreneurial Intentions				
Particulars	Coefficients	Standard Error	t-value	P-value
Constant	0.8587	0.1430	6.0041	0.000
EA	0.9183	0.0452	20.2968	0.000
Creativity	-0.1786	0.0442	-4.0443	0.000

Source: Authors own source

The data presented in Table 11 showcases that EA significantly influences the EIs of the students, explaining 91.83% of the variance. This result validates the first hypothesis, providing strong evidence for the existence of a substantial and meaningful connection between EA and EIs of the student participants.

Table 11: Direct effect

Effect	Standard Error	t-value	P-value
0.9183	0.0452	20.2968	0.000

Source: Computed

The results presented in Table 12 reveal that the overall indirect impact of creativity in the connection between EA and EIs amounts to -12.63%, and this impact is statistically significant, albeit in a negative direction. This lends support to the third hypothesis, offering evidence that creativity does act as a mediator in the relationship between entrepreneurial attitude and entrepreneurial intentions.

Table 12: Indirect effect

Mediator	Effect	Boot SE	Boot LLCI	BootULCI
Creativity	-0.1263	0.0298	-0.1861	-0.0690

Source: Computed

The findings from Tables 7 to 12, taken together, demonstrate that entrepreneurial attitude indeed exerts a significant influence on entrepreneurial intentions, and creativity effectively serves as a significant mediator in the EA and EIs relation of the surveyed students.

From the above results, one can understand that EP significantly and positively mediates the EA and EIs relation of the sample units. However,

the prime relationship is better than the mediating relationship of passion. On the other hand, creativity significantly and negatively mediates the EA and EIs relation of the sample units. The prime relationship is better than the mediating relationship of creativity. This study also hypothesized that passion and creativity jointly have a mediating role in EA and EIs relations. This investigation was conducted using the PROCESS model 6 developed by Hayes (Hayes, 2012). Tables 13 and 14 depict the mediating roles of passion and creativity. Table 13 confirms the significance of the mediation model, indicating that the process of mediation involving entrepreneurial attitude and creativity holds significance and enhances our comprehension of the relationships being examined.

Table 13: Information on the model

Outcome Variable: Entrepreneurial Intentions				
Correlation	regression	MSE	F-value	P-value
0.7843	0.6151	0.1577	201.3654	0.000

Source: Authors own source

Table 14 provides a comprehensive account of how EA, EP, and creativity affect the EIs of the sampled students. The findings indicate that EA, EP, and creativity wield significant influence over EIs. This implies that these three factors substantially contribute to shaping the students' intentions to engage in entrepreneurial pursuits.

Table 14: Model

Outcome Variable: Entrepreneurial Intentions				
Particulars	Coefficients	StandardError	t-value	P-value
Constant	0.7366	0.1755	4.1973	0.000
EA	0.9187	0.0452	20.3167	0.000
Passion	0.7852	0.0389	21.2369	0.000
Creativity	-0.1867	0.0446	-4.1810	0.000

Source: Authors own source

The data presented in Table 15 showcases that EA significantly influences the EIs of the sample units, explaining 91.87% of the variance. This result validates the first hypothesis, providing strong evidence for the existence of a substantial and meaningful connection between EA and EIs of the student participants.

Table 15: Direct effect

Effect	Standard Error	t-value	P-value
0.9187	0.0452	20.3167	0.000

Source: Computed

Table 12: Indirect effects

Particulars	Effect	Boot SE	Boot LLCI	BootULCI
Total	-0.1267	0.0298	-0.1863	-0.0671
EA →Passion→EI	0.0053	0.0054	-0.0033	-0.0183
EA→Creativity→EI	0.1293	0.0295	-0.1888	-0.0714
EA→Passion→Creativity→EI	0.0028	0.0018	-0.0074	-0.0003

Source: Computed

Indirect effects convey that overall, there is a negative effect of 12.67% in EA and EIs of the students. Passion positively and creativity negatively contribute to the prime relation. However, the negative effect is brought down when both passion and creativity jointly mediate the relationship between EA and EIs of the students.

Discussion

The findings provide valuable insights into the relationship between various factors and the EIs of engineering students. It's worth noting that the variables examined, including entrepreneurial attitude, passion, creativity, and entrepreneurial intentions, did not follow a normal distribution. This suggests that the data may not conform to a typical statistical pattern, which should be considered when interpreting the results. Predominantly, the sample units were female, and a significant portion fell within the 17 to 24 years age range. Additionally, most of the surveyed engineering institutions were privately owned and located in urban areas. These demographic characteristics provide context for the study's sample composition. The study found that entrepreneurial attitude, passion, and creativity remained consistent across various personal characteristics such as "gender, age, the branch of engineering study, and type of engineering institution". This suggests that these factors are relatively stable within the surveyed student population, regardless of individual differences. Notably, there was a significant difference in EIs based on gender, with implications for tailoring

entrepreneurial programs and interventions to address potential gender-related disparities in entrepreneurial aspirations.

The study investigated the mediating role of passion and creativity in EA and EIs relations. Passion was found to positively mediate this relationship, albeit with a smaller effect compared to the direct relationship between EA and EIs. On the other hand, creativity negatively mediated the relationship, emphasizing the need for further exploration into how creativity can be harnessed to enhance EIs. The study also hypothesized that passion and creativity jointly mediate the relationship between EA and EIs. Interestingly, while passion continued to have a positive effect, creativity's negative effect was attenuated when both factors were considered together. This suggests a complex interplay between passion and creativity in shaping entrepreneurial intentions.

Importantly, entrepreneurial attitude was found to have a substantial impact on EIs, explaining a significant portion of the variance. This underscores the significance of fostering a positive entrepreneurial mindset among female students to drive their intentions toward entrepreneurship. Additionally, cultivating creativity may be a valuable strategy to further promote entrepreneurial intentions among female students. This research work contributes to our understanding of the factors influencing EIs among female engineering students. It highlights the roles of passion, creativity, and demographic factors in shaping these intentions and emphasizes the importance of nurturing entrepreneurial attitudes to foster future entrepreneurial activities. Collectively, these findings have implications for entrepreneurship education and policy. Institutions can design programs that leverage and enhance students' existing passion for entrepreneurship while also addressing potential gender-based differences.

Conclusion

The research findings unveil several key conclusions. Gender, age, academic discipline, type of educational institution, and institutional location do not significantly impact the entrepreneurial attitude, entrepreneurial passion, or creativity of female engineering students. However, there is a noteworthy variation in entrepreneurial intentions based on gender, suggesting that male and female students may differ in their inclination toward entrepreneurial pursuits. Entrepreneurial attitude has a significant and positive effect on the entrepreneurial intentions of female

students. This highlights the pivotal role that a positive attitude toward entrepreneurship plays in motivating students to consider entrepreneurial ventures. While passion positively mediated the relationship, creativity had a negative mediating effect. These results underscore the complexity of how passion and creativity interact in influencing EIs. The joint mediation analysis revealed that when both passion and creativity are considered together, the negative effect of creativity is attenuated. This suggests that passion plays a more dominant role in shaping EIs when combined with creativity. In conclusion, this study advances the understanding of the multidimensional relationship between EA, passion, creativity, and demographic factors in shaping the EIs of engineering students. While it underscores the importance of fostering a positive entrepreneurial mindset, it also highlights the need for nuanced approaches to address gender disparities and harness the combined power of passion and creativity in promoting EIs. Further research could explore strategies to harness and enhance both passion and creativity to promote entrepreneurial intentions more effectively.

References

[1] **Al Ghafri, F., & Malik, M.** (2021). Entrepreneurship education and its effect on entrepreneurial intentions of Omani undergraduate students. In *SHS Web of Conferences* (Vol. 124, p. 05005). EDP Sciences.

[2] **Amofah, K., & Saladrigues, R.** (2022). Impact of attitude towards entrepreneurship education and role models on entrepreneurial intention. *Journal of Innovation and Entrepreneurship*, 11(1), 36.

[3] **Anjum, T., Farrukh, M., Heidler, P., & Tautiva, J. A. D.** (2021). Entrepreneurial intention: Creativity, entrepreneurship, and university support. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 1–13. https://doi.org/10.3390/joitmc7010011

[4] **Bignetti, B., Santos, A. C., Hansen, P. B., & Henriqson, E.** (2021). The influence of entrepreneurial passion and creativity on entrepreneurial intentions. RAM. *Revista de Administração Mackenzie, 22*, eRAMR210082.

[5] **Biraglia, A., & Kadile, V.** (2017). The Role of Entrepreneurial Passion and Creativity in Developing Entrepreneurial Intentions: Insights from American Homebrewers. *Journal of Small Business Management*, *55*(1), 170–188. https://doi.org/https://doi.org/10.1111/jsbm.12242

[6] **Cardon, M. S., Gregoire, D. A., Stevens, C. E., & Patel, P. C.** (2013). Measuring entrepreneurial passion: Conceptual foundations and scale validation. *Journal of Business Venturing*, *28*(3), 373–396.

https://doi.org/10.1016/j.jbusvent.2012.03.003

[7] **Chasserio, S., Pailot, P., & Poroli, C.** (2014). When entrepreneurial identity meets multiple social identities : Interplays and identity work of women entrepreneurs. *International Journal of Entrepreneurial Behavior & Research, 20*(2), 128-154.

[8] **Choitung, L., Sun, H., & Law, K**. (2012). Comparing the Entrepreneurial Intention between Female and Male Engineering Students. *Journal of Women's Entrepreneurship and Education, 1*(2), 28-51. Retrieved from https://library.ien.bg.ac.rs/index.php/jwee/article/view

[9] **Dali, F., Hashim, H., Halid, R. A., Khalid, Aziah, N., & Kadir, A.** (2021). Creativity and Youth Entrepreneurial Intention: A Conceptual Model. *Insight Journal*, *8*(3), 83–104.

[10] **Ediagbonya, K.** (2023). Entrepreneurship Education, Entrepreneurial Creativity and Entrepreneurial Mindset As Correlates of Business Education Students' Entrepreneurial Intention in Edo State. *Asian Journal of Vocational Education and Humanities*, *4*(2), 15–21. www.mjosteve.com

[11] **Fayolle, A., & Gailly, B.** (2015). The Impact of Entrepreneurship Education on Entrepreneurial Attitudes and Intention: Hysteresis and Persistence. *Journal of Small Business Management*, *53*(1), 75–93. https://doi.org/10.1111/jsbm.12065

[12] **Ferreira-Neto, M. N., de Carvalho Castro, J. L., de Sousa-Filho, J. M., & de Souza Lessa, B.** (2023). The role of self-efficacy, entrepreneurial passion, and creativity in developing entrepreneurial intentions. *Frontiers in Psychology*, *14*(March), 1–14. https://doi.org/10.3389/fpsyg.2023.1134618

[13] **Filter, H.** (2020). *Investigating the Influence of Gender on the Experience of Entrepreneurial Passion: A Quantitative Study*. Retrieved from University of twente student theses http://essay.utwente.nl/81854/

[14] **Gerba, D.** (2012). Impact of entrepreneurship education on entrepreneurial intentions of business and engineering students in Ethiopia. *African Journal of Economic and Management Studies*.

[15] **Gure, G.** (2017). Gender Influences on the Entrepreneurial Tendencies & Entrepreneurial Attitude of University Students. *International Journal of Research in Social Sciences, 8*, 746-759.

[16] **Hayes, J. R.** (2012). Modelling and remodelling writting. *Written Communication*, 369-388. Retrieved from https://doi.org/10.1177/0741088312451260

[17] **Jiatong, W., Murad, M., Bajun, F., Tufail, M. S., Mirza, F., & Rafiq, M.** (2021). Impact of Entrepreneurial Education, Mindset, and Creativity on Entrepreneurial Intention: Mediating Role of Entrepreneurial Self-Efficacy. *Frontiers in Psychology*, *12*(August), 1–13. https://doi.org/10.3389/fpsyg.2021.724440

[18] **Law, K., & Breznik, K.** (2017). Impacts of innovativeness and attitude on entrepreneurial intention: Among engineering and non-engineering students. *International Journal of Technology and Design Education, 27*(4), 683-700.

[19] **Liñán, F., Rodríguez-Cohard, J. C., & Rueda-Cantuche, J. M.** (2011). Factors affecting entrepreneurial intention levels: a role for education. *International Entrepreneurship and Management Journal*, *7*(2), 195–218. https://doi.org/10.1007/s11365-010-0154-z

[20] **Manjaly, N. B., Joseph, G., P.M., N., & Kailash, N.** (2022). Entrepreneurial Intention of Indian Women University Students: The Role of Entrepreneurial Self-Assessment and Entrepreneurial Passion. *Journal of Women's Entrepreneurship and Education, 3*(4), 273-290. Retrieved from https://www.library.ien.bg.ac.rs/index.php/jwee/article/view/1508/1296

[21] **Moses, C. L., Olokundun, M. A., Akinbode, M., Agboola, M., & Inelo, F.** (2016). Entrepreneurship education and entrepreneurial intentions: The moderating role of passion. *The Social Sciences*, 11(5), 645-653.

[22] **Murad, M., Li, C., Ashraf, S. F., & Arora, S.** (2021). The influence of entrepreneurial passion in the relationship between creativity and entrepreneurial intention. *International Journal of Global Business and Competitiveness*, 16(1), 51-60.

[23] **Nguyen, T. T., Phan, H. T. T., & Pham, V. T.** (2021). Impact of creativity on student entrepreneurial intention. *International Journal of Innovation*, *9*(3), 646–663. https://doi.org/10.5585/iji.v9i3.19659

[24] **Oktavio, A., Mitasari, R., Sinarta, Y., Kusumawidjaya, E., Wijaya, V., & Widyawati, C.** (2023). Indonesian Students' Entrepreneurial Behavior: The Effect of Creativity, Passion, Alertness and Intention. *Journal of Eastern European and Central Asian Research*, *10*(2), 227–237. https://doi.org/10.15549/jeecar.v10i2.1039

[25] **Radiman, Sukiman, & Rizal Agus.** (2021). The Influence of Creativity and Proactive Attitude Towards Entrepreneurial Intentions of Students at Islamic Colleges Private in Medan City. *IHTIFAZ: Islamic Economics, Finance, and Banking*, *6*(6), 196–205. http://seminar.uad.ac.id/index.php/ihtifaz/article/view/6055

[26] **Saboor, M. J., Yousaf, I., & Paracha, A.** (2020). Entrepreneurial Passion and Intention: Creativity and Perceived Behavioral Control as Mediators. *Journal of Managerial Sciences*, *14*(2), 11–19.

[27] **Setia, B., & Nuringsih, K.** (2022). Shaping Intention among Students in Environmental Entrepreneurship through Entrepreneurial Education and Environmental Concern. In *Tenth International Conference on Entrepreneurship and Business Management 2021* (ICEBM 2021) (pp. 109-115). Atlantis Press.

[28] **Swail, J., & Marlow, S.** (2018). Embrace the masculine; attenuate the feminine' – gender, identity work and entrepreneurial legitimation in the

nascent context. *Entrepreneurship & Regional Development, 30*(1-2), 256-282. https://doi.org/10.1080/08985626.2017.1406539

[29] **Thuy, D. T. T., Linh, N. T. C., & Thanh, N. N. D.** (2020). The mediating role of passion in entrepreneurship intention: Identity centrality and role models increase passion. *Hcmcoujs - Economics and Business Administration*, *10*(1), 101–119. https://doi.org/10.46223/hcmcoujs.econ.en.10.1.223.2020

[30] **Wach, K., & Bilan, S.** (2023). Creativity of Students in Favour of Their Entrepreneurial Intentions: Empirical Evidence From Poland. *Creativity Studies*, *16*(1), 211–224. https://doi.org/10.3846/cs.2023.15028

[31] **Waele, S. De.** (2020). *The Relationship between Creativity and Entrepreneurial Intentions*.

[32] **Wathanakom, N., Khlaisang, J., & Songkram, N.** (2020). The study of the causal relationship between innovativeness and entrepreneurial intention among undergraduate students. *Journal of Innovation and Entrepreneurship*, *9*(1), 1–13. https://doi.org/10.1186/s13731-020-00125-5

[33] **Yordanova, D., & Tarrazon, M.** (2010). Gender differences in entrepreneurial intentions: Evidence from Bulgaria. *Journal of Developmental Entrepreneurship, 15*(03), 245-261.

Appendix

Table 1A : Scales employed to collect data

Particulars	Scale	Authors	Total items
Entrepreneurial attitude(EA)	EA scale	Fayolle & Gailly (2015)	6
Entrepreneurial Passion(EP)	EP scale	Cardon et al., (2013)	13
Creativity	Creativity scale	Biragalia & Kadile (2017)	4
Entrepreneurial Intentions (EIs)	EIs scale	Liñán et al., (2011)	6

Article history: Received: September 22nd, 2023
Accepted: December 25th, 2023

DOI: 10.28934/jwee24.12.pp40-65
JEL: M13

ORIGINAL SCIENTIFIC PAPER

The Effect of Science & Technology Park, Market Segregation and Commercialization Support on Female Entrepreneurship in Pakistan: A Moderating Role of Economic Climate

Muhammad Murad [1]
Shahrina Binti Othman [2]
Muhamad Ali Imran Bin Kamarudin [3]
Universiti Utara Malaysia, College of Business, School of Business Management, Sintok, Malaysia

A B S T R A C T

Female students have few opportunities and training to develop their entrepreneurial careers in developing economies. The existing literature also provides little discussion of linking women's entrepreneurial intention with their entrepreneurial careers. The researchers addressed the gaps in the literature by empirically confirming the impact of science and technology parks, market segregation, and commercialization support on female students' entrepreneurship in Pakistan. The study also tested the moderating role of the economic climate on the relationship between science and technology parks, market segregation, commercialization support, and female students' entrepreneurship. We used a survey-based data collection approach, and a Likert scale questionnaire was administered. The study used data collected from 247 female students registered in business incubators. The research findings are new in the literature and confirm

[1] Corresponding author, e-mail: murad_m@cob.uum.edu.my
[2] E-mail: shahrina.othman@uum.edu.my
[3] E-mail: aliimran@uum.edu.my

the science & technology park, market segregation and commercialization support are significant antecedents that influence the entrepreneurial intention of female students in Pakistan. The impact of female students' entrepreneurial intention is positive on their entrepreneurship careers. Meanwhile, the economic climate is established as a negative moderator between female students' entrepreneurial intention and their entrepreneurial careers in Pakistan. We recommend that policymakers develop the science & technology park, market segregation and commercialization support for female students to grow their entrepreneurial careers.

KEYWORDS: *science & technology park, market segregation, commercialization support, entrepreneurship, economic climate*

Introduction

The females in Pakistan are not financially strong compared to the females in Western and developed countries (Waqas & Awan, 2019). Apart from their social deprivation, women have fewer opportunities to start a business in Pakistan (Ukwueze, 2022). Undoubtedly, females in Pakistan have opportunities to study (Rafiq et al., 2020) and work in the corporate sector (Salahuddin et al., 2022). Still, they are less trained for their business development. Females in Pakistan compose half of the population, according to the recent census in June 2023. On the other hand, it is proved by developed economies like Malaysia (Lim et al., 2019), America (García-Holgado et al., 2019), Canada (Lieu et al., 2020) and Australia (Churchill & Craig, 2019) that women's role is necessary for economic development. The so-called religious barriers for women-owned businesses have been thrown away from Pakistani society for the last decade (Hatoum et al., 2023). The women in Pakistan are fighting for their rights to education and financial independence (Safdar & Yasmin, 2020). However, practically, it is a problem to advance women's role in Pakistan's economic growth.

The overall situation of entrepreneurial businesses in Pakistan is challenging (Ahmad et al., 2022). According to the Global Entrepreneurship Index (GEI) (2019), Pakistan ranks 109th among 137 countries. Furthermore, the Global Entrepreneurship Monitor (GEM) (2019) also reported Pakistan as the last among 50 countries. These assessments collectively affirm that the state of entrepreneurship in Pakistan is suboptimal. Furthermore, there is a notable gender disparity, with females in Pakistan showing lower participation rates in entrepreneurship (Gul et al.,

2021). There is a severe need for women's entrepreneurship culture in Pakistan to support its struggling economic condition, as Pakistan signed its 23rd financial support program with the International Monetary Fund (IMF). The equal participation of women in entrepreneurship could support Pakistan's economy (Tara et al., 2020).

Different researchers presented multiple factors for women's entrepreneurship. Kapoor (2019) asserted that it was important to support women financially to improve their entrepreneurial businesses. Rudhumbu et al. (2020) pointed out women should have entrepreneurial education, and Welsh et al. (2021) reported that family support is necessary for women's entrepreneurial businesses. Meanwhile, Nasir et al. (2019) highlighted that women's entrepreneurship can be improved in Pakistan by entrepreneurial education and entrepreneurial networking support. Indeed, these researchers highlighted the critical aspects of women's entrepreneurial intention. However, there are gaps in the body of knowledge regarding the role of women in entrepreneurship. Therefore, Afshan et al. (2021) highlighted that future studies on women's entrepreneurship must determine further facts that could influence their entrepreneurial intention. Solesvik et al. (2019) stressed that women's entrepreneurship needs to be investigated more in developing economies.

The above-discussed practical and literature gaps are the motivation for this research. The researchers aimed to contribute to the entrepreneurial careers of women. The existing literature is reviewed extensively, and it is identified that no study before this research has tested the direct effect of science & technology parks, market segregation opportunities and commercialization support on women's entrepreneurial intention (Drakpa et al., 2022). Furthermore, the studies in the literature reported inconsistency in the relationship between entrepreneurial intention and entrepreneurial career. Therefore, the researchers also aimed to test this relationship in the economic climate of Pakistan. From its novelty perspective, the research confirmed that the role of science & technology parks, market segregation, and commercialization support is significant in influencing female students' entrepreneurship intention and careers in Pakistan. However, the research also confirmed that the struggling economy negatively affects the relationship between female students' entrepreneurial intentions and careers. This research paper will serve to close a loop in the literature. The scope of this study is limited to women entrepreneurship, and the female students in

business incubators of Pakistani universities are surveyed for empirical findings.

Theoretical Underpinning and Hypotheses Development

The model of this research is underpinned by stimulus-organism-response (SOR) theory. According to this theory, external stimulus is a factor that influences the individual's internal state. Similarly, the internal state significantly affects the response or leads to consequences (Zhang et al., 2021). According to Anwar et al. (2023), this theory highlights that the reaction of individuals is influenced by their interaction between external stimuli and their internal state. To begin with, science and technology parks, market segregation and commercialization support are external factors that are considered as stimulus. Furthermore, entrepreneurial intention is an internal variable that is regarded as an organism. Accordingly, the entrepreneurial career is the final stage, which is considered a response in this research. The economic climate as a moderator is supported by a relational theory of risk presented by Boholm and Corvellec (2011). This theory conceptualized economic climate as a risk object for the relationship between female' entrepreneurial intention and behavior, which is considered as an object at risk. Therefore, this theory is considered to test the relationship of risk. The developed research model is graphically shown in Figure 1.

Youssef et al. (2021) reported that innovation is critical to entrepreneurial development. In this way, entrepreneurs must bring innovation to the market in the development of products and services. Tomy and Pardede (2020) pointed out that rich countries have innovation in product development based on their technological advancement. However, the students with innovative approaches are also good at performing with innovation. Ahmed et al. (2019) emphasized that the role of scientific innovation is necessary for entrepreneurial development as it serves to improve the quality of products and services. Meanwhile, Tajpour and Hosseini (2021) concluded that without innovation, there is no success in entrepreneurial business in the market. Fresh entrepreneurs' role is to first develop a unique product and service for targeting a market; otherwise, their business will not thrive (Kaya, 2021). Sansone et al. (2021) demonstrated that the role of science & technology is critical in developing products and services that are necessary to serve the market's needs. Basically, the

innovation of products is critically important for the target market, and it is possible with new product development. Hence, Yi (2021) rightly reported on the necessity of a science & technology park for bringing innovation. From the perspective of technology parks, McAdam and McAdam (2008) concluded that university science park incubators are critical for students' approaches towards entrepreneurship. The research by Barbero et al. (2014) emphasized that integrating technology parks in business incubators is helpful for students to develop their entrepreneurial mindset. Additionally, Guerrero et al. (2018) reported that establishment of technology parks is necessary for the start-up of graduates. The above discussion leads to the following hypothesis.

> ***Hypothesis (H1):*** *In Pakistan, university science & technology parks have a positive influence on the entrepreneurial intention of female students.*

Olanrewaju et al. (2020) demonstrated that the appropriate market selection for product and delivery is necessary for market capturing. Market segregation is essential for any business before launching a product or service. It is required to find the right market to deliver the right product and service (Hameed & Irfan, 2019). The marketing department's responsibility in any business is critical for finding the opportunity in the market and designing a product according to the market's requirements. Quinn and Woodruff (2019) pointed out that entrepreneurship is based on marketing strategies, and selecting the right call for product delivery makes business successful. However, the segregation of the market is a complicated process, requiring effort to have opportunity for it. Anwar et al. (2022) asserted that market requirements for service delivery are achieved when successful business plans are established. Therefore, market segmentation is a critical process, as reported by Roundy and Fayard (2019), and businesses should be developed according to the market's requirements (Méndez-Picazo et al., 2021). The students with entrepreneurial ideas have little understanding of the complex dynamics of the market (Biancone et al., 2022). However, the proper market selection tools can help them to define the market and design the product and service accordingly. The above discussion leads to the following hypothesis.

> ***Hypothesis (H2):*** *In Pakistan, university support for market segregation opportunities positively influences female students' entrepreneurial intention.*

Support for the commercialization of products and services is critical for the development of any business (Audretsch & Belitski, 2021). The commercialization of business is a process of sustainable working in the market. Indeed, without the commercialization of products and services, the business's sales declined (Fasi, 2022). Hassan (2020) pointed out that the modern market is based on intense competition, and reliable working opportunities are necessary to develop business planning. However, Leitner et al. (2021) reported that creative advertisement is required for the newly formed business to capture the market. However, different researchers focused on promotions (Hsieh & Wu, 2019), free products (Duval-Couetil et al., 2021) and testing the product physically for commercialization (Hayter et al., 2021). Students with entrepreneurial ideas have less information about product commercialization in the market (Daneshjoovash et al., 2021). The failure to commercialize the product in the right way can lead the businesses in a negative direction (Yulianto et al., 2023). Hence, business plans and commercialization of business could serve to advance business ventures (Rukmana et al., 2023). However, Lyken-Segosebe et al. (2020) pointed out that most entrepreneurs lack efficiency in commercialization, limiting the reach of their products in the market. Entrepreneurs are required to commercialize their products to reach the customers (Rahman et al., 2022). The above discussion leads to the following hypothesis:

> ***Hypothesis (H3):*** *In Pakistan, university commercialization support positively influences female students' entrepreneurial intention.*

There is a debate among scholars regarding the role of entrepreneurial intention in starting a business. Some scholars pointed out that entrepreneurial intention is appropriate for starting a business (Neneh, 2022). However, some scholars claim that intention alone is not the final factor in starting a business, rather, multiple factors can influence it (Meoli et al., 2020). A few scholars reported that entrepreneurs' intentions have changed over time based on their personality traits (Liu et al., 2019). It is reported that males have a stronger intention to work for business startups than females (Nowiński et al., 2019), but different factors also influence this intention. Therefore, this open discussion in other scholarly works opens a loop in the literature. Meanwhile, Lestari et al. (2022) pointed out that the entrepreneurial intention should be long-term to achieve the entrepreneurial goals. Li et al. (2023) demonstrated that entrepreneurial intention is a significant factor for entrepreneurs. The research by Manjaly et al. (2022) confirmed that entrepreneurs without intention are less productive in

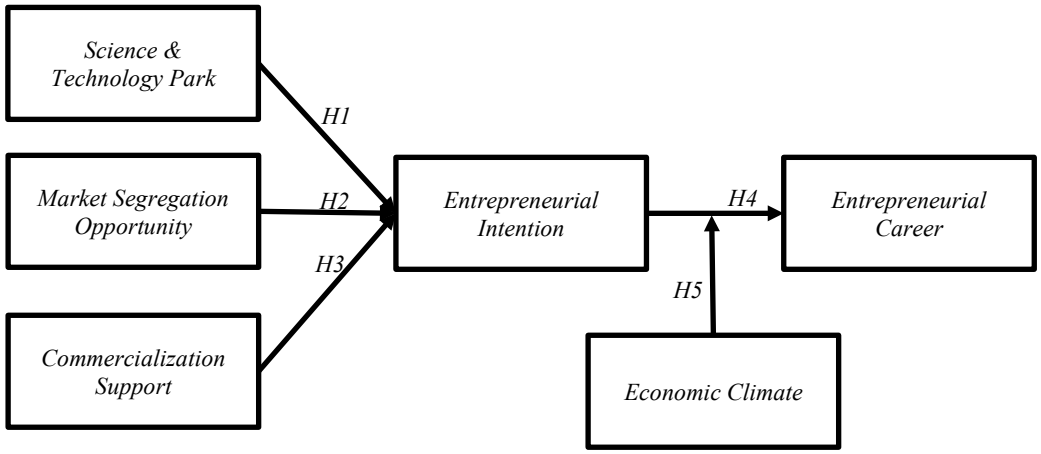
working for their businesses. The above discussion leads to the following hypothesis.

> ***Hypothesis (H4):*** *In Pakistan, students' entrepreneurial intention positively influences female students' entrepreneurial careers.*

The economic situation of any country serves as a ground for business startups (Galindo-Martín et al., 2021). Developed countries with solid economic environments are reliable for business startups because the students can obtain loans from financial institutions (Ratten, 2020). However, the dire economic condition is disturbing for the new businesses as the purchasing power of the customers is also disturbed (Gu et al., 2021). Many students fail to get financial support from their families during times of economic issues (Stoica et al., 2020). Therefore, the importance of the economic situation can't be ignored. Alameeri et al. (2021) pointed out that bad economic conditions affect any country's foreign direct investment (FDI). Meanwhile, Guerrero et al. (2021) highlighted that low economic conditions lead to business failure when the market crashes. While countries with high economic indicators, such as America, lead in entrepreneurial growth (Salvato et al., 2020), Pakistan, a poor country, has little entrepreneurial growth due to its bad economic condition (Ali et al., 2020). Therefore, the economic condition of a country plays a crucial role in shaping its entrepreneurial development. The financial situation of the country also influences the newly developed entrepreneurial businesses. The above discussion leads to the following hypothesis.

> ***Hypothesis (H5)****: In Pakistan, the economic climate moderates the relationship between female students' entrepreneurial intentions and careers.*

Figure 1: Proposed Research Model



Source: Authors

Methodology

The relationships developed in the proposed research model are tested with empirical findings. The researchers developed a questionnaire to collect primary data. The Likert scale questionnaire is designed based on 7-point items. The measurements for each variable are adopted from the existing studies. The variable science & technology part is operationalized to investigate the role of the science & technology parks in advancing female students' entrepreneurial intention. Similarly, the variable commercialization support is operationalized to determine if the commercialization support is appropriate to improve female students' entrepreneurial intention. Meanwhile, the variable market segregation opportunity is operationalized to determine if the market segregation support effectively influences female students' entrepreneurial intention. The variable student entrepreneurial intention is operationalized to examine if the entrepreneurial intention of female students is a strong predictor for their entrepreneurial careers. The variable entrepreneurial career is operationalized to determine the relationship between the entrepreneurial career of female students and their entrepreneurial intention. Finally, the construct economic climate is operationalized to test if the moderating role of economic climate threatens the relationship between female students' entrepreneurial intention and careers in Pakistan. The scale items are reported in Table 1.

Table 1: Measurement Scale

Variables	Measurement Scale
Science and Technology Park	My university provides technological support for my entrepreneurial ideas. My university has a relationship with other institutes to integrate technology in education. Scientific invention and the support of technology influence entrepreneurial ideas.
Market Segregation	My university helps me to target the appropriate market for my business. Professionals in business incubators support finding potential customers. I like the practical support of my institute for the segregation of the market. Entrepreneurial networking in business incubators is reliable for searching for a target market.
Commercialization Support	Business incubators help the commercialization of business ideas. I am confident about the commercialization strategy of my mentors. The product commercialization of my institute is useful to grow entrepreneurial business. I get alternative strategies for the commercialization of my business. Other students got product commercialization from business incubators.
Entrepreneurial Intention	I am ready to do anything to be an entrepreneur. My professional goal is to become an entrepreneur. I will make every effort to start and run my own firm. I am determined to create a firm in the future. I have very seriously thought of starting a firm. I have a firm intention to start a business someday.
Entrepreneurial Career	Product/service development is completed and ready for sale or delivery. Marketing or promotional efforts for the new venture have started. Major equipment, facilities, or property for the new venture are being purchased, leased, or rented.

Variables	Measurement Scale
	Raw materials, inventory, supplies, or components for the new venture are being purchased. I have begun investing my own money in the new venture. Other people or financial institutions are being asked for funds. Credit with a supplier has been established. I have begun devoting full-time (35 + hours per week) to the new venture. Employees have been hired for pay. A bank account exclusively for the new venture has been opened. The new venture has received income from the sale of a product/service. The new venture has been listed in the phone book (internet directory).
Economic Climate	I am happy to start a new business in the current economic climate. For me, starting up a business in the current recession is a serious barrier. Starting a business in the current economic climate would pose serious financial difficulties for me. I see the current economic climate as unfavorable for me to start a business.

Source: Authors

The scale for science and technology parks, market segregation opportunities and commercialization support are adapted from Salamzadeh et al. (2022). Meanwhile, the scale for entrepreneurial intention is adapted from Liñán and Chen (2009). The scale for an entrepreneurial career is adopted from Chen et al. (2018), and the economic climate is adopted from Nabi and Liñán (2013). The adopted scale items were considered reliable as the findings of existing studies already tested the reliability of these items. Therefore, Cronbach alpha for the scale of all variables was above 0.70, which reported the significance of available constructs. However, a panel of four reviewers from Pakistani universities considered a face validity test of the scale. The reviewers panel approved no modification in the content and scale for this research. Hence, the face validity of the adopted items in the Pakistani research context was also approved.

This probability sampling method is used for data collection, and female students enrolled in business incubators of 12 entrepreneurial universities in Punjab, Pakistan, were approached for the survey. The sampling frame was based on the registry of these business incubators, and 577 female students were enrolled in these business incubators out of 1639 students. According to Krejcie and Morgan (1970), when the total population is between 550 and 600 elements, a sample between 226 and 234 respondents is appropriate. The simple random sampling method is used to collect data as the population is known and shares similar traits for data collection. The students available in business incubators are asked randomly to fill out the questionnaire as per their volunteer participation. The questionnaires were printed and placed on respondents' desks in business incubators to get their responses. Only 300 questionnaires were distributed to collect the data, and subjects were given 20-30 minutes to complete the questionnaires. 247 responses were collected without any missing values and biased responses. Therefore, the study has used a sample of 247 subjects for empirical results. The data is incorporated into Microsoft Excel for further processing. The average of collected data for each variable's scale is determined in an Excel sheet to prepare the data for the statistical process. The study has used JASP 0.17.3.0 for data analysis. The findings of correlations between the variables and regression tests are performed to determine the empirical justifications for research objectives.

Data Analysis and Findings

All respondents of this study were females, but 170 were bachelor's degree students, and 77 were master`s students. They were registered in the business incubators to work on their business ideas. 81 respondents were in the age group of 18-20 years, 95 were in the age group of 20-25 years, and 71 were in the age group of 25-30 years. The statistical tool JASP 0.17.3.0 – the latest version was applied for data analysis. The normality of research data was tested in the first stage. The findings were checked to identify the missing values in the data. However, the results show no missing value in the research data. Furthermore, the findings of skewness and kurtosis were determined to check the normality of the distribution. It is highly recommended that the findings of skewness and kurtosis should be between -2 and +2 for significant results of normality of distribution (Royston, 1992). The findings confirmed that normality of distribution was achieved

as skewness and kurtosis were reached significantly. The findings of descriptive statistics are reported in Table 2.

Table 2: Descriptive Statistics

Variables	Missing	Mean	Std. Deviation	Skewness	Kurtosis
STP	0	3.383	1.624	0.490	-1.159
MSO	0	3.552	1.724	0.426	-1.064
CS	0	3.533	1.682	0.468	-1.137
EI	0	3.03	1.337	1.133	0.493
EC	0	2.983	1.263	0.900	-0.343
ECC	0	2.996	1.319	0.936	0.086

STP = Science & Technology Park, MSO = Market Segregation Opportunities, CS = Commercialization Support, EI = Entrepreneurial Intention, EC = Entrepreneurial Career, and ECC = Economic Climate

Source: Authors' calculation

Secondly, the findings of Cronbach alpha (α) are used to confirm the validity of the empirical model. The findings of α above 0.70 are considered appropriate for the reliability of the model and data. The findings of α for science and technology park were 0.88, for market segregation opportunities were 0.91, for commercialization support were 0.77, for entrepreneurial intention were 0.89, for an entrepreneurial career were 0.90, and for economic climate were 0.86. Hence, the reliability of the model is confirmed. Furthermore, Pearson's correlation coefficient is the test statistic that measures the statistical relationship, or association, between two continuous variables. The Pearson correlation measures the strength of the linear relationship between two variables. It has a value between -1 and 1, with a value of -1 meaning a total negative linear correlation, 0 being no correlation, and + 1 representing a total positive correlation (Cohen et al., 2009). Furthermore, the upper and lower confidence intervals were also used to test the probability of population parameters. The confidence interval is helpful in determining the way our sample mean is related to the mean of the population. The findings of Pearson's correlations described in Table 3 confirmed correlations between research variables.

Table 3: Pearson's Correlations

Variable		STP	MSO	CS	EI	EC	ECC
1. STP	Pearson's r	—					
	p-value	—					
	Upper 95% CI	—					
	Lower 95% CI	—					
2. MSO	Pearson's r	0.930	—				
	p-value	< .001	—				
	Upper 95% CI	0.952	—				
	Lower 95% CI	0.900	—				
3. CS	Pearson's r	0.929	0.955	—			
	p-value	< .001	< .001	—			
	Upper 95% CI	0.951	0.969	—			
	Lower 95% CI	0.898	0.935	—			
4. EI	Pearson's r	0.638	0.572	0.549	—		
	p-value	< .001	< .001	< .001	—		
	Upper 95% CI	0.737	0.685	0.668	—		
	Lower 95% CI	0.513	0.432	0.405	—		
5. EC	Pearson's r	0.551	0.505	0.486	0.918	—	
	p-value	< .001	< .001	< .001	< .001	—	
	Upper 95% CI	0.669	0.632	0.617	0.943	—	
	Lower 95% CI	0.407	0.352	0.330	0.882	—	
6. ECC	Pearson's r	0.622	0.545	0.530	0.924	0.904	—
	p-value	< .001	< .001	< .001	< .001	< .001	—
	Upper 95% CI	0.724	0.664	0.652	0.948	0.933	—
	Lower 95% CI	0.492	0.399	0.382	0.892	0.863	—

STP = Science & Technology Park, MSO = Market Segregation Opportunities, CS = Commercialization Support, EI = Entrepreneurial Intention, EC = Entrepreneurial Career, and ECC = Economic Climate

Source: Authors' calculation

Regression analysis is a powerful statistical method that allows you to examine the relationship between two or more variables of interest. For regression analysis, $p < 0.05$ is considered an appropriate threshold (Draper & Smith, 1998). The regression analysis of the first hypothesis (H1) confirmed that the science & technology park is a significant predictor for female students' entrepreneurial intention ($t = 8.659$ & $p < 0.001$). The findings of the second hypothesis (H2) confirmed that market segregation opportunity is a significant predictor for female students' entrepreneurial intention ($t = 7.280$ & $p < 0.001$). Meanwhile, the findings of the third

hypothesis (H3) confirmed that commercialization support is a significant predictor for 'female students' entrepreneurial intention ($t = 6.866$ & $p < 0.001$). Accordingly, the findings of the fourth hypothesis (H4) confirmed that entrepreneurial intention is a significant predictor for female students' entrepreneurial careers ($t = 24.122$ & $p < 0.001$). Finally, the findings of the fifth hypothesis (H5) confirmed that economic climate significantly and negatively moderates the relationship between female students' entrepreneurial intention and their entrepreneurial careers ($t = 22.174$ & $p < 0.001$). The results of regression analysis are reported in Table 4.

Table 4: Regression Analysis

Model	Variables	Unstandar-dized	Standard Error	Standardized	T	p
H1	STP	0.526	0.061	0.638	8.659	< .001
H2	MSO	0.444	0.061	0.572	7.280	< .001
H3	CS	0.437	0.064	0.549	6.866	< .001
H4	EI	0.867	0.036	0.918	24.122	< .001
H5	EI*EC	0.116	0.005	0.905	22.174	< .001

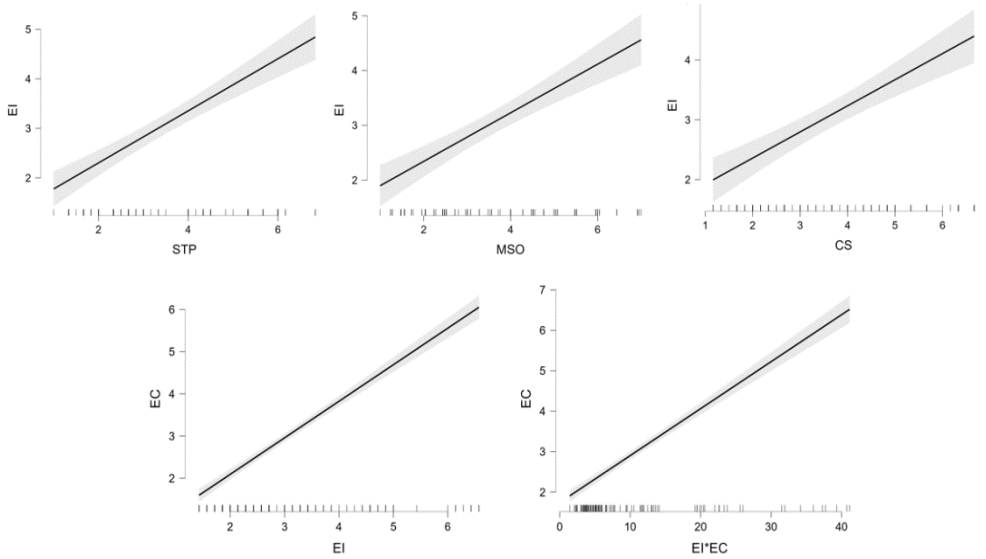
STP = Science & Technology Park, MSO = Market Segregation Opportunities, CS = Commercialization Support, EI = Entrepreneurial Intention, EC = Entrepreneurial Career, and ECC = Economic Climate

Source: Authors' calculation

The linear regression analysis was also used to determine the marginal effects of relationships, as reported in Figure 2. The marginal effect reports a change in the dependent variable based on a change in the independent variable, keeping other variables constant. The unstandardized coefficients are considered to interpret this effect. The shaded region around the line represents a 95% confidence interval. The unit of analysis for these effects was one. The marginal plot for the first relationship showed that a one-unit increase in science & technology park level is expected to increase female students' entrepreneurial intention by 0.526 units. Similarly, the plot for the second relationship showed that a one-unit increase in market segregation opportunity level is expected to increase female students' entrepreneurial intention by 0.444 units. The plot for the third relationship showed that a one-unit increase in commercialization support level is expected to increase female students' entrepreneurial intention by 0.437 units. Furthermore, the plot for the fourth relationship showed that a one-unit increase in female

students' entrepreneurial intention level is expected to increase their entrepreneurial career level by 0.867 units. Finally, the plot for the fifth relationship showed that a one-unit increase in moderation of economic climate affects the relationship between female students' entrepreneurial intention and careers by 0.116 units.

Figure 2: Marginal Effects Plots



STP = Science & Technology Park, MSO = Market Segregation Opportunities, CS = Commercialization Support, EI = Entrepreneurial Intention, EC = Entrepreneurial Career, and ECC = Economic Climate

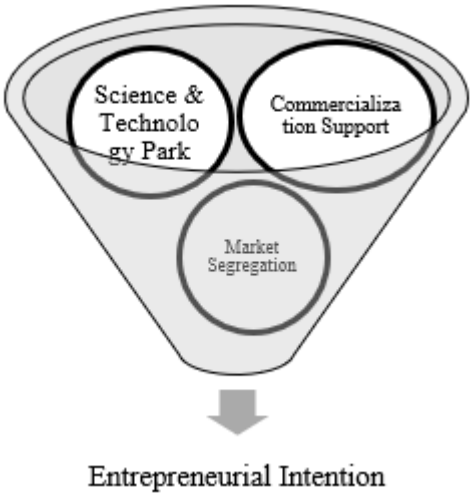
Source: Authors' calculation

Discussion and Conclusion

This study has empirical justification for its results. The relationships are accepted, and new contributions to the knowledge. The loops in the literature are closely related to women's entrepreneurial intentions and careers. The research has confirmed that science & technology parks, market segregation, and commercialization support are reliable for female students to improve their entrepreneurial intention for their entrepreneurship careers. The findings of H1, H2 and H3 significantly accept these results. The results of this research contrast with the findings of existing studies in the literature. The research by Cardella et al. (2020) highlighted that

women's entrepreneurship can be developed by entrepreneurial education. The studies reported that the entrepreneurial intention of women is improved with teaching support (Elnadi & Gheith, 2021), entrepreneurial courses (Hassan et al., 2020) and entrepreneurial self-efficacy (Xiaoping & Hua, 2019). Meanwhile, the research by Shil et al. (2020) in the context of Bangladesh reported that a university-based entrepreneurial ecosystem is a way forward to improve the entrepreneurial intention of the students. In accordance, the research by El Boury and Qafas (2022) conducted in the context of Morocco highlighted that an entrepreneurial ecosystem is required for the development of students' entrepreneurial intentions. In contrast to the findings of these studies, the researchers investigated that the science & technology park, market segregation and commercialization support are significant factors that influence the entrepreneurial intention of women. The outcomes are shown in the funnel depicted in Figure 3 as science & technology parks, market segregation, and commercialization support are necessary for entrepreneurial intention.

Figure 3: Funnel of Entrepreneurial Intention



Source: Authors

Furthermore, the researchers investigated that their entrepreneurial intention significantly predicts female entrepreneurial careers. The empirical findings of H4 support this result. This relationship is also in contrast with the findings of prior research. The existing studies report that the entrepreneurial career of women is possible with entrepreneurial learning,

entrepreneurial activities (Ge et al., 2022), and a self-independence approach (Al & Mostafa, 2019). Meanwhile, the studies in the literature also reported that women's entrepreneurial careers are supported by financial support from the microfinance sector (Abebe & Kegne, 2023) and family support (Welsh & Kaciak, 2019). However, the researchers investigated that the entrepreneurial intention of women is a significant predictor of their entrepreneurial career. Although this relationship was earlier tested in developed countries, the researchers have tested it for the first time in the developing country Pakistan.

The moderating analysis confirmed the economic climate is a significant moderator, influencing the relationship between women's entrepreneurial intentions and careers. The statistical findings of H5 supported this relationship. The researchers have introduced the moderating effect of the economic climate in the Pakistani context. The studies before this research haven't considered the moderating role of economic climate. The economic climate in this research reports the overall economic environment for business startups in Pakistan. Since the economy of Pakistan is struggling, the study found that women`s entrepreneurial intention and its connection with their behavior are influenced by it. Therefore, the inconsistency in the findings of existing studies is evaluated, and this research confirmed that the economic climate of Pakistan has a negative role in the entrepreneurial startups of women. The result of H5 is groundbreaking, and the study introduced economic climate as a negative moderator between female entrepreneurial intention and career.

In a nutshell, three strong predictors of female entrepreneurial intention are confirmed by this research. The study reported science & technology parks, market segregation and commercialization support as significant factors influencing women's entrepreneurial intention. Furthermore, this research also confirmed that women with entrepreneurial intentions based on science & technology parks, market segregation and commercialization support are inclined towards entrepreneurship careers. However, the study confirmed that Pakistan's economic climate is unsuitable for women to start their entrepreneurial careers. Therefore, it is necessary to improve Pakistan's overall financial condition to advance entrepreneurship careers. This research brings novelty through both its theoretical insights and practical implications.

Implications and Future Directions

The findings of this research lead it toward theoretical and practical importance. Theoretically, this study has confirmed new significant predictors for female' entrepreneurial intention. The study has introduced science & technology parks as a significant predictor for females' entrepreneurial intention. Secondly, it confirmed that market segregation is an antecedent for improving female' entrepreneurial intention. Thirdly, the research confirmed that the entrepreneurial intentions of females are significantly influenced by commercialization support. These relationships are new in females' entrepreneurial intentions, as the prior research only focused on entrepreneurial education, entrepreneurial self-efficacy, entrepreneurial networking, and teaching support for female entrepreneurial careers. The research further confirmed that the entrepreneurial intention of females developed by science & technology parks, market segregation and commercialization support led them towards entrepreneurship careers. This relationship is also new in knowledge. The research finally confirmed the negative moderating effect of the economic climate on the relationship between females' entrepreneurial intentions and careers. These moderation findings are new in the literature and contribute to the inconsistency between the relationship between entrepreneurial intention and careers.

The researchers provide practical findings based on the tested relationships of this research. It is recommended that the universities be required to work on developing a science & technology park with the help of the government. This development would help to bring innovation to the market through products and services. This will serve as a foundation for women to develop their entrepreneurial careers. Furthermore, market segregation is also required for women working in business incubators for their entrepreneurial ideas. It is necessary to target the appropriate market for the delivery of products and services. It is essential to provide products and services to the right market to succeed. Accordingly, it is recommended that the universities develop a mechanism for commercialization support for the women who registered their ideas in business incubators. The Commercialization support is appropriate to increase the number of clients for products and services. Therefore, the women working in business incubators will have clients for their products and services. Support for science & technology parks, market segregation and commercialization support are necessary to lead women toward entrepreneurial careers. No doubt, the study tested the negative role of economic climate in women's

entrepreneurship intention and career development. The government must provide better financial support to the women for their entrepreneurial startups.

Although the research introduced three new predictors for female entrepreneurial intention, it has some limitations to be addressed by scholars. The population of this research is considered only from the registry of business incubators of 12 universities in Pakistan. However, this is a limitation in the generalization of practical findings. Therefore, the researchers are recommended to collect data from other developing countries to determine the effect of science & technology parks, market segregation and commercialization support on female entrepreneurial intention. Secondly, the study has tested the entrepreneurial intention of the women only, and entrepreneurial self-efficacy is not discussed. Therefore, the scholars are motivated to test the entrepreneurial self-efficacy of women in future studies. Finally, the researchers tested the negative role of economic climate as a moderator. However, the inconsistency in the discussion of entrepreneurial intention and behavior should be tested from the perspective of any positive moderator. Hence, the scholars are recommended to test the positive moderating role of financial support by the microfinance sector on the relationship between female entrepreneurial intention and career.

References

[1] **Abebe, A., & Kegne, M.** (2023). The role of microfinance institutions on women's entrepreneurship development. *Journal of Innovation and Entrepreneurship*, *12*(1), 1-24.

[2] **Afshan, G., Shahid, S., & Tunio, M. N.** (2021). Learning experiences of women entrepreneurs amidst COVID-19. *International Journal of Gender and Entrepreneurship*, *13*(2), 162-186.

[3] **Ahmad, Z., Chao, L., Chao, W., Iqbal, W., Muhammad, S., & Ahmed, S.** (2022). Assessing the performance of sustainable entrepreneurship and environmental corporate social responsibility: revisited environmental nexus from business firms. *Environmental Science and Pollution Research*, *29*(15), 21426-21439. https://doi.org/10.1007/s11356-021-17163-5

[4] **Ahmed, E. R., Rahim, N. F. A., Alabdullah, T. T. Y., & Thottoli, M. M.** (2019). An examination of social media role in entrepreneurial intention among accounting students: a SEM study. *Journal of Modern Accounting and Auditing*, *15*(12), 577-589.

[5] **Al, R. A., & Mostafa, R.** (2019). Entrepreneurial motivation and firm performance in Lebanon. In *Go-to-Market Strategies for Women Entrepreneurs* (pp. 157-171). Emerald Publishing Limited.

[6] **Alameeri, K., Alshurideh, M., & Al Kurdi, B.** (2021). The effect of Covid-19 pandemic on business systems' innovation and entrepreneurship and how to cope with it: A theatrical view. In *The effect of coronavirus disease (COVID-19) on business intelligence* (pp. 275-288). Springer.

[7] **Ali, A., Kelley, D. J., & Levie, J.** (2020). Market-driven entrepreneurship and institutions. *Journal of Business Research*, *113*, 117-128.

[8] **Anwar, I., Ahmad, A., Saleem, I., & Yasin, N.** (2023). Role of entrepreneurship education, passion and motivation in augmenting Omani students' entrepreneurial intention: A stimulus-organism-response approach. *The International Journal of Management Education*, *21*(3), 100842.

[9] **Anwar, M., Clauss, T., & Issah, W. B.** (2022). Entrepreneurial orientation and new venture performance in emerging markets: the mediating role of opportunity recognition. *Review of Managerial Science*, *16*(3), 769-796.

[10] **Audretsch, D. B., & Belitski, M.** (2021). Three-ring entrepreneurial university: in search of a new business model. *Studies in Higher Education*, *46*(5), 977-987.

[11] **Barbero, J. L., Casillas, J. C., Wright, M., & Ramos Garcia, A.** (2014). Do different types of incubators produce different types of innovations? *The Journal of Technology Transfer*, *39*, 151-168.

[12] **Biancone, P., Calandra, D., Lanzalonga, F., & Sadraei, R.** (2022). Emerging markets and multiple sectors for entrepreneurship: a multidisciplinary and multi-stakeholder analysis. In *International entrepreneurship in emerging markets* (pp. 7-28). Routledge.

[13] **Boholm, Å., & Corvellec, H.** (2011). A relational theory of risk. *Journal of risk research*, *14*(2), 175-190.

[14] **Cardella, G. M., Hernández-Sánchez, B. R., & Sánchez-García, J. C.** (2020). Women entrepreneurship: A systematic review to outline the boundaries of scientific literature. *Frontiers in Psychology*, *11*, 1557.

[15] **Chen, H. S., Mitchell, R. K., Brigham, K. H., Howell, R., & Steinbauer, R.** (2018). Perceived psychological distance, construal processes, and abstractness of entrepreneurial action. *Journal of Business venturing*, *33*(3), 296-314. https://doi.org/https://doi.org/10.1016/j.jbusvent.2018.01.001

[16] **Churchill, B., & Craig, L.** (2019). Gender in the gig economy: Men and women using digital platforms to secure work in Australia. *Journal of Sociology*, *55*(4), 741-761.

[17] **Cohen, I., Huang, Y., Chen, J., Benesty, J., Benesty, J., Chen, J., . . . Cohen, I.** (2009). Pearson correlation coefficient. *Noise reduction in speech processing*, 1-4.

[18] **Daneshjoovash, S. K., Jafari, P., & Khamseh, A.** (2021). Effective commercialization of high-technology entrepreneurial ideas: a meta-synthetic exploration of the literature. *Journal of Small Business & Entrepreneurship*, *33*(6), 663-688.

[19] **Drakpa, D., Loday, S., & Yangchen, K.** (2022). Factors Affecting Entrepreneurial Intention of the Female Students of Business Colleges of Bhutan: Applying the Theory of Planned Behaviour. *Journal of Women's Entrepreneurship and Education*, (1-2), 170-186.

[20] **Draper, N. R., & Smith, H.** (1998). *Applied regression analysis* (Vol. 326). John Wiley & Sons.

[21] **Duval-Couetil, N., Ladisch, M., & Yi, S.** (2021). Addressing academic researcher priorities through science and technology entrepreneurship education. *The Journal of Technology Transfer*, *46*(2), 288-318.

[22] **El Boury, M., & Qafas, A.** (2022). Improving the entrepreneurial ecosystem through education: The influence of entrepreneurship education on students' entrepreneurial intention in Morocco–A quantitative survey. *Journal of the International Council for Small Business*, *3*(4), 303-313.

[23] **Elnadi, M., & Gheith, M. H.** (2021). Entrepreneurial ecosystem, entrepreneurial self-efficacy, and entrepreneurial intention in higher education: Evidence from Saudi Arabia. *The International Journal of Management Education*, *19*(1), 100458.

[24] **Fasi, M. A.** (2022). An Overview on patenting trends and technology commercialization practices in the university Technology Transfer Offices in USA and China. *World Patent Information*, *68*, 102097.

[25] **Galindo-Martín, M.-Á., Castaño-Martínez, M.-S., & Méndez-Picazo, M.-T.** (2021). Effects of the pandemic crisis on entrepreneurship and sustainable development. *Journal of Business Research*, *137*, 345-353.

[26] **García-Holgado, A., Díaz, A. C., & García-Peñalvo, F. J.** (2019). Engaging women into STEM in Latin America: W-STEM project. Proceedings of the Seventh International Conference on Technological Ecosystems for Enhancing Multiculturality,

[27] **Ge, T., Abbas, J., Ullah, R., Abbas, A., Sadiq, I., & Zhang, R.** (2022). Women's entrepreneurial contribution to family income: innovative technologies promote females' entrepreneurship amid COVID-19 crisis. *Frontiers in Psychology*, *13*, 828040.

[28] **Gu, W., Wang, J., Hua, X., & Liu, Z.** (2021). Entrepreneurship and high-quality economic development: Based on the triple bottom line of sustainable development. *International entrepreneurship and management journal*, *17*, 1-27.

[29] **Guerrero, M., Liñán, F., & Cáceres-Carrasco, F. R.** (2021). The influence of ecosystems on the entrepreneurship process: a comparison

across developed and developing economies. *Small Business Economics*, *57*(4), 1733-1759.

[30] **Guerrero, M., Urbano, D., Cunningham, J. A., & Gajón, E.** (2018). Determinants of Graduates' Start-Ups Creation across a Multi-Campus Entrepreneurial University: The Case of Monterrey Institute of Technology and Higher Education. *Journal of Small Business Management*, *56*(1), 150-178. https://doi.org/https://doi.org/10.1111/jsbm.12366

[31] **Gul, R., Zakir, S., Ali, I., Karim, H., & Hussain, R.** (2021). The impact of education on business opportunities for women entrepreneurs in public & private television advertisements in Pakistan. *Industrial Engineering & Management Systems*, *20*(2), 140-147.

[32] **Hameed, I., & Irfan, Z.** (2019). Entrepreneurship education: a review of challenges, characteristics and opportunities. *Entrepreneurship Education*, *2*(3), 135-148. https://doi.org/10.1007/s41959-019-00018-z

[33] **Hassan, A., Saleem, I., Anwar, I., & Hussain, S. A.** (2020). Entrepreneurial intention of Indian university students: the role of opportunity recognition and entrepreneurship education. *Education+ Training*, *62*(7/8), 843-861.

[34] **Hassan, N. A.** (2020). University business incubators as a tool for accelerating entrepreneurship: theoretical perspective. *Review of Economics and Political Science*(ahead-of-print).

[35] **Hatoum, H., Haddoud, M. Y., & Mordi, C.** (2023). The contextual embeddedness of female entrepreneurship: investigating the influence of macro and motherhood factors in Bahrain. *Journal of Small Business and Enterprise Development*.

[36] **Hayter, C. S., Fischer, B., & Rasmussen, E.** (2021). Becoming an academic entrepreneur: how scientists develop an entrepreneurial identity. *Small Business Economics*, 1-19.

[37] **Hsieh, Y.-J., & Wu, Y. J.** (2019). Entrepreneurship through the platform strategy in the digital era: Insights and research opportunities. *Computers in Human Behavior*, *95*, 315-323.

[38] **Kapoor, S.** (2019). Entrepreneurship for economic and social empowerment of women: A case study of a self help credit program in Nithari Village, Noida, India. *Australasian Accounting, Business and Finance Journal*, *13*(2), 123-142.

[39] **Kaya, H. D.** (2021). Do Business-Friendly States Attract Female Entrepreneurs?. *Journal of Women's Entrepreneurship and Education*, (3-4), 1-21.

[40] **Krejcie, R. V., & Morgan, D. W.** (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*(3), 607-610.

[41] **Leitner, K.-H., Bergner, S., & Rybnicek, R.** (2021). The role of heads of departments in the commercialization of university research. *Journal of Business Economics*, *91*, 353-378.

[42] **Lestari, E. D., Rizkalla, N., & Purnamaningsih, P.** (2022). The effect of perceived university support, entrepreneurial self-efficacy and proactive personality in promoting student entrepreneurial intention in Indonesia. *Journal of Management and Business Education*, *5*(2), 169-197.

[43] **Li, C., Murad, M., & Ashraf, S. F.** (2023). The Influence of Women's Green Entrepreneurial Intention on Green Entrepreneurial Behavior through University and Social Support. *Sustainability*, *15*(13), 10123.

[44] **Lieu, J., Sorman, A. H., Johnson, O. W., Virla, L. D., & Resurrección, B. P.** (2020). Three sides to every story: Gender perspectives in energy transition pathways in Canada, Kenya and Spain. *Energy Research & Social Science*, *68*, 101550.

[45] **Lim, K. P., Lye, C.-T., Yuen, Y. Y., & Teoh, W. M. Y.** (2019). Women directors and performance: evidence from Malaysia. *Equality, Diversity and inclusion: an international journal*, *38*(8), 841-856.

[46] **Liñán, F., & Chen, Y. W.** (2009). Development and cross–cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship Theory and Practice*, *33*(3), 593-617.

[47] **Liu, X., Lin, C., Zhao, G., & Zhao, D.** (2019). Research on the effects of entrepreneurial education and entrepreneurial self-efficacy on college students' entrepreneurial intention. *Frontiers in Psychology*, *10*, 869.

[48] **Lyken-Segosebe, D., Montshiwa, B., Kenewang, S., & Mogotsi, T.** (2020). Stimulating Academic Entrepreneurship through Technology Business Incubation: Lessons for the Incoming Sponsoring University. *International Journal of Higher Education*, *9*(5), 1-18.

[49] **Manjaly, N. B., Joseph, G., & KS, K. N.** (2022). Entrepreneurial Intention of Indian Women University Students: The Role of Entrepreneurial Self-Assessment and Entrepreneurial Passion. *Journal of Women's Entrepreneurship & Education*.

[50] **McAdam, M., & McAdam, R.** (2008). High tech start-ups in University Science Park incubators: The relationship between the start-up's lifecycle progression and use of the incubator's resources. *Technovation*, *28*(5), 277-290.

[51] **Méndez-Picazo, M.-T., Galindo-Martín, M.-A., & Castaño-Martínez, M.-S.** (2021). Effects of sociocultural and economic factors on social entrepreneurship and sustainable development. *Journal of Innovation & Knowledge*, *6*(2), 69-77.

[52] **Meoli, A., Fini, R., Sobrero, M., & Wiklund, J.** (2020). How entrepreneurial intentions influence entrepreneurial career choices: The

moderating influence of social context. *Journal of Business venturing*, *35*(3), 105982.

[53] **GEM.** (2019). *Global Entrepreneurship Monitor: Global Report 2018/2019*. G. E. Monitor. http://www.gemconsortium.org/report/50012

[54] **Nabi, G., & Liñán, F.** (2013). Considering business start-up in recession time: The role of risk perception and economic context in shaping the entrepreneurial intent. *International journal of entrepreneurial behavior & research*.

[55] **Nasir, M., Iqbal, R., & Akhtar, C. S.** (2019). Factors affecting growth of women entrepreneurs in Pakistan. *Pakistan Administrative Review*, *3*(1), 35-50.

[56] **Neneh, B. N.** (2022). Entrepreneurial passion and entrepreneurial intention: the role of social support and entrepreneurial self-efficacy. *Studies in Higher Education*, *47*(3), 587-603.

[57] **Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D., & Czeglédi, C.** (2019). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, *44*(2), 361-379.

[58] **Olanrewaju, A.-S. T., Hossain, M. A., Whiteside, N., & Mercieca, P.** (2020). Social media and entrepreneurship research: A literature review. *International Journal of Information Management*, *50*, 90-110.

[59] **Quinn, S., & Woodruff, C.** (2019). Experiments and entrepreneurship in developing countries. *Annual Review of Economics*, *11*, 225-248.

[60] **Rafiq, F., Hussain, S., & Abbas, Q.** (2020). Analyzing students' attitude towards e-learning: A case study in higher education in Pakistan. *Pakistan Social Sciences Review*, *4*(1), 367-380.

[61] **Rahman, M. M., Salamzadeh, A., & Tabash, M. I.** (2022). Antecedents of entrepreneurial intentions of female undergraduate students in Bangladesh: a covariance-based structural equation modeling approach. *Journal of Women's Entrepreneurship and Education*, (1-2), 137-153.

[62] **Ratten, V.** (2020). Coronavirus and international business: An entrepreneurial ecosystem perspective. *Thunderbird International Business Review*, *62*(5), 629-634.

[63] **GEI.** (2019). *Global Entrepreneurship Index_2019_Final-1*. G. E. Index. The GEDI Institute.

[64] **Roundy, P. T., & Fayard, D.** (2019). Dynamic capabilities and entrepreneurial ecosystems: The micro-foundations of regional entrepreneurship. *The Journal of Entrepreneurship*, *28*(1), 94-120.

[65] **Royston, P.** (1992). Which measures of skewness and kurtosis are best? *Statistics in Medicine*, *11*(3), 333-343.

[66] **Rudhumbu, N., Du Plessis, E., & Maphosa, C.** (2020). Challenges and opportunities for women entrepreneurs in Botswana: revisiting the role of entrepreneurship education. *Journal of International Education in Business*, *13*(2), 183-201.

[67] **Rukmana, A. Y., Meltareza, R., Harto, B., Komalasari, O., & Harnani, N.** (2023). Optimizing the Role of Business Incubators in Higher Education: A Review of Supporting Factors and Barriers. *West Science Business and Management*, *1*(03), 169-175.

[68] **Safdar, M., & Yasmin, M.** (2020). COVID-19: A threat to educated Muslim women's negotiated identity in Pakistan. *Gender, Work & Organization*, *27*(5), 683-694.

[69] **Salahuddin, A., Mahmood, Q. K., & Ahmad, A.** (2022). Breaking second glass ceiling: lived experiences of women entrepreneurs in Pakistan. *Quality & Quantity*, *56*(1), 61-72. https://doi.org/10.1007/s11135-021-01119-5

[70] **Salamzadeh, Y., Sangosanya, T. A., Salamzadeh, A., & Braga, V.** (2022). Entrepreneurial universities and social capital: The moderating role of entrepreneurial intention in the Malaysian context. *The International Journal of Management Education*, *20*(1), 100609.

[71] **Salvato, C., Sargiacomo, M., Amore, M. D., & Minichilli, A.** (2020). Natural disasters as a source of entrepreneurial opportunity: Family business resilience after an earthquake. *Strategic Entrepreneurship Journal*, *14*(4), 594-615.

[72] **Sansone, G., Ughetto, E., & Landoni, P.** (2021). Entrepreneurial intention: An analysis of the role of student-led entrepreneurial organizations. *Journal of International Entrepreneurship*, *19*(3), 399-433.

[73] **Shil, M., Shahriar, M. S., Sultana, S., Rahman, S.-N., & Zayed, N. M.** (2020). Introduction to university based entrepreneurship ecosystem (U-BEE): A model case study from Bangladesh. *International Journal of Entrepreneurship*, *24*(1), 1-9.

[74] **Solesvik, M., Iakovleva, T., & Trifilova, A.** (2019). Motivation of female entrepreneurs: a cross-national study. *Journal of Small Business and Enterprise Development*, *26*(5), 684-705.

[75] **Stoica, O., Roman, A., & Rusu, V. D.** (2020). The Nexus between Entrepreneurship and Economic Growth: A Comparative Analysis on Groups of Countries. *Sustainability*, *12*(3), 1186. https://www.mdpi.com/2071-1050/12/3/1186

[76] **Tajpour, M., & Hosseini, E.** (2021). Entrepreneurial intention and the performance of digital startups: The mediating role of social media. *Journal of Content, Community & Communication*, *13*(1), 2-15.

[77] **Tara, N., Arshed, N., Aziz, O., & Yamin, M.** (2020). Can Financial Assistance Mediate the Training and Human Capital Relationship for

Pakistani Women Micro Entrepreneurs? *International Journal of Economics and Financial Issues*, *10*(4), 80.

[78] **Tomy, S., & Pardede, E.** (2020). An entrepreneurial intention model focussing on higher education. *International journal of entrepreneurial behavior & research*, *26*(7), 1423-1447. https://doi.org/10.1108/IJEBR-06-2019-0370

[79] **Ukwueze, E. R.** (2022). Women and Entrepreneurship in Nigeria: What Role Does Social Inclusion Play? *Journal of International Women's Studies*, *23*(5), 41-62-41.

[80] **Waqas, M., & Awan, M. S.** (2019). Do cash transfers effect women empowerment? Evidence from Benazir Income Support Program of Pakistan. *Women's Studies*, *48*(7), 777-792.

[81] **Welsh, D. H., & Kaciak, E.** (2019). Family enrichment and women entrepreneurial success: The mediating effect of family interference. *International entrepreneurship and management journal*, *15*(4), 1045-1075.

[82] **Welsh, D. H., Kaciak, E., Mehtap, S., Pellegrini, M. M., Caputo, A., & Ahmed, S.** (2021). The door swings in and out: The impact of family support and country stability on success of women entrepreneurs in the Arab world. *International Small Business Journal*, *39*(7), 619-642.

[83] **Xiaoping, Q., & Hua, J.-H.** (2019). Effect of college students' entrepreneurial self-efficacy on entrepreneurial intention: career adaptability as a mediating variable. *International Journal of Educational Methodology*, *5*(3), 305-313.

[84] **Yi, G.** (2021). From green entrepreneurial intentions to green entrepreneurial behaviors: the role of university entrepreneurial support and external institutional support. *International entrepreneurship and management journal*, *17*(2), 963-979.

[85] **Youssef, A. B., Boubaker, S., Dedaj, B., & Carabregu-Vokshi, M.** (2021). Digitalization of the economy and entrepreneurship intention. *Technological Forecasting and Social Change*, *164*, 120043.

[86] **Yulianto, A., Feriady, M., & Nurkhin, A.** (2023). Learning Model of Female Entrepreneurship in Indonesia: Development of Learning Model Based on the Characteristics and Needs of Female Entrepreneurs. *Journal of Women's Entrepreneurship & Education*, (1/2), 32-50.

[87] **Zhang, G., Yue, X., Ye, Y., & Peng, M. Y.-P.** (2021). Understanding the Impact of the Psychological Cognitive Process on Student Learning Satisfaction: Combination of the Social Cognitive Career Theory and SOR Model [Original Research]. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.712323

Article history: Received: September 20th, 2023

Accepted: January 15th, 2024

DOI: 10.28934/jwee24.12.pp66-92
JEL: J16, L26, O31

ORIGINAL SCIENTIFIC PAPER

Determinants of Digital Technology Adoption Among Women Entrepreneurs

Nungky Viana Feranita [1]
Andrias Dwimahendrawan [2]
Asmuni [3]
Sekolah Tinggi Ilmu Administrasi Pembangunan Jember, Department of Public Administration, Kaliwates, Jember, East Java Province, Indonesia

A B S T R A C T

Women entrepreneurs are promoted to adopt digital technology as a means of enhancing business performance. Therefore, this research aims to investigate the impact of human, social, financial, physical, and intellectual capital on digital technology adoption among women entrepreneurs. A quantitative method is used with an associative type across various business sectors in East Java Province, Indonesia. Furthermore, the sample is selected by purposive sampling with a total of 268 individuals. Data collection is carried out through a questionnaire, while the analysis is performed using PLS-SEM. The results show that human, financial, physical, and intellectual capital have a positive and significant influence on the adoption of digital technology among women entrepreneurs. However, only social capital reports an insignificant influence. Among the examined variables, intellectual capital plays the most crucial role in adopting digital technology. This research provides theoretical and practical implications for women entrepreneurs and the government.

[1] Corresponding author, e-mail: nungky_viana@stiapembangunanjember.ac.id
[2] Email: andrias@stiapembangunanjember.ac.id
[3] E-mail: asmuni@stiapembangunanjember.ac.id

KEYWORDS: *human capital, social capital, financial capital, physical capital, intellectual capital, digital technology adoption, women entrepreneurs*

Introduction

The inclusion of women in business is subjected to a substantial transformation due to the effects of the COVID-19 pandemic. Furthermore, women are engaged in entrepreneurial pursuits across diverse companies and are particularly susceptible to the repercussions. A discernible distinction exists between women and men in terms of business ownership (Elam et al., 2022). The exit rate from the business world increased from 2.9% to 3.6% over a two-year pandemic period. In upper-middle-income countries, the pandemic's most significant impact exit from the business world showed a 74% increase from 2019 to 2021, compared to men at 34%.

According to a global survey in 2021 (Elam et al., 2022), women (47%) and men (48.1%) entrepreneurs reported that the pandemic presented new business opportunities. The opportunity arising from the pandemic globally is the rapid adoption of digital technology. The use of digital technology offsets the loss of income for small businesses and those led by women. The pandemic increased business digitalization by 3 to 4 years and has driven widespread digital technology adoption.

However, few participants are equally prepared for this transformation (Lashitew, 2023) and women entrepreneurs are not ready to face these changes. Specifically in Indonesia, data from the Central Bureau of Statistics (2023) shows that the percentage of women internet users is still lower than that of men, while access to information technology is the key to increasing women's empowerment in the digital entrepreneurship sector. The urgency is related to the need to find contributory capital sources for the efforts of women entrepreneurs to adopt digital technology. This research uses human, social, financial, physical, and intellectual capital in relation to the adoption of digital technology.

Human capital is crucial because resources are determinants in supporting the adoption, diffusion, and spread of technology (Skare & Blažević Burić, 2022). Selective technology adoption policies should be accompanied by human resource education policies that impact economic growth (Hammad & El Naggar, 2023). Social capital provides opportunities, specifically for new women entrepreneurs (Hammad & El Naggar, 2023). Online social capital is used for entrepreneurial capacity development,

accessing resources, as well as recognizing and exploiting entrepreneurial opportunities. Digital financial capital reflects the principles of entrepreneurial feminism (Orser et al., 2020). Technology adoption can challenge or strengthen women entrepreneurs' access to financial capital in the digital era. A common factor limiting women`s interest is financial capital, which impacts their ability to become entrepreneurs (Kovaleva et al., 2023). Physical capital, such as infrastructure networks, can promote or hinder the adoption of digital technology (Awinia, 2023). Economic liberalization, increased private sector participation, and urbanization led to Industrial Revolution 4.0. However, the lack of infrastructure networks presents a challenge to technology adoption (Ullah et al., 2022). Intellectual capital is crucial for the sustainability of this variable (Ullah et al., 2022). The capital will drive the transformation, sustainability, and achievements of women in consistently growing businesses, serving as a measure of competitiveness in the economy.

This research aims to identify the influence of human, social, financial, physical, and intellectual capital on the adoption of digital technology. Therefore, 5 research questions are posed as follows: RQ1: Does human capital influence the adoption of digital technology among women entrepreneurs? RQ2: Does social capital influence the adoption of digital technology among women entrepreneurs? RQ3: Does financial capital influence the adoption of digital technology among women entrepreneurs? RQ4: Does physical capital influence the adoption of digital technology among women entrepreneurs? RQ5: Does intellectual capital influence the adoption of digital technology among women entrepreneurs? Based on these questions, this research focuses on determinants of the adoption of digital technology in East Java Province, Indonesia.

Literature Review

Digital Technology Adoption

The disruptive nature of digital technology has a systemic impact on enhancing organizational transformation, particularly in entrepreneurship (Santos et al., 2023). A total of three factors need to be understood in the adoption of digital technology, including demand conditions, supply conditions, and managerial attributes (Lashitew, 2023). Demand conditions refer to factors influencing the attractiveness of various digital technologies

resulting from information capabilities and human resources. Supply conditions are related to the availability of Information and Communication Technology (ICT) as well as digital solutions, such as basic infrastructure and internet-based services. Managerial attributes are characteristics of top managers in determining technology adoption decisions. In the entrepreneurial context, these attributes, such as gender influence, attitudes, risks, and adaptability in determining technology adoption (Orser et al., 2019).

Furthermore, technological adoption is related to the entrepreneurship intentions of women entrepreneurs. Various types of access, such as mental, material, skills, and usage, contribute significantly to the adoption of digital technology among rural women in India (Chatterjee et al., 2020). In Saudi Arabia, the use of digital media and other ICT is an effort to pursue entrepreneurship opportunities (McAdam et al., 2019). Digital entrepreneurship is expected to facilitate the engagement even though adopted technology is on a small scale. An example is the adoption of mobile applications for the sustainability of business in Saudi Arabia (Abed, 2021). Awareness of digitalization is not enough to influence the performance of women entrepreneurs in Nigeria (Shamaki et al., 2022). However, women entrepreneurs need to adopt and adapt to new technology to create added value for customers.

Pergelova et al. (2019) operationalized digital technology through 3 measures, namely infrastructure, Management Information System (MIS), and the Internet. Digital infrastructure use is measured as a formative index, including website ownership, online ordering options, online payment options, and electronic signatures. MIS use is measured as a formative index, including customer relationship management, supply chain management, and company resource planning systems. Furthermore, internet use is measured as frequency for work purposes, referring to use and value.

Human Capital

Human capital is the most important factor in the adoption of digital technology. This variable has a positive and significant influence on technology adoption in sub-Saharan African countries (Danquah & Amankwah-Amoah, 2017). The improvement in the performance of SMEs in Romania is not only the result of digital technology adoption but also

requires the human capital to effectively use the technology for deriving benefits (Martin et al., 2013)

Technology adoption depends on the skills, quality, and quantity of the workforce. The relationship is conditional, relying on various aspects of human capital and the nature of the technology. Human capital formed through learning mechanisms is the most crucial determinant in adoption (Asif & Lahiri, 2021). The direction depends on the accumulation of skills and the quality of education (Schiopu, 2015). Technology adoption relies on the skills of the workforce and the capacity of companies to adjust employment opportunities with changes in the manufacturing and service sectors in the European Union (Conti & Sulis, 2016). Educated and skilled workers increase the adoption of new technology in SMEs in Greece (Giotopoulos et al., 2017). Entrepreneurs can leverage their knowledge and skills to adopt various types of technology in the UK`s industrial sector (Ganotakis et al., 2021).

Human capital is a resource related to individuals and depends on health, education, training, knowledge, and skills (Kabir et al., 2012). Aspects explored by Kungwansupaphan et al. (2016) include education, knowledge, experience, and skills. Giotopoulos et al. (2017) measured the variable in adopting ICT through scientific background, while Ganotakis et al. (2021) used education and experience. Women's inclusion in the job market depends on their digital knowledge and skills (Jevtić et al., 2023). Therefore, hypothesis 1 proposed in this research is as follows:

H1: Human capital influences the adoption of digital technology among women entrepreneurs.

Social Capital

Zeleke et al. (2023) argued that the intensity of digital technology adoption should consider social capital, such as good relationships and trust with others. The concept is an additional important factor that has a positive influence on technology adoption. Social networks, social norms, and association activities have a significant influence on the level of technology adoption (Lee, 2015). In Chile, social capital consisting of trust in institutions as well as formal and informal networks becomes crucial in explaining the decisions (Hunecke et al., 2017). The variable significantly and positively influences technological innovation in SMEs in Kurdistan to

reduce the potential setback in technology adoption (Lawa & E-Vahdati, 2022).

There are differing research results regarding the willingness to adopt technology, even when conducted in China. (Ren et al., 2022) stated that social capital consisting of norms, networks, and trust had a positive influence on technology adoption behavior in Shandong Province. According to Han et al. (2022), the variable consisting of social networks, participation, and trust has a significant positive influence on the adoption of new technology in the eastern and central regions of China. Social capital has a significant negative influence on the adoption of new technology in the western region of China but does not have an impact in the northeastern region of China.

Therefore, attention should be provided to enhancing this capital to increase willingness to adopt new technology. Olamide & Ogbechie (2021) investigated informal sector SMEs in Nigeria using social capital measures based on internal and external perspectives. Internal social capital includes close friends, family members, business partners, and employees, while the external variable includes customers, suppliers, competitors, and associations. Internal and external are determining factors for the success of women entrepreneurs in Serbia (Stanković et al., 2023). Therefore, hypothesis 2 in this research is proposed as follows:

H2: Social capital influences the adoption of digital technology among women entrepreneurs.

Financial Capital

Financial capital influences the adoption of digital technology, specifically in terms of financing (Lestari et al., 2022) and often becomes the most significant obstacle. SMEs in India are beginning to implement Industry 4.0 and related technologies (Internet of Things, Advanced Robotics, Big Data, and Cybersecurity). However, in the implementation, financial risk becomes the most significant barrier to Industry 4.0 adoption (Tamvada et al., 2022). SMEs in the European Union face a lack of funding to enhance technology adoption (Henriques & Viseu, 2022). Furthermore, advanced regions with higher specialization levels should be associated with a lack of fund usage to improve ICT in SMEs.

Financial capital available includes funds from savings and credits (Ahmed & Wahid, 2011). This depends on changes in income and savings

after rural women`s inclusion in small-scale entrepreneurial activities in Bangladesh (Kabir et al., 2012). In the manufacturing sector of SMEs in Malaysia, financial support from the government is important (Jayeola et al., 2022). In this context, loans from the government greatly assist the capital of women entrepreneurs. Affirmative action is needed to facilitate access to loans from bank and non-bank financial institutions (Hendratmi et al., 2022). However, there are differences between men and women in borrowing from financial institutions globally (Antonijević et al., 2022). Women's opportunities to borrow are limited, so they prefer to borrow from informal sources. Therefore, hypothesis 3 proposed in this research is as follows:

H3: Financial capital influences the adoption of digital technology among women entrepreneurs.

Physical Capital

The relative resource structure reflects the importance of physical capital required for each company to adopt technology. In China, companies with higher physical capital intensity tend to adopt technology through cloud computing outsourcing (Zheng et al., 2020). Meanwhile, those with higher knowledge capital intensity use private clouds.

The transition requires the availability of infrastructure in both hardware and soft skills. The pandemic has increased technology adoption among SMEs in Veneto, Italy (Roffia & Mola, 2022), necessitating planning for the physical resources of companies to enable effective digitalization of processes and practices. Companies in Tanzania face obstacles in implementing Industry 4.0 due to a lack of supporting infrastructure networks (Awinia, 2023). Therefore, hardware and soft skills need to be considered as crucial factors in the African industrial leap toward Industry 4.0.

Physical capital is needed in the form of basic infrastructure to support technology adoption (Ahmed & Wahid, 2011). Women entrepreneurs in Bangladesh measure the variable in terms of household ownership of durable assets such as houses, machines, markets, healthcare facilities, and road transportation facilities (Kabir et al., 2012). Listed companies in China measure physical capital, including factories, machines, and other assets with fixed, tangible, and durable features (Zheng et al., 2020). Based on these considerations, hypothesis 4 is proposed as follows:

H4: Physical capital influences the adoption of digital technology among women entrepreneurs.

Intellectual Capital

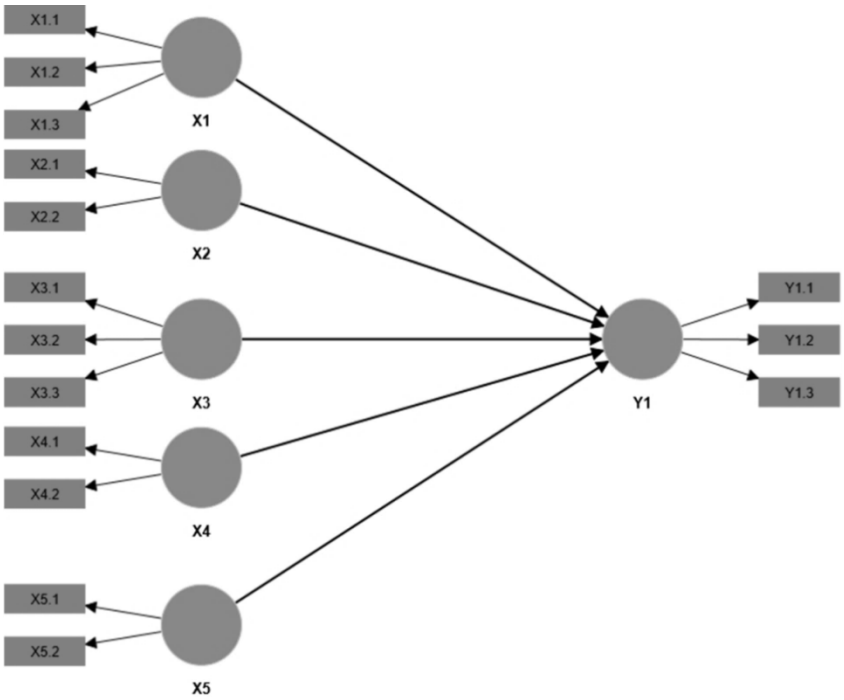
Intellectual capital signifies the intangible capabilities of companies, such as knowledge, information, and relationships used to create value (Khan et al., 2021). Anwar et al. (2021) interpreted the variable as how intellectual abilities and knowledge contribute to the creation of organizational value. There are 3 elements of intellectual capital, according to Do Rosário Cabrita and Bontis (2008), namely intangibility, value, and the growth effect of collective practices.

Intellectual capital enhances the recognition of opportunities to improve the growth and development of digital technology adoption. Abbas et al. (2022) examined the influence of the variable on the growth of technological innovation of SMEs in Pakistan. The results showed that human and customer capital significantly influenced technological innovation growth, while structural capital was found to be insignificant. The conceptualization influences technological innovation and sustainability-oriented initiatives in SMEs in Thailand (Phonthanukitithaworn et al., 2023). Intellectual capital increases the recognition of opportunities to develop open sustainability innovation. The variable refers to the collection of knowledge, information, intellectual property, and experience or knowledge possessed by the organization to enable value creation (Gómez-Valenzuela, 2022). Having a good reputation and non-physical assets such as intellectual property and certifications can assist in the adoption of technology (Hendratmi et al., 2022). Therefore, hypothesis 5 is formulated as follows:

H5: Intellectual capital influences the adoption of digital technology among women entrepreneurs.

Figure 1 shows the conceptual framework model in this research based on a literature review.

Figure 1: Conceptual framework model



Source: PLS-SEM, 2023

Method

This research used a quantitative approach with a causal associative type and was conducted across all regencies/cities in East Java Province from July to August 2023. The population was all women entrepreneurs registered with the Department of Cooperatives and SMEs in East Java Province. The sample was selected using purposive sampling, with the criteria being women entrepreneurs who have adopted digital technology in their marketing, and the number of respondents fulfilling the criteria was 268 individuals. Primary data sources were obtained from questionnaires distributed offline, while secondary data sources were sourced from the Department of Cooperatives and SMEs in East Java. The data collection technique comprised distributing questionnaires to women entrepreneurs. The research included human, social, financial, physical, and intellectual capital as exogenous variables as well as digital technology adoption as the

endogenous variable constructed from several dimensions and indicators, as shown in Table 1.

Table 1: Matrix of variables, dimensions, and indicators

Variable	Dimension	Indicator
Human capital (X1) (Kabir et al., 2012) (Kungwansupaphan et al., 2016) (Giotopoulos et al., 2017) (Ganotakis et al., 2021)	Education (X1.1)	1. Women entrepreneurs (X1.1.1) 2. Employees (X1.1.2)
	Expertise/skills (X1.2)	1. Women entrepreneurs (X1.2.1) 2. Employees (X1.2.2)
	Experience (X1.3)	1. Women entrepreneurs (X1.3.1) 2. Employees (X1.3.2)
Social capital (X2) (Olamide & Ogbechie, 2021)	Internal (X2.1)	1. Family members (X2.1.1) 2. Employees (X2.1.2) 3. Close friends (X2.1.3) 4. Business partners (X2.1.4)
	External (X2.2)	1. Customers (X2.2.1) 2. Suppliers (X2.2.2) 3. Competitors (X2.2.3) 4. Associations/communities (X2.2.4)
Financial capital (X3) (Ahmed & Wahid, 2011) (Kabir et al., 2012) (Hendratmi et al., 2022) (Jayeola et al., 2022)	Personal (X3.1)	1. Savings (X3.1.1) 2. Income/revenue (X3.1.2)
	Financial institutions (X3.2)	1. Bank (X3.2.1) 2. Non-bank (X3.2.2)
	Government (X3.3)	1. Cash assistance (X3.3.1) 2. Credit interest subsidy (X3.3.2)
Physical capital (X4) (Ahmed & Wahid, 2011) (Kabir et al., 2012) (Zheng et al., 2020)	Properties (X4.1)	1. Business location (X4.1.1) 2. Warehouse (X4.1.2)
	ICT Equipment (X4.2)	1. ICT Device (X4.2.1) 2. Internet connection (X4.2.2)
Intellectual capital (X5) (Hendratmi et al., 2022)	Reputation (X5.1)	1. Social media (X5.1.1) 2. Good reputation (X5.1.2)
	Non-physical assets (X5.2)	1. Intellectual property rights (X5.2.1) 2. Certifications (X5.2.2)

Variable	Dimension	Indicator
Digital technology adoption (Y1) (Pergelova et al., 2019)	Infrastructure use (Y1.1)	1. Marketing and sales of products (Y1.1.1) 2. Order and payment (Y1.1.2)
	MIS use (Y1.2)	1. Product information (Y1.2.1) 2. Raw material information (Y1.2.2)
	Internet use (Y1.3)	1. Digital tools (Y1.3.1) 2. Added value (Y1.3.2)

Source: processed by researchers, 2023

The validity test showed that all indicators were declared valid without significant correlation values (ρ value < 0.05). Furthermore, the reliability test showed that all dimensions were considered reliable with a Cronbach's alpha > 0.60. The data analysis technique used was Partial Least Squares-Structural Equation Modelling (PLS-SEM) with SmartPLS 4.0 software to determine the influence of human, social, financial, physical, and intellectual capital on digital technology adoption among women entrepreneurs.

Results

In this research, the descriptive analysis covers 2 aspects, namely, general respondent and variable description. The general respondent description is used to show the number and percentage based on business sector, marital status, age, education, length of business operation, and number of employees. The results show that the majority of respondents are in the culinary (food/beverage) sector (64.2%), married (85.8%), aged between 21-30 and 31-40 years (69%), Senior/Vocational High School graduates (46.3%), operating business for ≤ 3 years (49.6%), and having 1-4 employees (94.4%).

The variable description is used to show the average of each indicator. Table 2 shows that respondents' perception of the human capital variable falls into the good category, with an average score of 3.60. The indicators "women entrepreneurs' experience" (X1.3.1) and "employees' education" indicator (X1.1.2) have the highest and lowest scores at 4.13 and 3.18, respectively.

Table 2: Human capital variable description

Indicator	Respondents' answer score (%)					Average	Interpretation
	1	2	3	4	5		
X1.1.1	14.2	7.8	19.4	22.8	35.8	3.58	Good
X1.1.2	24.6	10.4	17.5	17.2	30.2	3.18	Fairly good
X1.2.1	6.0	5.6	13.4	26.9	48.1	4.06	Good
X1.2.2	23.9	7.8	17.2	19.4	31.7	3.27	Fairly good
X1.3.1	4.9	4.9	15.7	22.0	52.6	4.13	Good
X1.3.2	22.8	7.1	13.4	25.4	31.3	3.35	Fairly good
					Total	**3.60**	**Good**

Source: processed by researchers, 2023

Table 3 shows that respondents' perception of the social capital variable falls into the good category, with an average score of 3.76. The "support from family members" (X2.1.1) and "business associations/communities" (X2.2.4) have the highest and lowest scores at 4.68 and 3.30, respectively.

Table 3: Social capital variable description

Indicator	Respondents' answer score (%)					Average	Interpretation
	1	2	3	4	5		
X2.1.1	1.1	1.1	5.6	13.4	78.7	4.68	Excellent
X2.1.2	21.3	5.6	10.4	17.5	45.1	3.60	Good
X2.1.3	9.0	6.7	15.3	24.6	44.4	3.89	Good
X2.1.4	23.5	8.2	14.9	18.3	35.1	3.33	Fairly good
X2.2.1	0.7	3.7	10.4	21.3	63.8	4.44	Excellent
X2.2.2	16.0	9.0	23.1	23.9	28.0	3.39	Fairly good
X2.2.3	13.1	6.3	28.4	25.0	27.2	3.47	Good
X2.2.4	21.6	7.5	20.5	20.1	30.2	3.30	Fairly good
					Total	**3.76**	**Good**

Source: processed by researchers, 2023

Table 4 shows that respondents' perception of the financial capital variable falls into the good category, with an average score of 3.62. The "business income/revenue" (X3.1.2) and the "non-bank financial institutions" (X3.2.2) have the highest and lowest scores at 4.28 and 3.20, respectively.

Table 4: Financial capital variable description

Indicator	Respondents' answer score (%)					Average	Interpretation
	1	2	3	4	5		
X3.1.1	5.6	5.6	16.4	16.8	55.6	4.11	Good
X3.1.2	2.2	4.5	13.1	23.1	57.1	4.28	Excellent
X3.2.1	15.7	6.0	22.8	23.9	31.7	3.50	Good
X3.2.2	23.1	9.3	20.1	19.0	28.4	3.20	Fairly good
X3.3.1	22.4	6.0	19.4	17.5	34.7	3.36	Fairly good
X3.3.2	24.3	7.8	17.5	19.4	31.0	3.25	Fairly good
					Total	**3.62**	**Good**

Source: processed by researchers, 2023

Table 5 shows that respondents' perception of the physical capital variable falls into the good category, with an average score of 3.77. The "business location" (X4.1.1) and the "warehouse" (X4.1.2) have the highest and lowest scores at 4.38 and 2.97, respectively.

Table 5: Physical capital variable description

Indicator	Respondents' answer score (%)					Average	Interpretation
	1	2	3	4	5		
X4.1.1	1.9	4.1	11.2	19.8	63.1	4.38	Excellent
X4.1.2	26.9	10.8	21.3	20.5	20.5	2.97	Fairly good
X4.2.1	5.2	9.7	19.0	23.5	42.5	3.88	Good
X4.2.2	10.4	6.3	17.2	19.4	46.6	3.85	Good
					Total	**3.77**	**Good**

Source: processed by researchers, 2023

Table 6 shows that respondents' perception of the intellectual capital variable falls into the good category, with an average score of 3.80. The "good reputation" (X5.1.2) and "intellectual property rights" (X5.2.1) have the highest and lowest scores at 3.94 and 3.67, respectively.

Table 6: Intellectual capital variable description

Indicator	Respondents' answer score (%)					Average	Interpretation
	1	2	3	4	5		
X5.1.1	4.5	8.2	21.6	28.0	37.7	3.86	Good
X5.1.2	3.0	6.7	20.9	32.1	37.3	3.94	Good
X5.2.1	9.3	8.6	19.8	30.6	31.7	3.67	Good
X5.2.2	9.3	6.3	20.1	30.2	34.0	3.73	Good
					Total	**3.80**	**Good**

Source: processed by researchers, 2023

Table 7 shows that respondents' perception of digital technology adoption variable falls into the good category, with an average score of 3.85. The "marketing and sales of products" (Y1.1.1) and "raw material information" (Y1.2.2) have the highest and lowest scores at 4.21 and 3.15, respectively.

Table 7: Digital technology adoption variable description

Indicator	Respondents' answer score (%)					Average	Interpretation
	1	2	3	4	5		
Y1.1.1	4.5	6.7	10.4	19.8	58.6	4.21	Excellent
Y1.1.2	15.3	4.9	12.7	15.7	51.5	3.83	Good
Y1.2.1	9.7	10.1	14.2	20.1	45.9	3.82	Good
Y1.2.2	22.8	16.4	14.6	15.7	30.6	3.15	Fairly good
Y1.3.1	4.5	11.9	13.1	18.3	52.2	4.02	Good
Y1.3.2	4.5	10.4	12.3	21.3	51.5	4.05	Good
					Total	**3.85**	**Good**

Source: processed by researchers, 2023

PLS-SEM analysis is used to test hypotheses in this research. The evaluation of the outer (reflective measurement) and inner model (structural) is necessary to assess the PLS-SEM results (Hair Jr. et al., 2022).

Outer Model Evaluation

The first step in evaluating the outer model includes examining the indicator reliability test results through outer loadings. Table 8 shows that all outer loadings are > 0.708 to fulfill the standard. The second step is to

assess the internal consistency reliability. All variables have Cronbach's alpha > 0.70 and composite reliability > 0.80, showing satisfactory values (Table 8). Based on the results, the model has a high level of reliability. The third step is to examine the convergent validity test results through Average Variance Extracted (AVE). Table 8 shows that all variables have AVE ≥ 0.50, explaining more than half of the indicator variance.

Table 8: Outer loading, Cronbach's alpha, composite reliability, AVE, and VIF

Variable	Indicator	Outer loading	Cronbach's alpha	Composite reliability	AVE	VIF
Human capital (X1)	X1.1	0.872	0.890	0.931	0.819	2.269
	X1.2	0.918				2.868
	X1.3	0.924				2.910
Social capital (X2)	X2.1	0.877	0.710	0.874	0.775	1.436
	X2.2	0.884				1.436
Financial capital (X3)	X3.1	0.784	0.725	0.847	0.651	1.112
	X3.2	0.852				2.980
	X3.3	0.872				3.069
Physical capital (X4)	X4.1	0.819	0.713	0.869	0.769	1.442
	X4.2	0.931				1.442
Intellectual capital (X5)	X5.1	0.948	0.862	0.935	0.878	2.340
	X5.2	0.926				2.340
Digital technology adoption (Y1)	Y1.1	0.886	0.853	0.911	0.773	2.247
	Y1.2	0.863				1.898
	Y1.3	0.888				2.273

Source: processed by researchers, 2023

The last step is to assess the discriminant validity test results through cross-loading. According to Table 9, each indicator has the largest cross-loading, showing good discriminant validity.

Table 9: Cross-loading

Indicator	Variable					
	X1	X2	X3	X4	X5	Y1
X1.1	0.872	0.395	0.294	0.408	0.391	0.469
X1.2	0.918	0.439	0.343	0.450	0.415	0.557
X1.3	0.924	0.505	0.332	0.459	0.451	0.585
X2.1	0.450	0.877	0.252	0.363	0.316	0.415
X2.2	0.424	0.884	0.349	0.414	0.337	0.427
X3.1	0.370	0.327	0.784	0.440	0.475	0.565
X3.2	0.268	0.261	0.852	0.430	0.407	0.511
X3.3	0.211	0.225	0.872	0.429	0.391	0.506
X4.1	0.368	0.378	0.396	0.819	0.467	0.454
X4.2	0.472	0.401	0.537	0.931	0.606	0.712
X5.1	0.450	0.374	0.552	0.607	0.948	0.721
X5.2	0.418	0.317	0.439	0.554	0.926	0.608
Y1.1	0.500	0.389	0.589	0.622	0.623	0.886
Y1.2	0.548	0.433	0.577	0.589	0.650	0.863
Y1.3	0.526	0.439	0.579	0.607	0.608	0.888

Source: processed by researchers, 2023

Inner Model Evaluation

The initial step in evaluating the inner model includes assessing the structural model for collinearity through the Variance Inflation Factor (VIF). Table 8 shows that the VIF for all indicators is < 5, showing that the estimates of the structural model are not influenced by collinearity. The subsequent step is to assess the goodness of fit test results using Q^2. The results show a Q^2 of 0.663, meaning that the model has relevant predictive value and explains 66.3% of the information. The final step is to analyze the path coefficients and hypothesis test results.

Table 10: Path coefficients and hypothesis test results

Hypothesis		Path coefficients	T-statistics	P-values	Hypothesis test
H1	Human capital →Digital technology adoption	0.219	4.240	0.000	Accepted
H2	Social capital → Digital technology adoption	0.067	1.494	0.135	Rejected

Hypothesis		Path coefficients	T-statistics	P-values	Hypothesis test
H3	Financial capital → Digital technology adoption	0.284	5.877	0.000	Accepted
H4	Physical capital → Digital technology adoption	0.209	4.472	0.000	Accepted
H5	Intellectual capital → Digital technology adoption	0.306	5.860	0.000	Accepted

Source: processed by researchers, 2023

Table 10 shows that all variables in the model have positive path coefficients. Therefore, the human, social, financial, physical, and intellectual capital possessed by women entrepreneurs is directly proportional to the changes in digital technology adoption. The largest and smallest path coefficients are for the intellectual and social capital variables, respectively. The results show that 4 hypotheses have a significant influence, while 1 hypothesis has an insignificant influence. The human, financial, physical, and intellectual capital have an empirical t-value greater than the critical value (1.96) and a p-value smaller than 0.05, implying a statistically significant coefficient at the 5% level due to the acceptance of hypotheses 1, 3, 4, and 5. Meanwhile, social capital has an empirical t-value < 1.96 and a p-value > 0.05, showing that this coefficient is not statistically significant at the 5% level and hypothesis 2 is rejected.

Discussion

The Influence of Human Capital on the Adoption of Digital Technology

Hypothesis 1 (H1), stating that human capital influences digital technology adoption among women entrepreneurs, is accepted. The result shows that human capital has a positive and significant influence on adopting digital technology. This can be interpreted as an increase in human capital among women entrepreneurs, resulting in a larger adoption of digital technology. Human capital, consisting of education, expertise/skills, and experience indicators, significantly influences adoption. This confirms that

women entrepreneurs and employees have good education, expertise/skills, and experience in running business, specifically in the use of ICT.

From an empirical perspective, these results are consistent with Martin et al. (2013) and Danquah & Amankwah-Amoah (2017) examining the influence of human capital. The research by Martin et al. (2013) in Romania found that human resources are a key factor influencing the digitalization of companies. Danquah and Amankwah-Amoah (2017) reported that human capital positively and significantly influences technology adoption in sub-Saharan African countries. The indicators used to measure the variable in Martin et al. (2013) and Danquah and Amankwah-Amoah (2017) are different from those used in this research. The indicators used by previous results are education, while this research adds expertise/skills and experience indicators. Therefore, the result that human capital significantly and positively influences the adoption of digital technology is a novelty.

Based on the variable description, the indicator with the highest score is that women entrepreneurs have adequate experience in managing businesses. Despite the general respondent description showing that most women entrepreneurs have been running businesses for less than 3 years, experience enhances the ability to adopt digital technology.

The Influence of Social Capital on the Adoption of Digital Technology

Hypothesis 2 (H2), stating that social capital influences digital technology adoption among women entrepreneurs, is rejected. This variable does not have a significant influence on the adoption of digital technology. Therefore, social capital, consisting of internal and external dimensions, is not sufficient. Higher social capital should encourage women entrepreneurs to adopt digital technology, but this research does not support the notion.

From an empirical perspective, these results diverge from previous research examining the influence of social capital on digital technology adoption. Previous research showed that social capital had a positive and significant influence on technology adoption in Chile (Hunecke et al., 2017), China (Ren et al., 2022), and Kurdistan (Lawa & E-Vahdati, 2022). Specifically, there are differences in the use of indicators to measure the variable. Hunecke et al. (2017) and Ren et al. (2022) used social trust, networks, and norms, while Lawa and E-Vahdati (2022) adopted structure, relative, and cognitive. However, this research uses internal and external indicators, thereby providing different results in line with Han et al. (2022),

who argue that social capital does not have a significant influence on the adoption of new technology in the northeast region of China.

After closer examination, there are 3 statement items falling into the fairly good category, namely relationships with business partners/associates, suppliers, and business associations/communities. The indicator with the lowest score is business associations/communities, reflecting a limitation in sharing experience and knowledge with women entrepreneurs.

The Influence of Financial Capital on the Adoption of Digital Technology

Hypothesis 3 (H3), stating that financial capital influences digital technology adoption among women entrepreneurs, is accepted. This research shows that financial capital has a positive and significant influence on the adoption of digital technology. The greater the financial capital possessed by women entrepreneurs, the better the adoption of digital technology in business. This result provides evidence that financial capital from personal sources, institutions, and the government significantly influences the adoption of digital technology.

From an empirical perspective, previous results examining the influence of financial capital were conducted by Lestari et al. (2022) and Henriques and Viseu (2022). These results were consistent with research that financial capital significantly influenced technology adoption in SMEs in Indonesia (Lestari et al., 2022) and the European Union (Henriques & Viseu, 2022). However, there is a specific difference in the use of indicators to measure the financial capital variable. Lestari et al. (2022) used the quality and availability of financial resources, while Henriques and Viseu (2022) adopted total expenditure and total costs. There is a difference in the indicators of the financial capital variable used in this research. This further enriches the academic literature with a variety of indicators to measure the variable in women entrepreneurs.

Based on the variable description, the indicator with the highest score is the income/revenue of women entrepreneurs, which increases financial capital. Furthermore, capital is obtained for business from personal savings and financial institutions. These factors contribute significantly to women entrepreneurs adopting digital technology.

The Influence of Physical Capital on the Adoption of Digital Technology

Hypothesis 4 (H4), stating that physical capital influences digital technology adoption among women entrepreneurs, is accepted. This research shows that physical capital has a positive and significant influence on the adoption of digital technology. The physical capital possessed by women entrepreneurs is directly proportional to the adoption of digital technology. This suggests that property and ICT equipment dimensions variable significantly influences the adoption of digital technology.

From an empirical perspective, these results are consistent with previous research examining the influence of physical capital on digital technology adoption. Physical capital significantly influences the adoption of digital technology in China (Zheng et al., 2020), Italy (Roffia & Mola, 2022), and Tanzania (Awinia, 2023). Even though there is a similarity with some previous research, differences exist in the characteristics of business sectors. Most respondents were in the manufacturing and culinary (food/beverage) sector. Therefore, the result that physical capital significantly influences the adoption of digital technology is a novelty.

The indicator with the highest score, based on the variable description, is business location. Additionally, women entrepreneurs have good ICT equipment such as complete devices (computers, mobile phones/gadgets) and smooth internet connectivity, which is essential for running an online business. These supportive factors contribute to enhancing the adoption of digital technology among women entrepreneurs.

The Influence of Intellectual Capital on the Adoption of Digital Technology

Hypothesis 5 (H5), stating that intellectual capital influences the adoption of digital technology among women entrepreneurs, is accepted and this variable has a positive and significant influence. An increase in intellectual capital leads to a larger adoption of digital technology. This result provides evidence that the variable, consisting of reputation and non-physical assets indicators, significantly influences adoption.

From an empirical perspective, the results are consistent with previous research examining the influence of intellectual capital. Previous research showed that the variable had a significantly positive influence on technology adoption in SMEs in Pakistan (Abbas et al., 2022) and Thailand

(Phonthanukitithaworn et al., 2023), even though different indicators are used. Abbas et al. (2022) used human, structural, and consumer capital, while Phonthanukitithaworn et al. (2023) adopted relational, social, and structural capital. However, this research uses indicators of the intellectual capital variable adapted from a questionnaire developed by Hendratmi et al. (2022), namely reputation and non-physical assets. The difference enriches the variety of indicators to measure intellectual capital.

After closer examination of the data, the good reputation in the community receives the highest score compared to other indicators. Therefore, businesses owned by women entrepreneurs have a good reputation in the wider community, which is crucial to sustainability. Intellectual property rights receive the lowest score compared to other indicators. This implies that women entrepreneurs may not be fully aware of the importance of the rights (patents, copyrights, trademarks) in protecting business products.

Conclusion

In conclusion, this research was conducted to examine the influence of human, social, financial, physical, and intellectual capital on the adoption of digital technology among women entrepreneurs in East Java. Generally, out of the 5 hypotheses proposed in this research, 4 were accepted and 1 was rejected. The hypothesis test results showed that human, financial, physical, and intellectual capital had a significantly positive influence among women entrepreneurs, while social capital had a positive but non-significant influence. Furthermore, this research showed that intellectual capital had the highest path coefficient compared to others. This result supported previous results and reported the importance of cultivating various capital in adopting digital technology. This research had practical implications, where women entrepreneurs were expected to enhance human, financial, physical, and intellectual capital. Meanwhile, the government, as a policymaker, could support these entrepreneurs in several ways. Firstly, training programs should be provided to enhance the expertise/skills of women entrepreneurs and their employees in strengthening human capital. Secondly, easy access to financial capital, both in cash and non-cash, should be promoted. Thirdly, the government could provide ICT equipment assistance to enhance physical capital. Lastly, the process of managing intellectual property rights and certifications should be carried out to strengthen capital. These

programs were expected to assist women entrepreneurs in adopting digital technology.

Limitations and Further Research

This research includes diverse sectors, including culinary (food/beverage), fashion, beauty, crafts, and household needs. Further analysis is expected to focus on a more specific business sector for data homogeneity, such as the culinary (food/beverage) sector, which dominates women-owned businesses. This research is conducted in the local context of women entrepreneurs in East Java, limiting its generalizability nationally. A similar investigation should be performed on a national scale, covering all provinces to obtain more comprehensive results. Additionally, this research uses a quantitative approach and shows that social capital has an insignificant influence on adopting digital technology. Further analysis is promoted to use a qualitative approach to examine the occurrence of the phenomenon among women entrepreneurs.

Acknowledgements

The authors are grateful to the Ministry of Education, Culture, Research, and Technology of Indonesia for funding this research.

References

[1] **Abbas, M. G., Wang, Z., Ullah, H., Mohsin, M., Abbas, H., & Mahmood, M. R.** (2022). Do entrepreneurial orientation and intellectual capital influence SMEs' growth? Evidence from Pakistan. *Environmental Science and Pollution Research*, *29*(17), 25774–25789. https://doi.org/10.1007/s11356-021-17542-y

[2] **Abed, S. S.** (2021). Women entrepreneurs' adoption of mobile applications for business sustainability. *Sustainability*, *13*(21). https://doi.org/10.3390/su132111627

[3] **Ahmed, A. D., & Wahid, A. N. M.** (2011). Financial structure and economic growth link in African countries: A panel cointegration analysis. *Journal of Economic Studies*, *38*(3), 331–357. https://doi.org/10.1108/01443581111152436

[4] **Anwar, M., Clauss, T., & Ullah, R.** (2021). New Ventures Competitiveness and Success; Do Intellectual Capital, IT Capabilities, Entrepreneurial and

Market Orientation Really Matter? *Journal of Enterprising Culture*, *29*(04), 295–323. https://doi.org/10.1142/s0218495821500187

[5] **Antonijević, M., Ljumović, I., & Ivanović, D.** (2022). Is there a Gender Gap in Financial Inclusion Worldwide? *Journal of Women's Entrepreneurship and Education*, (1-2), 79-96. https://doi.org/10.28934/jwee22.12.pp79-96

[6] **Asif, Z., & Lahiri, R.** (2021). Dimensions of human capital and technological diffusion. *Empirical Economics*, *60*(2), 941–967. https://doi.org/10.1007/s00181-019-01777-3

[7] **Awinia, C. S.** (2023). Infrastructure Network Support and Leapfrogging Africa to Industry 4.0: The Case of Tanzania. *Procedia Computer Science*, *217*, 1–10. https://doi.org/10.1016/j.procs.2022.12.196

[8] **Central Bureau of Statistics.** (2023). *Mengakses Internet menurut Jenis Kelamin (Persen), 2020-2022*. Badan Pusat Statistik. https://bps.go.id/indicator/2/253/1/mengakses-internet-menurut-jenis-kelamin.html

[9] **Chatterjee, S., Dutta Gupta, S., & Upadhyay, P.** (2020). Technology adoption and entrepreneurial orientation for rural women: Evidence from India. *Technological Forecasting and Social Change*, *160*, 120236. https://doi.org/10.1016/j.techfore.2020.120236

[10] **Conti, M., & Sulis, G.** (2016). Human capital, employment protection and growth in Europe. *Journal of Comparative Economics*, *44*(2), 213–230. https://doi.org/10.1016/j.jce.2015.01.007

[11] **Danquah, M., & Amankwah-Amoah, J.** (2017). Assessing the relationships between human capital, innovation and technology adoption: Evidence from sub-Saharan Africa. *Technological Forecasting and Social Change*, *122*, 24–33. https://doi.org/10.1016/j.techfore.2017.04.021

[12] **Do Rosário Cabrita, M., & Bontis, N.** (2008). Intellectual capital and business performance in the Portuguese banking industry. *International Journal of Technology Management*, *43*(1–3), 212–237. https://doi.org/10.1504/IJTM.2008.019416

[13] **Elam, A. B., Baumer, B. S., & Schott, Thomas, Mahsa, Samsami, Amit Kumar Dwivedi, Rico J. Baldegger, Maribel Guerrero, Fatima Boutaleb, K. D. H.** (2022). *Global Entrepreneurship Monitor Releases New Research Highlighting Women'S Entrepreneurship Trends Across the Globe*. https://www.gemconsortium.org/reports/womens-entrepreneurship

[14] **Ganotakis, P., D'Angelo, A., & Konara, P.** (2021). From latent to emergent entrepreneurship: The role of human capital in entrepreneurial founding teams and the effect of external knowledge spillovers for technology adoption. *Technological Forecasting and Social Change*, *170*, 120912. https://doi.org/10.1016/j.techfore.2021.120912

[15] **Giotopoulos, I., Kontolaimou, A., Korra, E., & Tsakanikas, A.** (2017). What drives ICT adoption by SMEs? Evidence from a large-scale survey in Greece. *Journal of Business Research*, *81*, 60–69. https://doi.org/10.1016/j.jbusres.2017.08.007

[16] **Gómez-Valenzuela, V.** (2022). Intellectual capital factors at work in Dominican firms: understanding their influence. *Journal of Innovation and Entrepreneurship*, *11*(1), 1-24. https://doi.org/10.1186/s13731-022-00205-8

[17] **Hair Jr., J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M.** (2022). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). In *Angewandte Chemie International Edition, 6*(11)*, 951–952.* (Third Edit, Vol. 3, Issue 1). SAGE Publications, Inc.

[18] **Hammad, R., & El Naggar, R.** (2023). The Role of Digital Platforms in Women's Entrepreneurial Opportunity Process: Does Online Social Capital Matter? *Human Behavior and Emerging Technologies*, *5357335*, 1–15. https://doi.org/10.1155/2023/5357335

[19] **Han, M., Liu, R., Ma, H., Zhong, K., Wang, J., & Xu, Y.** (2022). The Impact of Social Capital on Farmers' Willingness to Adopt New Agricultural Technologies: Empirical Evidence from China. *Agriculture (Switzerland)*, *12*(9), 1–19. https://doi.org/10.3390/agriculture12091368

[20] **Hendratmi, A., Agustina, T. S., Sukmaningrum, P. S., & Widayanti, M. A.** (2022). Livelihood strategies of women entrepreneurs in Indonesia. *Heliyon*, *8*(9), e10520. https://doi.org/10.1016/j.heliyon.2022.e10520

[21] **Henriques, C., & Viseu, C.** (2022). How Efficient Is the Implementation of Structural Funds Committed to Enhancing ICT Adoption in SMEs? *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 147. https://doi.org/10.3390/joitmc8030147

[22] **Hunecke, C., Engler, A., Jara-Rojas, R., & Poortvliet, P. M.** (2017). Understanding the role of social capital in adoption decisions: An application to irrigation technology. *Agricultural Systems*, *153*, 221–231. https://doi.org/10.1016/j.agsy.2017.02.002

[23] **Jayeola, O., Sidek, S., Sanyal, S., Hasan, S. I., An, N. B., Mofoluwa Ajibade, S. S., & Phan, T. T. H.** (2022). Government financial support and financial performance of SMEs: A dual sequential mediator approach. *Heliyon*, *8*(11), e11351. https://doi.org/10.1016/j.heliyon.2022.e11351

[24] **Jevtić, B., Vucekovic, M., & Tasi, S**. (2023). The Effects of Digitalization and Skills on Women's Labor Market Inclusion- Serbian Gap Study. *Journal of Women's Entrepreneurship and Education*, 58-75. https://doi.org/10.28934/jwee23.pp58-75

[25] **Kabir, M. S., Hou, X., Akther, R., Wang, J., & Wang, L.** (2012). Impact of Small Entrepreneurship on Sustainable Livelihood Assets of Rural Poor Women in Bangladesh. *International Journal of Economics and Finance*, *4*(3), 265–280. https://doi.org/10.5539/ijef.v4n3p265

[26] **Khan, N. U., Anwar, M., Li, S., & Khattak, M. S.** (2021). Intellectual capital, financial resources, and green supply chain management as predictors of financial and environmental performance. *Environmental Science and Pollution Research*, *28*(16), 19755–19767. https://doi.org/10.1007/s11356-020-12243-4

[27] **Kovaleva, Y., Hyrynsalmi, S., Saltan, A., Happonen, A., & Kasurinen, J.** (2023). Becoming an entrepreneur: A study of factors with women from the tech sector. *Information and Software Technology*, *155*, 107110. https://doi.org/10.1016/j.infsof.2022.107110

[28] **Kungwansupaphan, C., Kumar, J., & Leihaothabam, S.** (2016). Gender in Management: An International Journal Capital factors and rural women entrepreneurship development: A perspective of Manipur state, India. *An International Journal Gender in Management An International Journal Management An International Journal*, *31*(30), 207–221. https://doi.org/10.1108/GM-04-2015-0031

[29] **Lashitew, A. A.** (2023). When businesses go digital: The role of CEO attributes in technology adoption and utilization during the COVID-19 pandemic. *Technological Forecasting and Social Change*, *189*, 122324. https://doi.org/10.1016/j.techfore.2023.122324

[30] **Lawa, K. O., & E-Vahdati, S.** (2022). The role of entrepreneurial orientation and social capital toward technology innovation among SMEs in Kurdistan. *Global Business Management Review (GBMR)*, *14*(2), 37–55. https://doi.org/10.32890/gbmr2022.14.2.3

[31] **Lee, B. C.** (2015). The impact of social capital on tourism technology adoption for destination marketing. *Current Issues in Tourism*, *18*(6), 561–578. https://doi.org/10.1080/13683500.2013.861392

[32] **Lestari, E. D., Hamid, N. A., Rizkalla, N., Purnamaningsih, P., & Urus, S. B. T.** (2022). The Effect of Financial Literacy, Cost of Technology Adoption, Technology Perceived Usefulness, and Government Support on MSMEs' Business Resilience. *GATR Global Journal of Business Social Sciences Review*, *10*(3), 132–147. https://doi.org/10.35609/gjbssr.2022.10.3(3)

[33] **Martin, F. M., Ciovica, L., & Cristescu, M. P.** (2013). Implication of Human Capital in the Development of SMEs through the ICT Adoption. *Procedia Economics and Finance*, *6*(13), 748–753. https://doi.org/10.1016/s2212-5671(13)00198-6

[34] **McAdam, M., Crowley, C., & Harrison, R. T.** (2019). "To boldly go where no [man] has gone before" - Institutional voids and the development of women's digital entrepreneurship. *Technological Forecasting and Social Change*, *146*, 912–922. https://doi.org/10.1016/j.techfore.2018.07.051

[35] **Olamide, A., & Ogbechie, R.** (2021). Social capital and business performance: a study of female-owned SMEs in the Nigerian informal

sector. *Small Enterprise Research*, *28*(2), 190–205. https://doi.org/10.1080/13215906.2021.1901140

[36] **Orser, B., Coleman, S., & Li, Y.** (2020). Progress or pinkwashing: who benefits from digital women-focused capital funds? *Small Business Economics*, *55*(2), 363–387. https://doi.org/10.1007/s11187-019-00302-1

[37] **Orser, B., Riding, A., & Li, Y.** (2019). Technology adoption and gender-inclusive entrepreneurship education and training. *International Journal of Gender and Entrepreneurship*, *11*(3), 273–298. https://doi.org/10.1108/IJGE-02-2019-0026

[38] **Pergelova, A., Manolova, T., Simeonova-Ganeva, R., & Yordanova, D.** (2019). Democratizing Entrepreneurship? Digital Technologies and the Internationalization of Female-Led SMEs. *Journal of Small Business Management*, *57*(1), 14–39. https://doi.org/10.1111/jsbm.12494

[39] **Phonthanukitithaworn, C., Srisathan, W. A., Ketkaew, C., & Naruetharadhol, P.** (2023). Sustainable Development towards Openness SME Innovation: Taking Advantage of Intellectual Capital, Sustainable Initiatives, and Open Innovation. *Sustainability*, *15*(3), 2126. https://doi.org/10.3390/su15032126

[40] **Ren, Z., Fu, Z., & Zhong, K.** (2022). The influence of social capital on farmers' green control technology adoption behavior. *Frontiers in Psychology*, *13*, 1–14. https://doi.org/10.3389/fpsyg.2022.1001442

[41] **Roffia, P., & Mola, L.** (2022). Is COVID-19 enough? Which underestimated conditions characterise the adoption of complex information infrastructures in small and medium-sized enterprises. *Journal of Business Research*, *144*, 1249–1255. https://doi.org/10.1016/j.jbusres.2021.12.083

[42] **Santos, S. C., Liguori, E. W., & Garvey, E.** (2023). How digitalization reinvented entrepreneurial resilience during COVID-19. *Technological Forecasting and Social Change*, *189*, 122398. https://doi.org/10.1016/j.techfore.2023.122398

[43] **Schiopu, I.** (2015). Technology adoption, human capital formation and income differences. *Journal of Macroeconomics*, *45*, 318–335. https://doi.org/10.1016/j.jmacro.2015.05.009

[44] **Shamaki, H., Ibrahim, U. A., & Philemon, N. A.** (2022). Evaluating the Influence of Digital Technology on the Performance of Female-Owned Enterprises in Nigeria. *Journal of Women's Entrepreneurship and Education*, (1-2), 39-60. https://doi.org/10.28934/jwee22.12.pp39-60

[45] **Skare, M., & Blažević Burić, S.** (2022). Technology adoption and human capital: exploring the gender and cross-country impact 1870–2010. *Technology Analysis & Strategic Management*, *34*(10), 1170-1186. https://doi.org/10.1080/09537325.2021.1948988

[46] **Stanković, S., Vujičić, S., & Radović-Marković, M.** (2023). Using Structural Equation Modeling in the Analysis of the Relationship Between

Internal and External Factors and Women Entrepreneurs' Success. *Journal of Women's Entrepreneurship and Education*, (1-2), 167-187. https://doi.org/10.28934/jwee23.12.pp167-187

[47] **Tamvada, J. P., Narula, S., Audretsch, D., Puppala, H., & Kumar, A.** (2022). Adopting new technology is a distant dream? The risks of implementing Industry 4.0 in emerging economy SMEs. *Technological Forecasting and Social Change*, *185*, 122088. https://doi.org/10.1016/j.techfore.2022.122088

[48] **Ullah, H., Wang, Z., Mohsin, M., Jiang, W., & Abbas, H.** (2022). Multidimensional perspective of green financial innovation between green intellectual capital on sustainable business: the case of Pakistan. *Environmental Science and Pollution Research*, *29*(4), 5552–5568. https://doi.org/10.1007/s11356-021-15919-7

[49] **Zeleke, B. D., Geleto, A. K., Asefa, S., & Komicha, H. H.** (2023). The role of social capital in addressing seed access constraints and adoption intensity: Evidence from Arsi Highland, Oromia Region, Ethiopia. *Heliyon*, *9*(2), e13553. https://doi.org/10.1016/j.heliyon.2023.e13553

[50] **Zheng, Q., Gu, D., Liang, C., & Fang, Y.** (2020). Impact of a firm's physical and knowledge capital intensities on its selection of a cloud computing deployment model. *Information and Management*, *57*(7), 103259. https://doi.org/10.1016/j.im.2019.103259

Article history: Received: November 23rd, 2023

Accepted: January 19th, 2024

DOI: 10.28934/jwee24.12.pp93-114
JEL: L26, L31, L33

ORIGINAL SCIENTIFIC PAPER

Catalysts for Change: Examining Prosocial Motivation's Role in Fostering Social Entrepreneurial Intentions Among Women in Matrilineal Cultures

Purbo Jadmiko [1]
Elfitra Azliyanti [2]
Linda Wati [3]
Universitas Bung Hatta, Faculty of Economics and Business, Department for Management, Padang, Indonesia
Muhammad Zakiy Ishak [4]
Universitas Muhammadiyah Yogyakarta, Faculty of Islamic Studies, Department for Muamalat Education, Yogyakarta, Indonesia

A B S T R A C T

Social entrepreneurship is important to attaining the Sustainable Development Goals (SDGs) worldwide. Currently, women have been heavily involved in social entrepreneurship activities. However, until now, a study involving women of Minang ethnicity (matrilinear lineage) on the student's interest in social entrepreneurship still needs to be completed. The objective of this paper is to look into the impact of prosocial and intrinsic motivation antecedents on women's social entrepreneurial intention. The inquiry model was tested in this study using a quantitative technique. This study involved 250 Minang students (female)who met the criteria that they had taken lectures for at least two semesters

[1] Corresponding author, e-mail: purbojadmiko@bunghatta.ac.id
[2] E-mail: elfitraazliyanti@bunghatta.ac.id
[3] E-mail: lindawati@bunghatta.ac.id
[4] E-mail: muhammadzakiy@fai.umy.ac.id

in Padang City. The moderating variables were investigated using the Moderated Regression Analysis (MRA) approach effect of intrinsic motivation (STATA). An interesting finding from this study is that prosocial motivation shows a positive and significant effect on social entrepreneurial intention. The urge to engage in social action triggers them to become social entrepreneurs. Although the results of the moderating effect are not proven, the implications of this investigation are very helpful for the government and higher education to develop a social entrepreneurship ecosystem and social entrepreneurship education. The originality of this paper lies in the fact that previous s*tudies haven't focused on the role of culture in shaping the social entrepreneurial intention* of *Minang students.*

KEYWORDS: *SDGs, planned behavior theory, social entrepreneurial intention, prosocial motivation, intrinsic motivation*

Introduction

One of the key roles in achieving the world's Sustainable Development Goals (SDGs) is the collaboration of various elements. Social entrepreneurship is an important element in promoting the achievement of the SDGs. Besides offering a way for entrepreneurs to change their lives, this also shows a way to empower others. There is a relationship between social enterprise and SDGs, "decent work for all" (Oliński & Mioduszewski, 2022). Social entrepreneurship can also reduce poverty in a country (Mohammed & Ndulue, 2017).

Despite the importance of social entrepreneurship, the entrepreneur population in Indonesia needs to be expanded. Indonesia's social entrepreneurs are only around 342,025 (British Council, 2018). Even according to the 2017 Global Entrepreneurship Monitor report, social entrepreneurs in Indonesia only reached 5%. Furthermore, in 2020, the British Council conducted a study involving 1,388 (2% of owners are women) social enterprises in Indonesia and found that the main sector is engaged in culinary, fashion, craft, edu and eco-tourism.

Based on the Global Entrepreneurship Monitor Report (2021), women in India, Indonesia and Kazakhstan have very strong cultural perceptions supporting entrepreneurship. However, female entrepreneurs cited job scarcity as a key motivation to create business. The issue of unemployment is inseparable from the issue of poverty. The concept of social entrepreneurship is growing rapidly in Indonesia. Several start-ups initiated by young millennials from various fields and scientific backgrounds started

to grow. The Indonesian government, through the Ministry of National Development Planning, stated that Indonesia's commitment to achieving the SDGs is not merely about fulfilling a global agreement but also about delivering on Indonesia's vision of increasing people's welfare through poverty reduction.

Social entrepreneurship is a transverse competency (García-González & Ramírez-Montoya, 2020). A concerted effort is needed to build a social entrepreneurship ecosystem to grow well. One of the parties that can contribute to this is universities. Therefore, universities should have a clear strategy to promote social entrepreneurship (García-González & Ramírez-Montoya, 2020).

Social entrepreneurship is an interesting topic of enquiry in overcoming various social problems. The main objectives of social entrepreneurship are to fulfill a mission and to provide social benefit. According to Hulgård (2010), entrepreneurship focusing on social good occurs when individuals and groups working to improve society work together to create new economic opportunities. Furthermore, inquiry suggests that women, particularly in social entrepreneurship, have distinct traits. Studies conducted by Rosca et al. (2020) in India and Colombia showed a correlation between women's social entrepreneurship and their tendency to be motivated by social issues, and the characteristics of feminism make women more empathetic. Several studies on social entrepreneurial intention have been extensively conducted (Jadmiko, 2019; Tiwati et al., 2017a, 2017b, 2020; Hockerts, 2017 Mohammed et al., 2017; Jadmiko, 2020b, 2020a, 2021). Social entrepreneurial intention among students is crucial since they are agents of change in society to overcome various social problems. In addition, the millennial generation is now living in the era of digitalization and automation that allows the creation of social missions and values through social business model innovation.

Furthermore, several studies of social entrepreneurship are also examined from the aspect of gender differences (Nicolás & Rubio, 2016), women's social entrepreneurship (Rosca et al., 2020), and culture (Canestrino et al., 2020). Few people recognize the importance of entrepreneurship across cultural domains despite the frequency of ethnic supremacy in an enterprise (Andri et al., 2020). However, there haven't been studies on the role of culture in the intention of social entrepreneurship in Minang students. The Minang people are very famous for being successful merchants in various countries. Minang people have a strong business

character from their ancestors (Andri et al., 2020). The characteristics of Minang entrepreneurs include self-confidence, hard work, careful/economical calculation, perseverance, independence, consistency, ingenuity, contribution to the family, flexibility, and courage to confront business challenges (Hastuti et al., 2015). Therefore, the Minang culture, closely tied to the entrepreneurial spirit, becomes intriguingly linked with social entrepreneurship.

This investigation examined the role of antecedents of prosocial and intrinsic motivation on women's intention toward social entrepreneurship. *Hence, we can investigate whether women, particularly those with stronger associations, exhibit higher levels of empathy. This is especially relevant in the context of Minang women and their social entrepreneurial intentions.*

Students from Minang's universities participated in the exploration, focusing on female students because, as stated by Rosca et al. (2020), females are better suited to serve as CEOs of nonprofit organizations. Therefore, the study's innovative outcome will understand Minang students' (particularly women's) contributions to inclusive economic development with an eye toward societal benefit. Two examination hypotheses were developed based on the empirical study:

H_1: Prosocial motivation has a positive effect on social entrepreneurial intention

H_2: The association between prosocial motivation and social entrepreneurial intention is moderated by intrinsic motivation. The higher the effect of prosocial motivation on social entrepreneurial intention, the higher the intrinsic motivation.

Literature Review

Social Entrepreneurship

Social entrepreneurs carry the theme of a sustainable economy. According to Portales (2019), there are three important elements in social enterprises. The first element is the main reason for social mission and solving social problems. The second element is the implementation in generating social innovation and scalability. Social innovation is seen in how to "produce" solutions to social problems. The last is the element of impact in the form of value created and sustainability. The sustainability

economy promises many benefits and creates equitable social welfare. According to Desa (2010), a word that describes social entrepreneurship is "an innovative way to solve social challenges". Otherwise, these social entrepreneurs are focused on attaining their objectives (Abu-saifan, 2012). Social entrepreneurship and business entrepreneurship are two distinct concepts. Based on Mair et al. (2006), while businesses are only concerned with profit and consumer happiness, social entrepreneurs are concerned with societal goals or values.

Collaboration can be made with other individuals and groups engaged in social innovation activities to generate benefits for the community (Hulgård, 2010). Social value is an important factor in generating social benefits for the environment. For example, civil society is a group of people working together to solve a problem by utilizing the social capital of the local community. Innovation is a social contribution that involves innovating to solve social problems.

The goal of the innovation in question isn't just to make money. Social issues drive innovation. Meanwhile, economic activity is the balancing act between social missions and commercial pursuits. Socially beneficial innovation is a viable and relevant business model. Social entrepreneurs carry the theme of a sustainable economy. According to Portales (2019) in his book, there are 4 (four) elements that determine the nature of social entrepreneurship. These elements include: (1) Social mission and social value creation as the main elements; (2) Motivation focuses on changes from structural conditions that result in solutions to the problems being addressed-visualized by entrepreneurs as opportunities for social transformation; (3) Models for social generation and economic value, (4) Success based on social impact than financial performance.

Based on the entrepreneurial elements described in Portales (2019), social value creation and mission constitute pivotal elements within the realm of social entrepreneurship, holding paramount significance. The social mission proclaimed in the concept of entrepreneurship can provide different contributions (new business models) that can answer various current social problems. The next element that is no less important is the element of motivation. Motivation is also based on the motivation to transform change, namely from the problem of creating solution ideas. Furthermore, the implemented social solutions lead to high economic value for a just economy. Finally, social entrepreneurship is also measured by financial performance and by considering aspects of social impact. Measuring the

social impact resulting from social business activities is one indicator of the success of a social entrepreneur.

Several elements put forward by Portales (2019) emphasize the importance of the individual aspect in motivating oneself to be part of the solution in society. The motivation that appears in a person does not necessarily appear by itself. However, it is more triggered by environmental factors. Meanwhile, the government and also elements of education should contribute to various social problems. Higher education needs to be involved in transferring the elements of social entrepreneurship to students through various direct learning activities (social projects).

Women's Entrepreneurship

Some literature suggests that men contribute to economic growth while women also play a crucial role in a country`s development. Women are acknowledged as proficient entrepreneurs, owning to their resolute ambition, intrinsic attributes, and adeptness in propelling substantial economic progress (Khan et al., 2021). Entrepreneurship education and social entrepreneurship are crucial in the socio-cultural context (cultural, family, and institutional support) as a tool to address the gender gap. Women`s entrepreneurship is also very important in the country's economic growth (especially in developing countries), promoting social inclusion and fighting poverty and discrimination (Cardella et al., 2020). An interesting fact was also found based on a study by Rosca et al. (2020): fact-finding was more important due to social causes closely related to those associated with male entrepreneurs who were more influenced by factors (such as finances). Therefore, studies on women's entrepreneurship can encourage access for any woman or man to become an entrepreneur.

Based on Radović-Marković and Achakpa (2018), women in developing countries have lower education and skill training levels. The dual role of a woman can also be a challenge in running a business. On the other hand, women generally tend to manage finances better. Women are more careful and patient in managing finances. Consequently, the intentions of start-up women may face more challenges, so they may adopt different strategies to find opportunities and place different interests on certain aspects of their operations (Manjaly et al., 2022).

Furthermore, not only being an ordinary entrepreneur, various studies confirm that women have an important role in social entrepreneurship and community empowerment. Women are more focused and actively involved

in solving problems rather than just profits (Ihejiamaizu & Inyang, 2022). The study confirms that intrinsic motivation is dominant in women's social intrapreneurial intention. On the other hand, women who work with social enterprises have stronger financial independence due to better self-confidence, autonomy, individual abilities, opinions on women's economic role, greater decision and control over households (Sharma & Kumar, 2021). Social entrepreneurship has been considered as a driver of women's empowerment; therefore, it is also important to assess its potential for women's empowerment.

Model of Social Entrepreneurship Intention

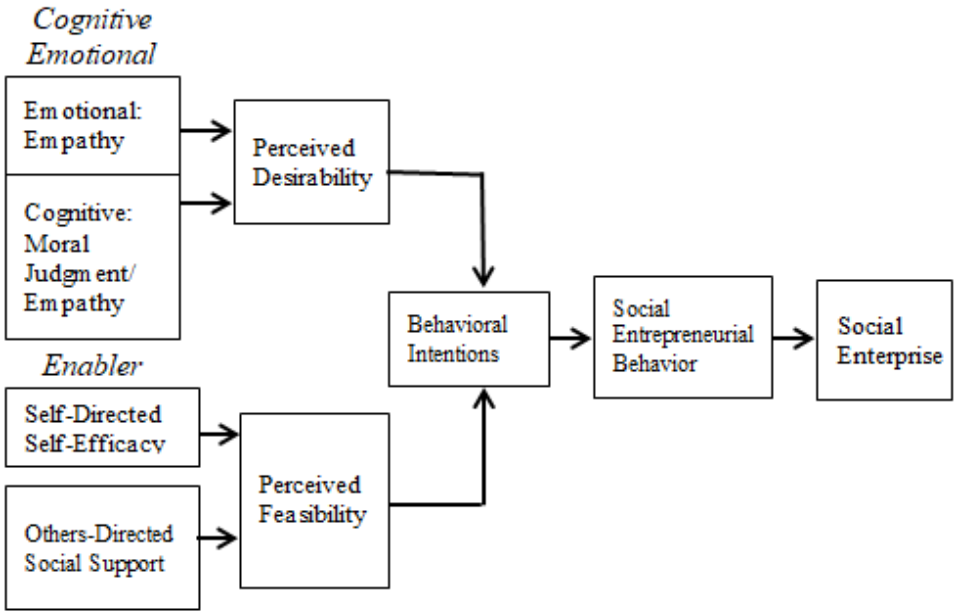
One of the theories as the basis related to social entrepreneurial intention is the Planned Behavior Theory. According to Ajzen's (1991) Planned Behavior Theory model, an individual's actions are preceded by a conscious decision to put their acquired knowledge into practice. The Planned Activity Theory (PAT) model is an attachment to the Theory of Reasoned Action (TRA), which states that one's intentions toward conduct are impacted by the attitude toward the behavior in question and perception of the social norms surrounding the behavior in question (Ajzen, 1975). As a result, figure 1 represents Mair and Naboa's (2006) initial try to develop a model that may represent the emergence of a model of social entrepreneurial intention. Additionally, the model found that the willingness to be involved in social entrepreneurship is impacted by the receipt of social assistance.

According to Tran and Von Korflesch (2016), individual cognitive elements (such as result expectations, goals/intentions, and self-efficacy) are emphasized in SCCT as important contributors to career growth. Here, intentions are seen as the will to act in a given way. Self-efficacy refers to "people's assessment of their ability to organize and carry out the actions necessary to achieve a designated type of performance" ("I know I can do it") (Bandura, 1986 in Tran and Von Korflesch, 2016). Also, result expectations are a person's impressions about the outcomes or effects of performing a certain behavior ("If I did it, what would happen"). As a result, a person's decision or purpose to act in a given domain is based on their assessment of their ability to plan and execute that action, as proposed by Social Cognitive Career Theory (self-efficacy), as well as the probability and anticipated outcomes of the action. Conduct specific actions (expectations of outcomes). Furthermore, Tran and Von Korflesch (2016) add that the theory also demonstrates the importance of individual and

contextual factors in career choice. As discussed above, Social Cognitive Career theory can explain the motivation behind someone's willingness to succeed as a social entrepreneur. This theory suggests that a person's career decisions are influenced by both individuals and their environmental context. Various social problems seen by someone can trigger someone to dedicate a career in the social field, including an interest in becoming a social entrepreneur.

Prosocial motivation is currently a hot topic of discussion (Pangriya, 2019). According to Tiwari et al. (2020) prosocial motivation plays a key role in the formation of intentions to become social entrepreneurs. In their study involving 755 respondents from India who recently established social enterprises, Tiwari et al. (2020) discovered that students' perceptions of prosocial motivation significantly influenced the development of intentions.

Figure 1: Intention Formation Model for Social Entrepreneurship



Source: Mair and Naboa (2006)

In addition, several studies have explored gender differences in social entrepreneurship (Nicolás & Rubio, 2016), women's involment in social entrepreneurship (Rosca et al., 2020), and the influence of culture

(Canestrino et al., 2020) on this phenomenon. However, no studies on the effect of culture on the evolution of social entrepreneurial purpose in Minang students have been conducted. Previous studies have found that women are more inclined to lead social enterprises than men. (Rosca et al., 2020). As a result, the novelty of the research lies in examining the role of Minang student social entrepreneurship in fostering inclusive economic development within society. Yamini et al. (2020) explained that an individual's motivation to become a social entrepreneur is influenced by prosocial and intrinsic motivation.

Tiwari et al. (2020) argued that prosocial motivations can influence one's decision to pursue social entrepreneurship. One of the prerequisites for assisting poor communities through the creation of social enterprises is prosocial motivation. Self-fulfillment is another essential factor in deciding to start a social venture (Solórzano-García et al., 2020). It has also been proven that women are more susceptible than men to a variety of motivational factors working in tandem. With strong prosocial motivation, social entrepreneurs develop solutions that can benefit society and the country as a whole (Tiwari et al., 2020).

Sample and Data Collection

The study model was put to the test quantitatively in this investigation. Nonprobability sampling was coupled with purposeful sampling in this investigation, with respondent characteristics of (1) female students (Minang ethnicity) and (2) students who had completed two semesters of lectures (n = 250). The independent variable in this study is prosocial motivation, while the moderating variable of intrinsic motivation. The study included social entrepreneurial intention as the independent variable and also examines its relationship with social entrepreneurial intention as the dependent variable. Google Forms was used to distribute the questionnaire.

Measurement

The variable consisting of intrinsic motivation instruments (4 items) adopted from Grant (2008) assesses "What motivates you in your current occupation (work/study), including the folowing statements: 1. Because I enjoy the work itself, 2. Because the work I do is important, 3. Because it's fun, 4. Because I find the work engaging". Prosocial motivation (4 items) adopted from Grant (2008) evaluates "What motivates you in your current

occupation (work/study): 1. Because I want to help others through my work, 2. Because I care about benefiting others through my work, 3. Because I want to have a positive impact on others, 4. Because it is important for me to do good for others through my work". Social entrepreneurial intention (3 items) adopted from Hockerts (2017) includes the following statements: 1. "I expect that at some point in the future I will be involved in launching an organization that aims to solve social problems", 2. "I have the germ of an idea for a social enterprise to pursue in the future and I have no intention of launching a social enterprise (the inverse)". The questionnaire utilizes 5-point Likert scale, with 1 representing strong disapproval, 2 moderate disapproval, 3 neutral disapproval, 4 agreement, and 5 strong agreement.

Data Analysis

The instrument`s validity was assessed using the Confirmatory Factor Analysis (CFA), while its reliabity was evaluated using Cronbach's Alpha analysis. Following the guidelines by Hair et al. (2010), the loading factor benchmarks are set at 0,30 (minimum level), 0.40 (intermediate), and 0.50 (highest level). Cronbach's alpha is another method for assessing consistency. The dependability is considered good, where Cronbach's alpha coefficient is 0.80.

Hypothesis testing is performed in STATA 21 utilizing a basic regression strategy and the Moderated Regression Analysis (MRA) technique. Furthermore, when the regression equation contains interaction variables, the moderating hypothesis can be tested with an interaction test strategy by employing the MRA technique. MRA is a regression to explain the role of an independent predictor variable, either as a pure moderator or a quasi-moderator by analyzing the relationship between two variables that are affected by moderators (Hair et al., 2010).

Results

This study involved 250 respondents (students of Minang ethnicity) from various public and private colleges in Padang City Indonesia. The process of collecting data for this examination was carried out from April 2021 to June 2021. The profile of respondents was, on average, 21 years old, with the largest proportion of experience starting a business due to lecture assignments (28.8%), interest/experience in social enterprises (71.2%), and the majority were from families who owned businesses

(52.4%). The total average achievement of respondents in the high group was shown in the description of each variable. Table 1 presents statistical information in greater depth.

Before evaluating the hypothesis, it is important to test the instrument. Instrument testing is used to discover instrument bias early in the measurement process. The feasibility assumption is checked using the KMO measure. A KMO score greater than 0.50 is considered adequate, indicating that further testing is viable. Based on Table 1, the KMO score for social entrepreneurial intention, prosocial motivation, and intrinsic motivation is 0.9187, based on 11 items, indicating a sufficiently large sample size.

After confirming the feasibility assumption and meeting the KMO criterion, the loading factor for each component item can be considered as the next stage in validity testing. Table 1 displays the overall findings of utilizing the CFA approach to determine instrument validity. According to the test findings, all 11 items including SEI1, SEI2, SEI3, PROS1, PROS2, PROS3, PROS4, MOTIV1, MOTIV2, MOTIV3, and MOTIV4 demonstrated satisfactory loading factors of 0.4).

Table 1: Items, Factor Loadings, and Cronbach's Alpha

Construct	**KMO = 0.0918 Loading Factor Value**				**Cronbach's Alpha**
	Instruments	**Factors**			
		1	**2**	**3**	
Social entrepreneurial intention	SEI1		0.489		0.754
	SEI2		0.814		
	SEI3		0.860		
Prosocial motivation	PROS1			0.868	0.912
	PROS2			0.882	
	PROS3			0.869	
	PROS4			0.800	
Intrinsic motivation	MOTIV1	0.865			0.922
	MOTIV2	0.869			
	MOTIV3	0.860			
	MOTIV4	0.883			

Source: Authors

After conducting a reliability test, Cronbach's Alpha was 0.6. (11 items are reliable). Additionally, all (11-item) measures demonstrated validity and consistency. As a result, the data was analyzed and the hypothesis was

tested through a simple regression methodology (for H_1) and the MRA technique (for H_2). Table 2 summarizes the overall findings of the hypothesis tests. A Sig. value of 0.000 at p 0.05 shows a positive relationship between prosocial motivation and the intent to engage in social entrepreneurship (H_1 is supported).

The regression coefficient result for hypothesis 1 was 0.428. Thus, in this model, prosocial motivation was able to influence 42.8% of students' social entrepreneurial intention (with *R - Squared* = 0,2664). Based on these findings, it can be stated that students' levels of perceived prosocial motivation have a favorable effect on the intention to be involved in social entrepreneurship. Students' intentions to be involved in social entrepreneurship are positively correlated to perceived prosocial drive.

Before setting the criteria for moderation, the MRA analysis was normally carried out through three regression stages. The prosocial motivation variable was tested on social entrepreneurial intention in the first stage. The second stage involved all independent variables (social entrepreneurial intention).

In the third phase, variables representing altruistic drive, social entrepreneurship, and the dynamic between the two were incorporated (Table 2). The tables show that intrinsic motivation is not proven to moderate (H_2 is rejected). The test on the second hypothesis was incorporated into the independent predictor criteria based on the requirements of Hair et al. (2010).

Traditionally, the MRA analysis progressed through three stages of regression before establishing the moderation form's criteria. To begin, the effect of prosocial motivation on social entrepreneurship aspirations was studied. In the second phase, we factored in every independent variable (including social entrepreneurial intention).

In the third phase, variables representing altruistic drive, social entrepreneurship, and the dynamic between the two were incorporated (details can be seen in Table 2). The results show that intrinsic motivation is not proven to moderate (H_2 is rejected). The test on the second hypothesis was incorporated into the independent predictor criteria based on the requirements of Hair et al. (2010).

Table 2: Technical Hypothesis Testing Results MRA

Social entrepreneurial intention	**Coef.**	**Std. Err**	**t**	**P>| t |**	**95% Conf.**
First step					
Prosocial motivation	0.428	0.0451	0.286	9.49	0.000***
R - Squared = 0,2664					
Second step					
Prosocial motivation	0.223	0.064	0.286	3.46	0.286
Intrinsic motivation	0.258	0.059	0.286	4.32	0.286
R - Squared = 0,318					
Third step					
Prosocial motivation	0.355	0.203	1.75	0.082	-0.045
Intrinsic motivation	0.425	0.250	1.70	0.091	-0.068
Prosocial motivation x Intrinsic motivation (interaction)	-0.009	0.013	-0.69	0.494	-0.035
R - Squared = 0.319					

*Description. n= 250, *** p < 0.01*

Source: Authors

Discussion

Although many studies on student social entrepreneurial intent have been conducted, these studies continue to generate ideas and discoveries about social entrepreneurship. The findings of this study can describe the role of women in social status in the context of Minang culture. The conclusions of this study have shown some intriguing findings that will be further studied. As a result, researchers investigate more in-depth social themes with social entrepreneurial intent. The findings confirm the hypothesis (H_1) that the desire to do good for others is correlated with a greater likelihood of engaging in social entrepreneurship. Consistent with Yamini et al. (2020a), these findings suggest that an individual's prosocial and intrinsic motivations have a role in whether or not they intend to become a social entrepreneur. This study empirically examines the role of prosocial motivation in social entrepreneurial intentions, along with psychological ownership and affective commitment. It provides insights into how prosocial motivation influences the intention to engage in social entrepreneurship.

The hypothesis testing has confirmed the findings of Tiwari et al. (2020), who found that prosocial motives promote the decision to engage in social entrepreneurship. Prosocial motivation is one of the basics for someone to help underprivileged communities through developing social enterprises. This study explores the relationship between social entrepreneurial intention and factors like perceived social support and prosocial motivation. It sheds light on the influence of prosocial motivations on individuals' inclination towards social entrepreneurship.

First, intrinsic motivation can be developed through various social activities that are supported by the learning process at the university. These results confirm that social entrepreneurial intention among students can be grown through intrinsic motivation. Intrinsic motivation itself is not created instantly; rather, there is a series of activities that shape it. It may be obtained from the process of social learning, involvement in humanitarian projects, or other social activities.

Second, the moderation test on the H_2 showed that intrinsic motivation did not affect the link between social entrepreneurial intention and prosocial motivation. Although the prosocial motivation study did not moderate the effect of intrinsic motivation on social entrepreneurial intention among students, this study is still expected to be one way to foster interest in social entrepreneurship. We need to underline that prosocial motivation and intrinsic motivation are much more essential for anyone who intends to be involved in social entrepreneurial activities (Yamini et al., 2020). The results of this study are consistent with the model formulated by Mair and Noboa (2006), which states that an important aspect of forming an interest in social entrepreneurship is the cognitive aspect of the individual. The higher the individual's cognitive perception, the stronger their drive to become a social entrepreneur.

This discussion explores two key points: Intrinsic motivation and its development through university-supported social activities and the moderating effect of intrinsic motivation on the relationship between social entrepreneurship intentions and motivation in society. This study shows that intrinsic motivation doesn't happen instantaneously. Instead, the organization thrives on social learning, humanitarian projects, and other related efforts. However, this study does not show that intrinsic motivation regulates the relationship between social entrepreneurship intention and social motivation. However, it emphasizes the importance of these two dynamics for those interested in social enterprise. Ultimately, this research

has practical implications for educational institutions. This suggests that universities can develop social entrepreneurship education policies by providing learning programs for social organizations or businesses and creating associations for incubator spaces. Create social entrepreneurship and launch start-up activities.

Furthermore, although intrinsic motivation is not proven to be moderating, this study can be a policy for colleges in developing social entrepreneurship education. Universities need to provide internship programs in social organizations/enterprises to provide students with opportunities to develop their own social enterprises. Aditionally, creating social business incubation spaces and offering coaching or tutorial classes led by successful social entrepreneurs can further support students in their entrepreneurial endeavors.

In summary, the passage discusses research findings on students' social entrepreneurship intentions, highlighting the importance of intrinsic motivation and prosocial behavior in promoting social entrepreneurship, particularly within a cultural context. The study's results resonate with the existing literature and provide valuable insights for academia and educational institutions.

Women's social entrepreneurial intention is influenced by the socio-cultural environment, social perceptions, and entrepreneurial orientation (Grisna et al., 2021). The cultural practices of power distance, humane orientation, in-group collectivism, future orientation, and uncertainty avoidance also play a role in shaping women's engagement in social entrepreneurship (Diana et al., 2020). Also, women's intention to engage in social entrepreneurship is influenced by cultural practices such as power distance, humane orientation, in-group collectivism, future orientation, and uncertainty avoidance.

In deprived areas, women's intention to set up social enterprises is motivated by their desire to create their own jobs and improve their surroundings, rather than changing the world (Amélie & Julie, 2017). Women's entrepreneurship is crucial for social upliftment and addressing gender-based issues, but the percentage of women involved in entrepreneurial activities is significantly lower than men (Reshma and Sripirabaa. 2019). Women entrepreneurs face various gender, social, and cultural barriers that affect their interest and ability to start and grow a business (Tongel, 2016). The socio-cultural experience of women influences their perception, preparation, principles, practice, and performance in

business. Furthermore, the findings of this study also strengthen the study conducted by Sharma and Kumar (2021) that social enterprises have great potential to create holistic women's empowerment (providing psychological support to increase independence). On the other hand, the development of women's entrepreneurship, especially in Indonesia, also requires a customized learning approach (Yulianto et al., 2023).

Conclusion and Recommendation

The findings of the study highlighted several important conclusions regarding the factors that shape social entrepreneurial intent. Specifically, various individual motivating variables were identified as influential factors in driving the inclination toward social entrepreneurship. Among these variables, prosocial motivation emerged as a significant driver, inspiring individuals to pursue involvement in social entrepreneurial endeavors. Consequently, a strong positive correlation was observed between the level of prosocial motivation and the intensity of the desire to engage in and ultimately become a social entrepreneur.

This study may also provide crucial recommendations to stakeholders, which are expected to be used in policy formulation by higher education administrators, notably in the areas of business and commerce (entrepreneurship). Learning outcomes that lead to social-sector entrepreneurship should now be incorporated into the design of curricula that include knowledge about entrepreneurship, particularly for Bung Hatta University in developing learning outcomes on growing social entrepreneurship for students. Environmental aspects of societal issues may provide pupils with information that will aid in their growth and development of creative ideas (experiential social learning). The concept is to involve the public in the construction of social learning.

Based on the research findings that highlight the important role of women in social entrepreneurship, several concrete recommendations can be put forward. First, there is a need to develop specific education and training programs that explicitly target women interested in engaging in social entrepreneurship. These programs should not only provide practical skills, but also empower women with in-depth knowledge of the social and environmental impacts of their entrepreneurial ventures.

In addition, supporting the establishment of strong support networks for women in social entrepreneurship can open doors of opportunity and expand

access to resources. Creating forums or platforms that allow women to share experiences, advice and support can strengthen communities and promote mutually beneficial collaborations.

Another recommendation is to create an environment that supports women's aspirations in social entrepreneurship. This could involve initiatives to raise awareness about the challenges and opportunities women face in this field, as well as creating policies and structures that remove barriers and provide tangible support. In this context, governments and higher education institutions can collaborate to design and implement policies that support women's social entrepreneurship. This includes changes in curriculum design to integrate aspects of social entrepreneurship, especially at Bung Hatta University, taking into account the needs and aspirations of women. Implementing these recommendations is hoped to create an environment that supports, empowers and enhances women's participation in social entrepreneurship, ensuring their greater contribution to achieving a positive impact on society.

The sample used only involved students, especially the Minang ethnic group in Padang City. This certainly has an impact on the generalization of exploration findings. As a result, it was unable to capture the overall state of social entrepreneurial purpose among undergraduate students, particularly in Indonesia. This research's depth of analysis is currently at the individual level. The question of gender variations between countries, diverse national cultural contexts, and personality characteristics has yet to be addressed in this study. Further study can develop other factors from Mair and Naboa`s (2006) model by involving practitioners as respondents, connecting Social Cognitive Career Theory (Aure et al., 2019), a new strand of Islamic social entrepreneurship (Ashraf, 2019), social entrepreneurship using technology (Ghatak et al., 2020), Islamic Social Entrepreneurship (Zaki et al., 2020), and other relevant issues to continue to develop social entrepreneurial models.

Acknowledgments

We thank the Lembaga Penelitian dan Pengabdian Masyarakat Universitas Bung Hatta for funding the basic examination through the Universitas Bung Hatta Internal Research Grant in 2021. We extend our deepest gratitude to the Directorate General of Higher Education, Research, and Technology, Ministry of Education, Culture, Research, and Technology,

for providing an invaluable training program on writing international scientific articles. Immense appreciation is also addressed to the entire editorial board of the Journal of Women's Entrepreneurship and Education, which provides opportunities for the publications of the study.

References

[1] **Abu-saifan**. (2012). Social Entrepreneurship: Definition and Boundaries. *Technology Innovation Management Review*, *2*(2), 22–27.

[2] **Ajzen, I.** (1975). Belief, attitude, intention and behaviour : An introduction to theory and research. In *Reading, MA: Addison-Wesley.* (Issue July). Reading, MA: Addison-Wesley.

[3] **Ajzen, I.** (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211.

[4] **Amélie, N., & Julie, T**. (2017). Girlz'n the hood: discovering the determinants of social entrepreneurial intention of women in deprived urban areas. *International Journal of Entrepreneurship and Small Business*. https://doi.org/10.1504/IJESB.2017.10001364

[5] **Andri, G., Adawiyah, W. R., Purnomo, R., & Sholikhah, Z**. (2020). The minang - Nomads businesses' performance: The role of proactive personality, creativity and innovative work behavior. *Jurnal Pengurusan*, *58*, 91–104. https://doi.org/10.17576/pengurusan-2020-58-08

[6] **Ashraf, M. A**. (2019). "Is Old Gold?" the Role of Prior Experience in Exploring the Determinants of Islamic Social Entrepreneurial Intentions: Evidence from Bangladesh. *Journal of Social Entrepreneurship*, *12*(2), 265–290. https://doi.org/10.1080/19420676.2019.1702580

[7] **Aure, P. A. H., Dui, R. P., Jimenez, S. V., Daradar, D. D., Gutierrez, A. N. A., Blasa, A. C., & Sy-Changco, J.** (2019). Understanding social entrepreneurial intention through social cognitive career theory: A partial least squares structural equation modelling approach. *Organizations and Markets in Emerging Economies*, *10*(1), 92–110. https://doi.org/10.15388/omee.2019.10.00005

[8] **British Council.** (2020). C*reative and Social Enterprise in Indonesia*. Retrived August 28, 2022, from https://www.britishcouncil.id/sites/default/files/dice_creative_and_social_enterprise_in_indonesia_report_en_final.pdf

[9] **Canestrino, R., Ćwiklicki, M., Magliocca, P., & Pawełek, B.** (2020). Understanding social entrepreneurship: A cultural perspective in business research. *Journal of Business Research*, *110*(July 2019), 132–143.

https://doi.org/10.1016/j.jbusres.2020.01.006

[10] **Cardella, G. M., Hernández-Sánchez, B. R., & Sánchez-García, J. C.** (2020). Women Entrepreneurship: A Systematic Review to Outline the Boundaries of Scientific Literature. *Frontiers in Psychology*, *11*(July), 1–18. https://doi.org/10.3389/fpsyg.2020.01557

[11] **Desa, G.** (2010). of a Research Field in Emergence. In *Values and Opportunities in Social Entrepreneurship* (pp. 6–28). Palgrave Macmillan, a division of Macmillan Publishers Limited.

[12] **Diana, M., Hechavarría., S, A., & Brieger.** (2020). Practice rather than preach: cultural practices and female social entrepreneurship. *Small Business Economics*. https://doi.org/10.1007/S11187-020-00437-6

[13] **García-González, A., & Ramírez-Montoya, M. S.** (2020). Social Entrepreneurship Competency in Higher Education: An Analysis Using Mixed Methods. *Journal of Social Entrepreneurship*, *14*(1), 91-109. https://doi.org/10.1080/19420676.2020.1823872

[14] **Ghatak, A., Chatterjee, S., & Bhowmick, B.** (2023). Intention towards digital social entrepreneurship: An integrated model. *Journal of Social Entrepreneurship*, *14*(2), 131-151. https://doi.org/10.1080/19420676.2020.1826563

[15] **Grisna, A., Veland, R., Anggraeni, P., Dini, T, & Alamanda, D.T.** (2021). Key determinants of women's entrepreneurial intentions in encouraging social empowerment. *Service Business*, *15*(2), 309-334. https://doi.org/10.1007/S11628-021-00444-X

[16] **Hair, F.** (2010). *Multivariate Data Analysis*. 7th ed. Upper Saddle River, NJ: Prentice Hall.

[17] **Hastuti, P. C., Thoyib, A., Troena, E. A., & Setiawan, M.** (2015). The Minang Entrepreneur Characteristic. *Procedia - Social and Behavioral Sciences*, *211*, 819–826. https://doi.org/10.1016/j.sbspro.2015.11.108

[18] **Hockerts, K.** (2015). The Social Entrepreneurial Antecedents Scale (SEAS): A Validation Study. *Social Enterprise Journal*, *11*(3), 260–280. https://doi.org/10.5465/AMBPP.2013.16805

[19] **Hockerts, K.** (2017). Determinants of social entrepreneurial intentions. *Entrepreneurship theory and practice*, *41*(1), 105-130. https://doi.org/10.1111/etap.12171

[20] **Hulgård, L.** (2010). Discourses of social entrepreneurship–Variations of the same theme. *EMES European Research Network*, *10*(1), 2-21.

[21] **Ihejiamaizu, G. C., & Inyang, J. J.** (2022). Women in Nigeria: Examining the Motivations for Engaging in Social Entrepreneurship. *Journal of Women's Entrepreneurship and Education*, *2022*(3–4), 126–148. https://doi.org/10.28934/jwee22.34.pp126-148

[22] **Jadmiko, P.** (2019). Peran Pemediasi Attitude Becoming Social Entrepreneur (ATB) Pada Pengaruh Antara Empati. *Jurnal Benefita: Ekonomi Pembangunan, Manajemen Bisnis and Akuntansi*, *4*, 422–434. https://doi.org/10.22216/jbe.v4i3.4617

[23] **Jadmiko, P.** (2020a). Linking perceived social support to social entrepreneurial intention: The mediating role of attitude becoming social entrepreneur. *Jurnal Menara Ekonomi: Penelitian dan Kajian Ilmiah Bidang Ekonomi*, *6*(2), 52–60. https://lens.org/069-380-243-063-526

[24] **Jadmiko, P.** (2020b). Minat Berwirausaha Sosial Dikalangan Mahasiswa. *Manajemen Bisnis*, *17*(2), 189–206. https://doi.org/10.38043/jmb.v17i3.2532

[25] **Jadmiko, P.** (2021). Perceived Social Support as Moderator Variable Between the Attitude of Becoming A Social Entrepreneur (ATB) on Social Entrepreneurial Intention. *Journal of Islamic Economic and Business Research*, *1*(1), 86–99. https://doi.org/10.18196/jiebr.v1i1.11703

[26] **Khan, R. U., Salamzadeh, Y., Shah, S. Z. A., & Hussain, M**. (2021). Factors affecting women entrepreneurs' success: a study of small- and medium-sized enterprises in emerging market of Pakistan. *Journal of Innovation and Entrepreneurship*, *10*(1). https://doi.org/10.1186/s13731-021-00145-9

[27] **Mair, J., Robinson, J., & Hockerts, K.** (2006). *Social Entrepreneurship*. New York: Palgrave Macmillan.

[28] **Manjaly, N. B., Nimmi, P. M., Joseph, G., & Kailash, N. K. S**. (2022). Entrepreneurial Intention of Indian Women University Students: The Role of Entrepreneurial Self-Assessment and Entrepreneurial Passion. *Journal of Women's Entrepreneurship and Education*, *2022*(3–4), 273–290. https://doi.org/10.28934/jwee22.34.pp273-290

[29] **Mohammed, B. S., Fethi, A., & Djaoued, O. B.** (2017). *The Influence of Attitude , Subjective Norms and Perceived Behavior Control on Entrepreneurial Intentions : Case of Algerian Students*, *7*(6), 274–282. https://doi.org/10.5923/j.economics.20170706.02

[30] **Mohammed, U. D., & Ndulue, I. T.** (2017). Impact of Social Entrepreneurship on Poverty Reduction in Nigeria: a Study of Wecyclers Social Entrepreneurship Ltd 1 2. *International Journal of Development Strategies in Humanities, Management and Social Sciences*, *7*(3), 63–73. http://internationalpolicybrief.org/journals/international-scientific-research-consortium-journals/intl-jrnl-of-development-strategies-in-humanities-vol7-no3-nov-2017

[31] **Nicolás, C., & Rubio, A.** (2016). Social enterprise: Gender gap and economic development. *European Journal of Management and Business Economics*, *25*(2), 56–62. https://doi.org/10.1016/j.redeen.2015.11.001

[32] **Oliński, M., & Mioduszewski, J.** (2022). Determinants of Development of Social Enterprises according to the Theory of Sustainable Development. *Sustainability (Switzerland)*, *14*(23). https://doi.org/10.3390/su142315679

[33] **Pangriya, R.** (2019). Hidden aspects of social entrepreneurs' life: a content analysis. *Journal of Global Entrepreneurship Research*, *9*(1). https://doi.org/10.1186/s40497-019-0199-6

[34] **Portales, L.** (2019). *Social Innovation and Social Entrepreneurship: Fundamentals, Concepts, and Tools*.

[35] **Radović-Marković, M., & Achakpa, P.** (2018). Employment Women Through Entrepreneurship Development and Education in Developing Countries. *Journal of Women's Entrepreneurship and Education*, *1–2*, 17. https://doi.org/10.28934/jwee18.12.pp17-30

[36] **Reshma., B., & Sripirabaa**. (2019). Entrepreneurial intention and self-efficacy among the women students. *Qualitative and Quantitative Research Review*, *3*(3), 19-44.

[37] **Rosca, E., Agarwal, N., & Brem, A.** (2020). Women entrepreneurs as agents of change: A comparative analysis of social entrepreneurship processes in emerging markets. *Technological Forecasting and Social Change*, *157*(April), 120067. https://doi.org/10.1016/j.techfore.2020.120067

[38] **Sharma, S., & Kumar, A.** (2021). Can Social Enterprises Create Holistic Women Empowerment? A Case of Indian Artisan Women. *Journal of Women's Entrepreneurship and Education*, *2021*(3–4), 96–112. https://doi.org/10.28934/jwee21.34.pp96-112

[39] **Solórzano-García, M., Navio-Marco, J., & Laguia, A**. (2020). The influence of intrinsic motivation and contextual factors on MOOC students' social entrepreneurial intentions. *Interactive Learning Environments*, *0*(0), 1–13. https://doi.org/10.1080/10494820.2020.1769680

[40] **Tiwari, P., Bhat, A. K., & Tikoria, J.** (2017a). Predictors of social entrepreneurial intention: an empirical study. *South Asian Journal of Business Studies*, *6*(1), 1–25. https://doi.org/10.1186/s40497-017-0067-1

[41] **Tiwari, P., Bhat, A. K., & Tikoria, J.** (2017b). *The role of emotional intelligence and self-efficacy on social entrepreneurial attitudes and social entrepreneurial intentions*. *0676* (September). https://doi.org/10.1080/19420676.2017.1371628

[42] **Tiwari, P., Bhat, A. K., & Tikoria, J.** (2020). Mediating Role of Prosocial Motivation in Predicting Social Entrepreneurial Intentions. *Journal of Social Entrepreneurship*, *13*(1), 118–141. https://doi.org/10.1080/19420676.2020.1755993

[43] **Tongel, M.** (2016). The socio-cultural aspects of the female entrepreneurship model. *Journal for International Business and*

Entrepreneurship Development, *9*(1), 102-117. https://doi.org/10.1504/JIBED.2016.074025

[44] **Tran, A. T. P., and Von Korflesch, H.** (2016). A conceptual model of social entrepreneurial intention based on the social cognitive career theory. *Asia Pacific Journal of Innovation and Entrepreneurship*, *10*(1), 17–38. https://doi.org/10.1108/apjie-12-2016-007

[45] **Yamini, R., Soloveva, D., & Peng, X.** (2020a). What Inspires Social Entrepreneurship? The Role of Prosocial Motivation, Intrinsic Motivation, and Gender in Forming Social Entrepreneurial Intention. In *Entrepreneurship Research Journal*, 12(2), 71-105. https://doi.org/10.1515/erj-2019-0129

[46] **Yulianto, A., Feriady, M., & Nurkhin, A.** (2023). Learning Model of Female Entrepreneurship in Indonesia: Development of Learning Model Based on the Characteristics and Needs of Female Entrepreneurs. *Journal of Women's Entrepreneurship and Education*, (1-2), 32-50.

[47] **Zaki, I., Widiastuti, T., Yudha, A. T. R. C., Wijayanti, I., & Mi'raj, D. A.** (2020). Implementation of Islamic entrepreneurial culture in Islamic boarding schools. *International Journal of Innovation, Creativity and Change*, *11*(11), 452–469.

Article history: Received: August 28th, 2023

Accepted: January 19th, 2024

DOI: 10.28934/jwee24.12.pp115-140
JEL: A22, C11, I23, L26, M13

ORIGINAL SCIENTIFIC PAPER

Investigating the Relationship between University Environment and Female Student's Entrepreneurial Thinking in Algeria: Institutional Theory Perspective

Atmane Saadaoui [1]
Armanurah Binti Mohamad [2]
Shamsul Huda Abd Rani [3]
Universiti Utara Malaysia, College of Business, School of Business Management, Sintok, Malaysia

A B S T R A C T

Female entrepreneurship is a growing segment which has the potential to promote economic growth and job creation in specific regions and countries. In particular, there is no consensus on the most effective way to foster female entrepreneurship. Universities are well-known actors where female students' entrepreneurial thinking can be developed. Moreover, the educational policies related to supporting students' entrepreneurial activities differ significantly among institutions and environments. Based on the lens of institutional theory, the aim of this study is to analyze the influences of the university environment on the development of entrepreneurial thinking among Algerian female university students. A self-administered survey was used in this study to gather data from 413 female students enrolled in three different Algerian universities. Using Smart-PLS software, the outcomes assert that the normative and cognitive dimensions significantly influence entrepreneurial thinking among female business students in

[1] Corresponding author, e-mail: at_saadaoui@yahoo.fr
[2] E-mail: armanurah@uum.edu.my
[3] E-mail: shuda@uum.edu.my

Algerian universities. Such a finding contradicts past research on the impact of the regulative dimension and brings fresh insights into the role of the support of Algerian higher education institutions in fostering the entrepreneurial thinking of their female business students.

KEYWORDS: *entrepreneurial thinking, female entrepreneurship, university environment, institutional theory, Algeria*

Introduction

In general, female entrepreneurship is often regarded as a core building block of economic improvement and job creation (Dhar et al., 2022; Rafiki & Nasution, 2019). In this regard, many studies have been conducted, considering that female entrepreneurship represents a growing segment with the potential to be an engine for employment and economic growth (Widiyanto et al., 2023). Literature around is mostly concerned with identifying and analyzing female entrepreneurship impediments (Soomro et al., 2022), whilst the drivers remain mostly unexplored (Sharafizad et al., 2022). Moreover, most existing studies mainly revolve around a gender comparison view, in which female entrepreneurs are examined solely in comparison to males (Ahsan, 2023; Yusuf et al., 2023). Indeed, Scholars (e.g., Rafiki & Nasution, 2019; Cabrera & Mauricio, 2017) asserted that female entrepreneurship as a separate research field is a suitable option. Thus, this represents an essential setting to investigate since female participation in influencing the future, innovation, and growth through entrepreneurship requires additional attention (Pergelova et al., 2023; Sharafizad et al., 2022).

Extant literature has attempted to explain and understand the factors that stimulate female students' entrepreneurial doing (Drakpa et al., 2022). However, the existing studies have primarily focused on studying women's entrepreneurial intention (Manjaly et al., 2022; Rahman et al., 2022; Messikh, 2021), neglecting to thoroughly investigate the antecedents of entrepreneurial thinking (ET hereafter). This oversight is unfortunate, as the essence of being entrepreneurial lies in ET (Krueger, 2007) and is often seen as an essential step in the entrepreneurial process, which everything else follows (Baron, 2006). Thus, ET can be a better measure when analyzing female student entrepreneurialism.

ET is a soft skill that helps female students spot and seize opportunities (Low et al., 2019), and it's positively associated with creative thinking

(Nasr et al., 2019). In view of its evident importance, the Algeria government invested deeply in universities, which are well-placed to provide students with settings that foster ET and behavior (Osmani & Beloucif, 2021). Despite these efforts, female students represent a minority in the entrepreneurial field and are not optimistic about starting their own business upon graduating. As the origin of entrepreneurship among women is scarce (Ali et al., 2022; Salamzadeh et al., 2023), it is important to build efficient mechanisms to support female entrepreneurship, especially in African countries like Algeria (Muindi & Masurel, 2022). And because Algeria has become a business hub with a lot of entrepreneurial opportunities, it is critical to examine the specific factors that enhance ET among female students (Kivalya & Caballero-Montes, 2023). Thus, understanding or forecasting how a female becomes an entrepreneur requires knowledge of the factors associated with the development of ET in females.

As a key element of the ecosystem, universities play an increasingly vital role in promoting entrepreneurship among their students (Saoula et al., 2023). Literature has also contended the crucial role of universities in catalyzing ET among female students (Chen et al., 2023). Therefore, universities are cornerstone actors in entrepreneurial ecosystems, and their environment has a direct role in raising female participation in business activities (Quagrainie, 2023). For example, the findings of Víquez-Paniagua et al. (2023) indicated that female undergraduates' entrepreneurial attitude is positively influenced by the university environment (UE hereafter). It is within the UE that students and future entrepreneurs can develop their entrepreneurial spirit (Moraes et al., 2021). In fact, this environment can boost students' entrepreneurial behavior (Víquez-Paniagua et al., 2023). Therefore, UE is one of the elements that this present study identifies as ET antecedents, owing to its relevance and the maneuverability of policymakers and educational institutions at many levels.

Institutional Theory (IT hereafter), on the other hand, has recently been a topic of interest for both entrepreneurship studies and scholars (Chiengkul et al., 2023). IT theorists (Scott, 1995) bifurcated institutions (universities) into three dimensions: "regulative, normative, and cognitive". In this conceptual conformity, Prior studies also showed that these three dimensions of institutions have an influence on entrepreneurial behavior (e.g., Valdez and Richardson 2013). Scott (2008) argued that UE might be primarily explained by the regulative, normative, and cognitive of

institutionalism. In accordance with IT, scholars such as Mustafa et al. (2023) showed that UE could be an alternative way to boost students' entrepreneurial activities. Despite this, investigations linking this theory with female ET are still uncharted, especially in Arab countries like Algeria (Aloulou, 2022). The present study seeks to respond to recent calls for more employee IT to further understand entrepreneurship (such as Xiao et al., 2022; He et al., 2020) as well as explore the influence of UE on female students ET (Pinheiro et al., 2023).

Toward this end, our work also attempts to offer a new perspective in the field in response to a recent call for more studies to examine the link between institutional dimensions and female students ET using Scott's (1995) paradigm (Sobhan & Hassan, 2023). To provide a more comprehensive perspective on female entrepreneurship, especially in African countries like Algeria (Kivalya & Caballero-Montes, 2023), and to fill previous gaps, this study empirically examines how the UE can help foster ET among young women in Algeria. Investigating ET from an institutional lens will indicate the extent to which each dimension of UE impacts the ET of female students in Algeria.

Literature Review and Hypotheses

Our work is motivated by the scarcity of literature on the influences of UE on ET using Institutional theory in Algerian higher education institutions, specifically among female students enrolled in Business courses. The review of the relevant literature on the Regulative Dimension (RD hereafter), Normative Dimension (ND hereafter), and Cognitive Dimension (CD hereafter) helps us present the theoretical framework and develop its hypotheses.

Entrepreneurial Thinking and Regulative Dimension

The RD gathers the laws, policies, and regulations that offer support for stimulating entrepreneurial doing (Aloulou, 2022). It has been widely demonstrated in the literature that the RD helps to reduce the fear of failure and enhance the capability to participate in entrepreneurship (Chen et al., 2023). Results of existing research (such as Urban and Kujinga, 2017) indicate a substantial correlation between RD and ET. Among these studies, Oftedal et al. (2018) explored the link between RD and ET, suggesting that it increases opportunity recognition among students. Furthermore, Zhuang

and Sun, (2023) have demonstrated how RDs may assist individuals in identifying and taking advantage of opportunities and thus influence ET. There is considerable evidence found in previous studies that show that RD positively (e.g., Ali et al., 2019), as well as negatively (Aljarodi et al., 2022;), influences female entrepreneurial activities. Furthermore, past studies have also argued that little is known about how university regulations and laws affect student entrepreneurship (Muscio et al., 2016).

Since most of the evidence offered by existing research was less collected in Algeria, therefore, our first hypothesis:

H1: RD positively influences ET among female business students at Algerian universities.

Entrepreneurial Thinking and Normative Dimension

According to Ghazali et al. (2021), the normative dimension frequently comprises both values and norms represented in desirable behaviors of individuals. From an entrepreneurial perspective, the ND helps boost entrepreneurial start-ups (Chiengkul et al., 2023). For instance, the findings of Chen et al. (2023) supported the argument that ND can promote female entrepreneurship and compensate for a lack of entrepreneurial cognition. Similarly, the findings of Hatoum et al. (2023) reveal the important influence of ND (under informal institutions) on the development of entrepreneurial activities among females. In the meantime, Li et al. (2021) emphasized the significance of ND in encouraging women's entrepreneurship. From these logics, studies such as Oftedal et al. (2018) further indicated that the ND of the UE could influence students' behavior. In a related study, Ogunsade et al. (2021) also demonstrated unequivocally that ND influences the ET of university students and the possibility of self-employment. Lahikainen et al. (2018) also provided new insights that normative influences had a greater impact on individuals' thinking and actions. More directly, Junaid et al. (2019) reveal that females in Malaysia are more inclined to be self-employed because entrepreneurship is an accepted career option. Since most of the evidence offered by existing research was less collected in Algeria, therefore, our second hypothesis:

H2: ND positively influences ET among female business students at Algerian universities.

Entrepreneurial Thinking and Cognitive Dimension

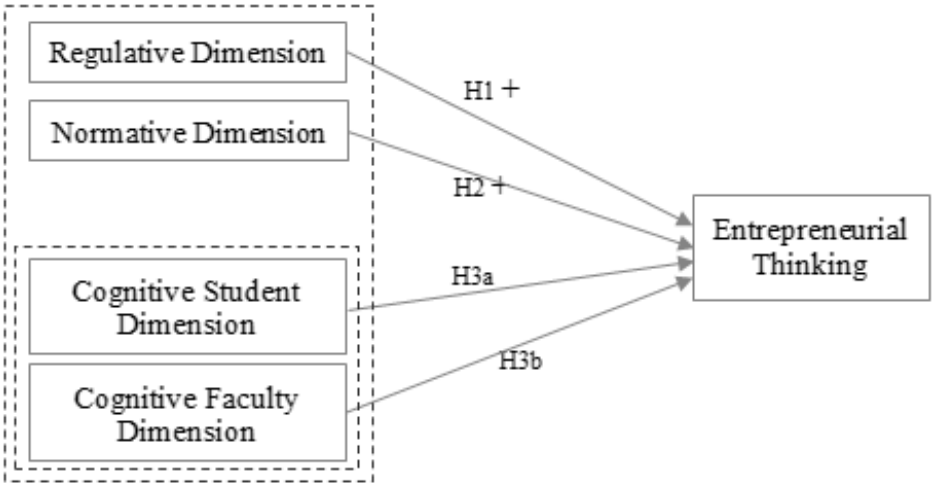
An individual's cognitive dimension involves the knowledge and skills acquired through social interactions that enable them to form new firms. Existing literature contends that CD includes students' knowledge and skills and learning outcomes (e.g., Oftedal et al., 2018; Aloulou, 2022). According to Armanurah et al. (2019), the significant role of the skills and knowledge provided at universities can serve as effective tools for empowering ET and lead to greater involvement in entrepreneurship activities. The CD has been proven to influence ET significantly and positively. For instance, Chiengkul et al. (2023), illustrated that entrepreneurs' growth is positively correlated with CD. Similarly, Junaid et al. (2019) examined entrepreneurship activities among women in Malaysia and Pakistan and found that cognitive dimensions are crucial in encouraging women to start businesses. Furthermore, the findings of Zhuang and Sun, (2023) support that the cognitive aspect influences entrepreneurial orientation, business growth, and new start-ups through entrepreneurship knowledge. Unexpectedly, the results of Oftedal and his colleagues (2018) showed the weak effect of CD on entrepreneurial intention.

Guided by this previous literature (such as Oftedal et al., 2018), our work classifies and focuses on two types of CD due to the lack of a measure of the institutional dimension of UE. The first group is "knowledge of fellow students" (herein CDST), and the second is "advice from faculty" (herein CDF). Since most of the evidence offered by existing research was less collected in Algeria, therefore, our third hypothesis:

H3a: CDST positively influences ET among female business students at Algerian universities.

H3b: CDF positively influences ET among female business students at Algerian universities.

Figure 1: Conceptual Framework and Hypotheses



Source(s): Author's work

Method

Sampling Methods and Data Collection

In our work, proportionate stratified random sampling is utilized to determine the appropriate number of questionnaires to be distributed. Geographic regions can be utilized as different geographic strata; therefore, the respondents were divided into three groups depending on the country's main geographic regions. In order to get as heterogeneous a group as possible, samples were taken from the North (Tissemsilt University), the East (Milla University), and the West (Bechar University), which were chosen because they represent the three different regions of the country, respectively. Thus, a sample of business students was randomly selected from these three Algerian Public Universities.

To carry out this research, the authors utilized a self-administered survey to collect data from university female business students. This method was appropriate for this research to investigate female students' entrepreneurial thinking. Moreover, a mature scale was adopted from the recent studies in the questionnaire to ensure its validity. To assure accuracy and preserve the items` meanings, they were translated into Arabic and reviewed by native speakers via a back-translation procedure (Dawson and

Dickinson, 1988). Data collection took place from March 2022 to August 2022 (Six months) with the assistance of unit coordinators and teachers. 413 of the 512 questionnaires distributed were totally completed and returned.

Variable Measurement

The variables of Entrepreneurial Thinking, Regulative Dimension, Normative Dimension, Faculty Cognitive Dimension, and Student Cognitive Dimension were all measured by adopting previously validated scales. First, for the independent variables, to examine the dimensions of the university environment, we adopt the measurements proposed by Oftedal et al. (2018). RD was measured through four items (RD1-RD4), and ND through six items (ND1-ND6). Next, the CD construct split into two distinct variables: Student Cognitive Dimension (CDST) with six items (CD1-CD6) and Faculty Cognitive Dimension (CDF) with three items (CD7-CD9) adapted also from Oftedal et al. (2018).

Second, in our work, the dependent variable (ET) is measured as a higher-order construct consisting of five lower-order constructs (Risk-Taking, Identifying Opportunities, Creativity and Innovation, and Tolerance of Ambiguity) that have already been utilized in past literature (such as Armanurah et al., 2019; 2021). For ET, we initially measured the Identifying Opportunities (OP) through sixteen items (OP1-OP16), then Risk-Taking (RT) with five items (RT1-RT5), Tolerance of Ambiguity (TA) with four items (TA1-TA4), and the Creative and Innovative (CI) with four items (CI1-CI4). To this end, a five-point Likert scale was utilized to assess all items.

Data Analysis Procedure

This work used the PLS-SEM method and the SmartPLS 4 software to evaluate the proposed model. We use PLS-SEM since it is considered more suitable for multivariate non-normality issues and supports complex phenomena (Hair et al., 2022). Moreover, scholars (such as Sarstedt et al., 2022; Hair et al., 2022) also document that PLS-SEM is the recommended statistical tool if the model includes higher-order constructs.

Respondent's Profile

Table 1 shows the demographics of the respondents.

Table 1: Respondents' profile

Demographic variables	Category	Frequency	(%)
Age	Under 23	134	55.6
	23–26	83	34.4
	Above 26	24	10
Qualification	Master's degree	236	2.1
	PhD	5	7.9
Marital Status	Married	19	7.9
	Single	222	92.1
Role models	Yes	72	29.9
	No	169	70.1
Previous self-employment experience	Yes	80	33.2
	No	161	66.8

Note: N = 241

Source: Author's own work

Analysis and Results

Preliminary Analysis

After dealing with missing values and univariate and multivariate outliers, 347 questionnaires were considered for further analysis. To ensure that the data is suitable for further investigation, the authors performed a preliminary analysis before the main analysis.

Firstly, the validity of the constructs was investigated through the Common Method variance (CMV) by applying Harman's Single-Factor test as recommended by Podsakoff et al. (2003). Using SPSS software, Harman's single factor test recorded 15.958% of the variance, which is within the limit (less than 50%). In other words, these confirmed that CMV was not an issue in our work.

Secondly, our work used the "Web Power online tool" to examine the multivariate normality of the collected data. Mardia's (1970) "Mardia's multivariate skewness and kurtosis" test reported that the data in this study did not have a multivariate normal distribution. Accordingly, the non-normality issue of the data provided yet another reason to use PLS-SEM (see Hair et al., 2022).

Lastly, the variance inflation factor (VIF), tolerance, and correlation matrix analyses were utilized to test multicollinearity. More specifically, the

findings (see Table 2) report there is no significant presence of multicollinearity since all the coefficients of the Correlations Matrix are below 0.9, as recommended by Hair et al. (2022). Furthermore, the research findings are not affected by multicollinearity, where VIF is below 3, and the tolerance level is greater than 0.60 (see Table 3; Sarstedt et al., 2022). Thus, it confirms no significant threat of multicollinearity.

Table 2: Correlations matrix

Constructs	RD	ND	CDST	CDF	PACT
RD	1				
ND	.116	1			
CDST	.183	.353	1		
CDF	.383	.280	.458	1	

Source: Authors' own work

Table 3: Tolerance and VIF values

Construct	Tolerance	VIF
RD	.853	1.173
ND	.858	1.166
CDST	.736	1.359
CDF	.686	1.458

Source: Authors' own work

Measurement Model Validation

The PLS-SEM was used to verify the collected data. This method will be used since it is more suitable for multivariate non-normality issues and complex models (Hair et al., 2022). PLS-SEM models are analyzed using a two-stage disjoint approach: the evaluation of the measurement model and the structural model. Initially, the statistical analyses in this work involved assessing the measurement model to ensure the constructs' reliability and validity. This was followed by the structural model, which examined the links between the endogenous and exogenous constructs (VIF, R2, Q2, Q2 predict, β and significance level). The Smart-PLS (Version 4.0.9.5) was employed to examine these two stages and subjected to several quality criteria tests.

To determine our model's fitness, the convergent and discriminant validities of the constructs were first investigated. As previously highlighted, our proposed model identifies only the dependent variable "ET" as a high-order (HOC) construct type II, consisting of five low-order (LOC) constructs. Following Becker et al. (2022), we applied the disjoint two-stage method to examine the data and estimate HOC. The evaluation of the reflective model is in the first stage, and then the formative model is evaluated in the second stage (see Hair et al., 2022).

In the first stage, the authors assessed the convergent and discriminant validities of all lower constructs involved in our measurement. Initially, the convergent validity was checked through these five measures: Cronbach's alpha, composite reliability (CR), Rho-A, outer loadings, and average variance extracted (AVE) (Hair et al., 2022). The loadings of all items (Table 2) surpassed the acceptable threshold (> 0.5), except for the 16 items that have been deleted (≤ 0.40). Additionally, the Rho-A and CR of all constructs meet the required threshold (> 0.7), and for the AVE, all constructs surpass the criterion "0.5" (Hair et al., 2022). Further, the findings also reveal that Cronbach's alpha of a few constructs is slightly below 0.7, which is acceptable (> 0.673). Thus, the results of Table 4 meet the required criterion and confirm the convergent validity of the constructs in this article.

Table 4: First-order constructs reliability and validity test

First-order Construct	**Cronbach's Alpha**	**CR**	**Rho_A**	**AVE**
OP	0.700	0.814	0.715	0.524
RT	0.719	0.817	0.797	0.533
CI	0.715	0.821	0.725	0.535
TA	0.708	0.811	0.825	0.524
RD	0.838	0.891	0.853	0.673
ND	0.725	0.828	0.751	0.548
CDST	0.760	0.836	0.784	0.507
CDF	0.673	0.815	0.699	0.597

Source: Author's own work

Next, in this work, the discriminant validity of our model was checked using the Heterotrait-Monotrait (HTMT) ratio (Henseler et al., 2015) as well as the Fornell and Larcker (1981) criterion. The results mentioned are

shown in Tables 5 and 6, respectively, and all are within the parameters established by Hair et al. (2022).

Table 5: Fornell-Larcker's results

	OP	**RT**	**TA**	**CI**	**RD**	**ND**	**CDST**	**CDF**
OP	0.724							
RT	0.479	0.730						
TA	0.223	0.223	0.724					
CI	0.175	0.222	0.316	0.731				
RD	0.032	-0.023	0.207	0.130	0.821			
ND	0.345	0.332	0.114	0.185	0.073	0.740		
CDST	0.347	0.228	0.197	0.122	0.179	0.318	0.712	
CDF	0.310	0.198	0.200	0.152	0.382	0.231	0.470	0.773

Source: Authors' own work

Table 6: Discriminant validity (HTMT)

	OP	**RT**	**CI**	**TA**	**RD**	**ND**	**CDST**	**CDF**
OP								
RT	0.657							
CI	0.241	0.324						
TA	0.329	0.326	0.451					
RD	0.113	0.120	0.157	0.233				
ND	0.480	0.446	0.259	0.207	0.145			
CDST	0.436	0.302	0.176	0.254	0.238	0.421		
CDF	0.405	0.271	0.210	0.244	0.512	0.319	0.659	

Source: Authors' own work

In stage 2, as suggested by Becker et al. (2022), our study measured ET as HOC type II, which is reflective-formative. Following Hair et al.'s (2022) guidelines, we applied the two-stage method to assess the formative measurement for ET. In addition to the variance inflation factor (VIF), our work also assesses the outer weights to examine the ET's validity. Using the scores of latent variables, table 5 reveals no issues with multicollinearity, as the VIF values were less than 3 for all items, as Sarstedt et al. (2022) recommended. Furthermore, the outer weights' bootstrapped results show

that two indicators turn out to be significant ($p< 0.05$) (Sarstedt et al., 2022) except "CI" and "TA" (respectively; weight = 0.180, p-value = 0.120; weight = 0.124, p-value = 0.223). Even though the outer weights of "CI" and "TA" are not significant, these indicators must be retained because their loading was significant (see Hair et al., 2022). Hence, the findings reveal that the quality of the HOC (ET) is verified because all conditions were met (see Table 7; Sarstedt et al., 2022).

Table 7: Validation of the Higher-order construct

Higher order construct	Formative indicators	Outer weights (Outer loadings)	VIF (<3)	t-value	P-Value
ET	OP	0.703	1.325	5.065	0.000
	RT	0.320	1.345	1.894	0.029
	CI	0.413	1.144	2.677	0.004
	TA	0.409	1.159	2.596	0.005

Source: Authors' own work

Structural Model and Hypotheses Testing

Afterward, the measurement model was tested, and we estimated the quality of our structural model through a coefficient of determination (R^2), predictive relevance (Q^2), path coefficients as well as the PLSpredict-based out-of-sample predictive power (see Hair et al., 2022).

First, this study adopted the standardized root mean square residual (SRMR) to measure the model fit. Henseler et al. (2016) suggested that a cut-off value of less than 0.08 for the SRMR indicates a good fit. This study's SRMR value was 0.078, indicating a good model fit. Following Falk and Miller (1992), the strength of each structural path in the model is determined by the R^2 values, which must be larger than or equal to 0.1 in order to ascertain that the endogenous variable is adequately explained. The results of R^2 indicate that OP, RT, TA, and CI explain 19.6% of the variance of ET. Based on Cohen's criteria (1992), this result explains that the PLS model was nearly substantial. Furthermore, the results showed that Q^2 values of the endogenous construct are above zero (0.183). These results reveal sufficient predictive relevance of our model.

Adopting the recommendations of Shmueli et al. (2019), the authors expanded further by the inclusion of another predictive relevance analysis,

namely the PLSpredict. Table 8, which displays the results of the prediction analysis, indicates that all Q2 predicted values are positive for all indicators except one. Further, the PLSpredict results have shown that the RMSE (root-mean-square error) obtained by PLS-SEM is smaller than the RMSE found by the LM (linear model) for all indicators. As suggested by Liengaard et al. (2021), the CVPAT "cross-validated predictive ability test" should be included in the assessment of PLS-SEM results. Thus, this ability occurs since the suggested model beats the IA benchmark (Sharma et al., 2023; average loss difference =-0.024, p=0.397), as well as is strong because the proposed model makes more accurate predictions than the LM (Sharma et al., 2023; average loss difference =-0.033, p=0.000).

After confirming the model's satisfactory predictive and explanatory power, the analysis then shifted to confirm the hypothesized paths of the variables. The hypothesized relationships were examined via the bootstrap procedure, and p values were accordingly produced. The findings display that out of four hypotheses, three were confirmed (see Table 8). As per the hypotheses, the SEM results demonstrate that the RD has a negative correlation with ET and a non-significant effect (β= -0.041, $p > 0.05$). Therefore, H1 was rejected. The findings also outline that NDs have a strong positive and significant effect on ET (β= 0.297, $p = 0.000$); thus, hypothesis H2 is accepted. Likewise, the study's findings also found support for Hypothesis H3a concerning the positive and significant effect of CDST on ET (0.186, $p = 0.007$) and Hypothesis H3b for the significant and positive effect of CDF on ET ($\beta = 0.195$, $p = 0.005$). The study, therefore, retains H3a, H3b.

Table 8: Structural model results

Path	Path coefficient	T statistics	Results
H1: RD →ET	0.345	0.398	Not Supported
H2: ND →ET	0.000	3.758	Supported
H3a: CSD →ET	0.007	2.437	Supported
H3b: CDF →ET	0.005	2.575	Supported

Source: Authors' own work

Discussion, Limitations, and Conclusion

Discussion

The promotion of entrepreneurial thinking among students has become a priority to contribute to society's development (Secundo et al., 2023). Through different modalities, universities can enhance ET among female students. Accordingly, the purpose of our work was to employ the institutional theory view to better grasp the relation that exists between the UE and ET in the Algeria context. Similarities and differences have been identified in the three dimensions of analysis (Regulative, Normative, and Cognitive Dimension).

The results of this study showed that female business students' entrepreneurial thinking was not influenced by the regulative dimension. This finding was consistent with existing entrepreneurship work in the literature. The non-significant effect of RD on female entrepreneurial thinking was also found by Chiengkul et al. (2023), and Chen et al. (2023). Meanwhile, the non-significant effect of RD on ET was also found by Li's (2021). There may be several explanations for these findings. In Algerian universities, the rules, practices, and support systems are not seen as empowering female students' new firm foundations. In addition, these results perhaps could be related to Algeria's economic background or insufficient regulatory environment for entrepreneurial start-ups. Therefore, improving RD will reduce the fear of failure and promote women and men to engage in entrepreneurship (Wang et al., 2019). Besides that, this finding is at variance with related earlier literature (e.g., Aloulou, 2022; Oftedal et al., 2018), which documents the significant positive effect of the regulative environment on entrepreneurial activities. Hence, since the relation between the RD and ET is under-explored in the literature, it needs to be tested further.

The subsequent results of our research pertain to the normative dimensions. The results of our study confirmed that the ND is the primary driving force behind female students' ET. These findings are consistent with Chen et al. (2023), who support the idea that ND can compensate for the lack of entrepreneurial cognition and promote female entrepreneurship. Likewise, Li et al. (2021) showed that NDs are the most important causal recipe for achieving a high TEA rate for females. This viewpoint is also supported by Junaid et al. (2019). This means that there are supportive norms or values in Algerian universities that encourage and support female

students in creating their businesses. Our findings are also similar to those in earlier literature, which posit the claim that ND represented by norms and values within society plays an essential role in enhancing entrepreneurship self-identity (e.g., Boucher et al., 2023; Ndofirepi, 2020; Tlaiss and Kauser, 2019; Oftedal et al., 2018; Ogunsade et al., 2021). Nonetheless, these results were not in line with the results of recent studies that showed that ND in the environment constrains females from starting entrepreneurial activities (e.g., Chang & Xu, 2023). Our results also contrast with the few studies whose findings queried the relevance of ND that raises and supports people in creating their activities (e.g., Zhuang & Sun, 2023; Wang et al., 2019).

Finally, our findings concur with extant literature on entrepreneurship (Wang et al., 2019; Chiengkul et al., 2023), which indicated the significant influence of the cognitive dimension on entrepreneurial activities. The CD represents the skills and knowledge obtainable available to university students. Our findings are in line with the study by Pergelova et al. (2023), showing that females are better able to develop when their intentions are aroused by receiving education or training on creating business. There is an echo between the CD and entrepreneurship education; both develop and enhance enterprising knowledge and skills to better increase female business activities (see Chen et al., 2023). Indeed, Hanandeh et al. (2021) and Armanurah et al. (2019) convincingly demonstrated that knowledge and skills related to entrepreneurial start-ups improve ET. In spite of its importance, however, our results also contradict the work of Oftedal et al. (2018), who established that none of the CD (CDST and CDF) seemed to be attached to entrepreneurial intentions. Thus, it justifies that universities should develop suitable entrepreneurial skills and knowledge for female students' "cognitive dimension" of practical entrepreneurial needs.

An interesting feature of our study is that the results are significant, except RD (Table 6). We argue that the development of ET should not only be about knowledge and skills relating to entrepreneurship within universities. Instead, universities should aim to develop laws, rules, and regulations that encourage female students to start or explore opportunities for entrepreneurial start-ups with their partners. We strongly believe that the institutional support provided to female students for risk-taking will enable them to pursue their chosen careers and foster ET. Thus, the university community can develop their ET only when the conducive environment within universities relating to entrepreneurship is further promoted.

Limitations and Future Research

The present work still has some limitations and offers interesting opportunities for future studies. Initially, our work is executed in the context of Algeria's developing economy, and it focuses solely on female Algerian students. This is a point requiring careful consideration before generalizing. It is recommended that future studies investigate other regional areas or developing economic nations. Moreover, in our work, we did not bring up the issue of additional control variables (such as family influence, age, working experience, and educational levels) to determine this relationship. We believe those issues might have an impact and which might be an option to be explored in future studies. Finally, the qualitative approach could offer deeper insights into entrepreneurial thinking within the universities, strengthening the overall quality and reliability of the results presented in our study (Kudo et al., 2024).

Conclusion

Promoting entrepreneurial thinking and encouraging entrepreneurial start-ups is essential for job creation and growth. Therefore, universities are anticipated to have a significant role in stimulating entrepreneurial doing (Çera et al., 2021). Highlighting developing countries (e.g., Algeria), the current study enhances comprehension of how the university environment influences female students' entrepreneurship thinking. Recent studies have called for more investigation of the influence of UE on female students' entrepreneurial activities (Pinheiro et al., 2023) using IT (e.g., Xiao et al., 2022; He et al., 2020). For that, this work sought to address this research gap by examining the influence of UE on female students ET. Using Scott's (1995) institutional framework, the current research is the first attempt to fill the gap and provides a novel analysis of the precursors that enhance female students' entrepreneurial thinking. In an underexplored educational environment in a developing nation, our research highlights the effect of the institutional university environment (normative, cognitive, and regulative dimensions) on female students` ET. For this purpose, a sample of female students at Algerian universities was selected. Through the data analysis, our results showed that the normative dimension and cognitive dimension positively influence female students' entrepreneurial thinking. Besides, the study revealed that the regulative dimension does not impact entrepreneurial thinking among female students. These findings were discussed, and

interesting future study directions were provided to help ET researchers and scholars uncover useful insights about this subject to find more evidence for the findings' generalizability. Importantly, the findings from this present study provide evidence-based insights that may guide policymakers in establishing appropriate regulations that can improve female students' entrepreneurial thinking in the future. Finally, universities need to strengthen their laws, rules, and regulations developed to push their key role in stimulating entrepreneurial thinking and doing.

References

[1] **Ahsan, R.** (2023). Female academic entrepreneurship: evidence from a developing country. In Emerald Publishing Limited eBooks (pp. 113–139). https://doi.org/10.1108/978-1-83982-780-820231005

[2] **Ali, I., Ali, M., & Badghish, S.** (2019). Symmetric and asymmetric modeling of entrepreneurial ecosystem in developing entrepreneurial intentions among female university students in Saudi Arabia. *International Journal of Gender and Entrepreneurship*, *11*(4), 435–458. https://doi.org/10.1108/ijge-02-2019-0039

[3] **Ali, J., Jabeen, Z., & Burhan, M.** (2022). Measuring factors influencing entrepreneurial intention across gender in India: evidence from Global Entrepreneurship Monitor (GEM) Database. *Journal of Research in Marketing and Entrepreneurship*, *25*(1), 63–82. https://doi.org/10.1108/jrme-08-2021-0105

[4] **Aljarodi, A., Thatchenkery, T., & Urbano, D.** (2023). The influence of institutions on early-stage entrepreneurial activity: a comparison between men and women in Saudi Arabia. *Journal of Entrepreneurship in Emerging Economies*, *15*(5), 1028–1049. https://doi.org/10.1108/jeee-02-2021-0076

[5] **Aloulou, W. J.** (2022). The influence of institutional context on entrepreneurial intention: evidence from the Saudi young community. *Journal of Enterprising Communities*, *16*(5), 677–698. https://doi.org/10.1108/jec-02-2021-0019

[6] **Armanurah, M., Norashidah, H., Sahadah Haji, A., & Awanis Ku, I.** (2021). The Contribution of University Environmental Elements in Nurturing Students' Entrepreneurial Thinking: A Comparative Study. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(3), 1175–1184. https://doi.org/10.17762/turcomat.v12i3.864

[7] **Armanurah, M., Syahrina, A., Awanis Ku, I., & Norashidah Bint, H.** (2019). Entrepreneurship Education as a Way of Cultivating Entrepreneurial Thinking among Students of Malaysian Public Higher Learning Institutions.

International Journal of Social Science and Humanity, 97–102. https://doi.org/10.18178/ijssh.2019.v9.998

[8] **Baron, R. A.** (2006). Opportunity Recognition as Pattern Recognition: How Entrepreneurs "Connect the Dots" to Identify New Business Opportunities. *Academy of Management Perspectives*, *20*(1), 104–119. https://doi.org/10.5465/amp.2006.19873412

[9] **Becker, J., Cheah, J., Gholamzade, R., Ringle, C. M., & Sarstedt, M**. (2022). PLS-SEM's most wanted guidance. *International Journal of Contemporary Hospitality Management*, *35*(1), 321-346. https://doi.org/10.1108/ijchm-04-2022-0474

[10] **Boucher, S., Cullen, M., & Calitz, A. P.** (2023). Culture, entrepreneurial intention and entrepreneurial ecosystems: evidence from Nelson Mandela Bay, South Africa. *Journal of Entrepreneurship in Emerging Economies*. *ahead-of-print* (ahead-of-print). https://doi.org/10.1108/jeee-05-2022-0156

[11] **Busenitz, L., Gómez, C., & Spencer, J.** (2000). Country Institutional Profiles: Unlocking Entrepreneurial Phenomena. *Academy of Management Journal*, *43*(5), 994–1003. https://doi.org/10.5465/1556423

[12] **Cabrera, E. M., & Mauricio, D**. (2017). Factors affecting the success of women's entrepreneurship: a review of literature. *International Journal of Gender and Entrepreneurship*, *9*(1), 31–65. https://doi.org/10.1108/ijge-01-2016-0001

[13] **Çera, G., Çera, E., Rozsa, Z., & Bilan, S.** (2021). Entrepreneurial intention as a function of university atmosphere, macroeconomic environment and business support: a multi-group analysis. *European Journal of Training and Development*, *45*(8/9), 706–724. https://doi.org/10.1108/ejtd-08-2019-0148

[14] **Chang, A. Y., & Xu, Y.** (2023). Decoding underperformance of entrepreneurship at the bottom of the pyramid: a literature review of the field. *New England Journal of Entrepreneurship*, *26*(2), 88–106. https://doi.org/10.1108/neje-10-2022-0093

[15] **Chen, C., Huang, Y., & Wu, S.** (2023). How do institutional environment and entrepreneurial cognition drive female and male entrepreneurship from a configuration perspective?. *Gender in Management: An International Journal*, *38*(5), 653–668. https://doi.org/10.1108/gm-04-2022-0124

[16] **Chiengkul, W., Tantipanichkul, T., Boonchom, W., Phuangpornpitak, W., & Suphan, K.** (2023). Social entrepreneurship of small and medium-sized entrepreneurs in Thailand: influence of institutional environment, entrepreneurial passions, and entrepreneurial self-efficacy. *Social Enterprise Journal*, *19*(4), 370-389. https://doi.org/10.1108/sej-01-2023-0005

[17] **Cohen, J.** (1992). Statistical Power Analysis. *Current Directions in Psychological Science*, *1*(3), 98–101. https://doi.org/10.1111/1467-8721.ep10768783

[18] **Costa, J., & Pita, M.** (2020). Appraising entrepreneurship in Qatar under a gender perspective. *International Journal of Gender and Entrepreneurship*, *12*(3), 233–251. https://doi.org/10.1108/ijge-10-2019-0146

[19] **Dawson, S. C., & Dickinson, D.** (1988). Conducting International Mail Surveys: The Effect of Incentives on Response Rates with an Industry Population. *Journal of International Business Studies*, *19*(3), 491–496. https://doi.org/10.1057/palgrave.jibs.8490387

[20] **Dehghanpour Farashah, A.** (2015). The effects of demographic, cognitive and institutional factors on development of entrepreneurial intention: Toward a socio-cognitive model of entrepreneurial career. *Journal of International Entrepreneurship*, *13*(4), 452–476. https://doi.org/10.1007/s10843-015-0144-x

[21] **Dhar, S., Farzana, T., & Abedin, S. S. I.** (2022). Pushed or Pulled into Entrepreneurship? Motivations behind Entrepreneurial Entry for Women with Disabilities in Bangladesh. *Journal of Women's Entrepreneurship and Education*, (3–4), 103–125. https://doi.org/10.28934/jwee22.34.pp103-125

[22] **Drakpa, D., Loday, S., & Yangchen, K.** (2022). Factors affecting entrepreneurial intention of the female students of Business Colleges of Bhutan: Applying the Theory of planned Behaviour. *Journal of Women's Entrepreneurship and Education*, (1–2), 170–186. https://doi.org/10.28934/jwee22.12.pp170-186

[23] **Falk, R. F., & Miller, N. B.** (1992). A Primer for Soft Modeling. University of Akron Press, Akron, Ohio.

[24] **Fornell, C., & Larcker, D. F.** (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, *18*(3), 382–388. https://doi.org/10.1177/002224378101800313

[25] **Garud, R., Hardy, C., & Maguire, S.** (2007). Institutional Entrepreneurship as Embedded Agency: An introduction to the special issue. *Organization Studies*, *28*(7), 957–969. https://doi.org/10.1177/0170840607078958

[26] **Ghazali, E. M., Mutum, D. S., & Javadi, H. H.** (2021). The impact of the institutional environment and experience on social entrepreneurship: a multi-group analysis. *International Journal of Entrepreneurial Behaviour & Research*, *27*(5), 1329–1350. https://doi.org/10.1108/ijebr-05-2020-0332

[27] **Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M.** (2022). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) (3 ed). Thousand Oaks, CA: Sage.

[28] **Hanandeh, R., Alnajdawi, S., Almansour, A. Y., & Elrehail, H.** (2021). The impact of entrepreneurship education on innovative start-up intention: the mediating role of entrepreneurial mind-sets. *World Journal of*

Entrepreneurship, Management and Sustainable Development, *ahead-of-print* (ahead-of-print). https://doi.org/10.1108/wjemsd-02-2020-0016

[29] **Hatoum, H., Haddoud, M. Y., & Mordi, C.** (2023). The contextual embeddedness of female entrepreneurship: investigating the influence of macro and motherhood factors in Bahrain. *Journal of Small Business and Enterprise Development*, *30*(4), 804–827. https://doi.org/10.1108/jsbed-12-2021-0506

[30] **He, J., Nazari, M., Zhang, Y., & Cai, N.** (2020). Opportunity-based entrepreneurship and environmental quality of sustainable development: A resource and institutional perspective. *Journal of Cleaner Production*, *256*, 120390. https://doi.org/10.1016/j.jclepro.2020.120390

[31] **Henseler, J., Hubona, G. S., & Ray, P. A.** (2016). Using PLS path modeling in new technology research: updated guidelines. *Industrial Management and Data Systems*, *116*(1), 2–20. https://doi.org/10.1108/imds-09-2015-0382

[32] **Henseler, J., Ringle, C. M., & Sarstedt, M.** (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

[33] **Junaid, D., He, Z., Yadav, A., & Asare-Kyire, L.** (2019). Whether analogue countries exhibit similar women entrepreneurial activities? *Management Decision*, *58*(4), 759–772. https://doi.org/10.1108/md-06-2018-0681

[34] **Kivalya, N. Y., & Caballero-Montes, T.** (2023). Understanding the dimensions of women entrepreneurs' empowerment: a systematic review of the microfinance literature and avenues for research. *International Journal of Gender and Entrepreneurship*. https://doi.org/10.1108/ijge-06-2023-0162

[35] **Krueger, N. F.** (2007). What Lies Beneath? The Experiential Essence of Entrepreneurial Thinking. *Entrepreneurship Theory and Practice*, *31*(1), 123–138. https://doi.org/10.1111/j.1540-6520.2007.00166.x

[36] **Kudo, L. K., McPhail, R., & Despotovic, W. V.** (2024). Retaining the repatriate by organisation in developing countries (in Africa): understanding the decision-making point (stay or leave) of the expatriate. *Employee Relations*, *ahead-of-print* (ahead-of-print). https://doi.org/10.1108/er-10-2020-0466

[37] **Lahikainen, K., Kolhinen, J., Ruskovaara, E., & Pihkala, T.** (2018). Challenges to the development of an entrepreneurial university ecosystem: The case of a Finnish university campus. *Industry and Higher Education*, *33*(2), 96–107. https://doi.org/10.1177/0950422218815806

[38] **Lewellyn, K., & Muller-Kahle, M. I.** (2016). A configurational approach to understanding gender differences in entrepreneurial activity: a fuzzy set

analysis of 40 countries. *International Entrepreneurship and Management Journal*, *12*(3), 765–790. https://doi.org/10.1007/s11365-015-0366-3

[39] **Li, Y., Wu, J., Zhang, D., & Li, L.** (2021). Gendered institutions and female entrepreneurship: a fuzzy-set QCA approach. *Gender in Management: An International Journal*, *36*(1), 87–107. https://doi.org/10.1108/gm-07-2019-0110

[40] **Liengaard, B., Sharma, P. N., Hult, G. T. M., Jensen, M. H., Sarstedt, M., Hair, J. F., & Ringle, C. M.** (2021). Prediction: Coveted, Yet Forsaken? Introducing a Cross-Validated Predictive Ability Test in Partial Least Squares Path Modeling. *Decision Sciences*, *52*(2), 362–392. https://doi.org/10.1111/deci.12445

[41] **Low, S. P., Gao, S., & Ng, E. P. J.** (2019). Future-ready project and facility management graduates in Singapore for industry 4.0. *Engineering, Construction and Architectural Management*, *28*(1), 270–290. https://doi.org/10.1108/ecam-08-2018-0322

[42] **Manjaly, N. B., Joseph, G., Nimmi, P. M., & S, K.** (2022). Entrepreneurial intention of Indian Women university students. *Journal of Women's Entrepreneurship and Education*, (3–4), 273–290. https://doi.org/10.28934/jwee22.34.pp273-290

[43] **Mardia, K. V. (1970).** Measures of multivariate skewness and kurtosis with applications. *Biometrika*, *57*(3), 519–530. https://doi.org/10.1093/biomet/57.3.519

[44] **Mehtap, S., Pellegrini, M. M., Caputo, A., & Welsh, D. H.** (2017). Entrepreneurial intentions of young women in the Arab world. *International Journal of Entrepreneurial Behaviour & Research*, *23*(6), 880–902. https://doi.org/10.1108/ijebr-07-2017-0214

[45] **Messikh, A.** (2021). The entrepreneurial intention of Algerian women (a sample study of SKIKDA University female students). *Journal of Women's Entrepreneurship and Education*, (3–4), 134–150

[46] **Moraes, G. H. S. M. D., Fischer, B. B., Guerrero, M., Rocha, A. K. L. D., & Schaeffer, P. R.** (2021). An inquiry into the linkages between university ecosystem and students' entrepreneurial intention and self-efficacy. *Innovations in Education and Teaching International*, 1–12. https://doi.org/10.1080/14703297.2021.1969262

[47] **Muscio, A., Quaglione, D., & Ramaciotti, L.** (2016). The effects of university rules on spinoff creation: The case of academia in Italy. *Research Policy*, *45*(7), 1386–1396. https://doi.org/10.1016/j.respol.2016.04.011

[48] **Mustafa, M., Lee, C., & Galloway, J. E.** (2023). The importance of context: How university entrepreneurial climates enhances entrepreneurship in tourism and hospitality graduates. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *33*, 100453. https://doi.org/10.1016/j.jhlste.2023.100453

[49] **Nasr, L., Mooney, C. H., Gur, F. A., Kabadayi, S., Renko, M., & Vink, J.** (2019). Transformative service research, service design, and social entrepreneurship. *Journal of Service Management*, *31*(1), 24–50. https://doi.org/10.1108/josm-05-2019-0139

[50] **Ndofirepi, T. M.** (2021). How spatial contexts, institutions and self-identity affect entrepreneurial intentions. *Journal of Entrepreneurship in Emerging Economies*, *13*(2), 153-174. https://doi.org/10.1108/jeee-12-2019-0182

[51] **Oftedal, E. M., Iakovleva, T., & Foss, L.** (2018). University context matter: An institutional perspective on entrepreneurial intentions of students. *Journal of Education and Training*, *60*(7/8), 873–890. https://doi.org/10.1108/et-06-2016-0098

[52] **Ogunsade, A. I., Obembe, D., Woldesenbet, K., & Kolade, S.** (2021). Entrepreneurial attitudes among university students: the role of institutional environments and cultural norms. *Entrepreneurship Education*, *4*(2), 169–190. https://doi.org/10.1007/s41959-021-00050-y

[53] **Osmani, A., & Beloucif, A.** (2021). Challenges of Algeria's Economic Development: A Youth Entrepreneurship Perspective. In Emerald Publishing Limited eBooks (pp. 173–191). https://doi.org/10.1108/978-1-80071-322-220211009

[54] **Pergelova, A., Angulo-Ruiz, F., Manolova, T. S., & Yordanova, D.** (2023). Entrepreneurship education and its gendered effects on feasibility, desirability and intentions for technology entrepreneurship among STEM students. *International Journal of Gender and Entrepreneurship*, *15*(2), 191–228. https://doi.org/10.1108/ijge-08-2022-0139

[55] **Pinheiro, G. T., Moraes, G. H. S. M. D., & Fischer, B. B.** (2023). Student entrepreneurship and perceptions on social norms and university environment: evidence from a developing country. *Journal of Entrepreneurship in Emerging Economies*, *15*(4), 746-765. https://doi.org/10.1108/jeee-03-2021-0121

[56] **Podsakoff, P. M., MacKenzie, S. B., Lee, J., & Podsakoff, N. P.** (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

[57] **Quagrainie, F. A.** (2023). Do psychological and social factors drive female youth entrepreneurial readiness: the moderating effect of entrepreneurial education. *Journal of Entrepreneurship and Public Policy, ahead-of-print* (ahead-of-print) https://doi.org/10.1108/jepp-01-2023-0002

[58] **Rafiki, A., & Nasution, F. N.** (2019). Business success factors of Muslim women entrepreneurs in Indonesia. *Journal of Enterprising Communities*, *13*(5), 584–604. https://doi.org/10.1108/jec-04-2019-0034

[59] **Rahman, M. M., Salamzadeh, A., & Tabash, M. I**. (2022). Antecedents of Entrepreneurial Intentions of Female Undergraduate Students in Bangladesh:

A Covariance-Based Structural Equation Modeling Approach. *Journal of Women's Entrepreneurship and Education*, (1–2), 137–153. https://doi.org/10.28934/jwee22.12.pp137-153

[60] **Salamzadeh, A., Radović-Marković, M., & Ghiat, B.** (2023). Women entrepreneurship in Algeria. *Environments for Women Entrepreneurship in North Africa*, 55-70. https://doi.org/10.1142/9789811276125_0003

[61] **Saoula, O., Shamim, A., Ahmad, M. J., & Abid, M. F.** (2023). Do entrepreneurial self-efficacy, entrepreneurial motivation, and family support enhance entrepreneurial intention? The mediating role of entrepreneurial education. *Asia Pacific Journal of Innovation and Entrepreneurship*, *ahead-of-print* (ahead-of-print). https://doi.org/10.1108/apjie-06-2022-0055

[62] **Sarstedt, M., Hair, J. F., Pick, M., Liengaard, B., Radomir, L., & Ringle, C. M**. (2022). Progress in partial least squares structural equation modeling use in marketing research in the last decade. *Psychology & Marketing*, *39*(5), 1035–1064. https://doi.org/10.1002/mar.21640

[63] **Scott, W. R.** (1995). Institutions and Organizations. Sage Publications: Thousand Oaks, CA, USA.

[64] **Scott, W. R.** (2008). Institutions and Organizations: Ideas and Interests, 3rd ed. SAGE Publications, Thousand Oakes, CA.

[65] **Secundo, G., Mele, G., Passiante, G., & Albergo, F.** (2021). University business idea incubation and stakeholders' engagement: closing the gap between theory and practice. *European Journal of Innovation Management*, *26*(4), 1005-1033. https://doi.org/10.1108/ejim-08-2021-0435

[66] **Sharafizad, F., Brown, K., Jogulu, U., & Omari, M.** (2022). Avoiding the burst pipeline post-COVID-19: drivers of female academic careers in Australia. *Personnel Review*, *ahead-of-print* (ahead-of-print). https://doi.org/10.1108/pr-12-2021-0909

[67] **Sharma, P. N., Liengaard, B., Hair, J. F., Sarstedt, M., & Ringle, C. M.** (2023). Predictive model assessment and selection in composite-based modeling using PLS-SEM: extensions and guidelines for using CVPAT. *European Journal of Marketing*, *ahead-of-print* (ahead-of-print). https://doi.org/10.1108/ejm-08-2020-0636

[68] **Shepherd, D. A., & Krueger, N. F.** (2002). An Intentions–Based Model of Entrepreneurial Teams' Social Cognition*. *Entrepreneurship Theory and Practice*, *27*(2), 167–185. https://doi.org/10.1111/1540-8520.00005

[69] **Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J., Ting, H., Vaithilingam, S., & Ringle, C. M.** (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. *European Journal of Marketing*, *53*(11), 2322–2347. https://doi.org/10.1108/ejm-02-2019-0189

[70] **Sobhan, N., & Hassan, A.** (2023). The effect of institutional environment on entrepreneurship in emerging economies: female entrepreneurs in

Bangladesh. *Journal of Entrepreneurship in Emerging Economies*, *16*(1), 12-32. https://doi.org/10.1108/jeee-01-2023-0028

[71] **Soomro, B. A., Abdelwahed, N. a. A., & Shah, N.** (2022). Entrepreneurship barriers faced by Pakistani female students in relation to their entrepreneurial inclinations and entrepreneurial success. *Journal of Science & Technology Policy Management*, *ahead-of-print* (ahead-of-print). https://doi.org/10.1108/jstpm-12-2021-0188

[72] **Tlaiss, H. A., & Kauser, S.** (2019). Entrepreneurial Leadership, Patriarchy, Gender, and Identity in the Arab World: Lebanon in Focus. Journal of Small Business Management, *57*(2), 517–537. https://doi.org/10.1111/jsbm.12397

[73] **Urban, B., & Kujinga, L.** (2017). The institutional environment and social entrepreneurship intentions. *International Journal of Entrepreneurial Behaviour & Research*, *23*(4), 638–655. https://doi.org/10.1108/ijebr-07-2016-0218

[74] **Valdez, M. E., & Richardson, J. E.** (2013). Institutional determinants of Macro–Level entrepreneurship. *Entrepreneurship Theory and Practice*, *37*(5), 1149–1175. https://doi.org/10.1111/etap.12000

[75] **Víquez-Paniagua, A. G., Leiva, J. C., & Mora-Esquivel, R.** (2022). Entrepreneurial attitude in female Latin American university students: internal and external influences. *Management Research*, *21*(3), 284–304. https://doi.org/10.1108/mrjiam-10-2021-1237

[76] **Wang, J., Li, Y., & Long, D.** (2019). Gender gap in entrepreneurial growth ambition. *International Journal of Entrepreneurial Behavior & Research*, *25*(6), 1283–1307. https://doi.org/10.1108/ijebr-04-2018-0248

[77] **Widiyanto, W., Yulianto, A., Feriady, M., & Nurkhin, A.** (2023). Learning models of women entrepreneurship in Indonesia. *Journal of Women's Entrepreneurship and Education*, (1–2), 32–50. https://doi.org/10.28934/jwee23.12.pp32-50

[78] **Xiao, Z., Chen, X., Dong, M. C., & Gao, S.** (2022). Institutional support and firms' entrepreneurial orientation in emerging economies. *Long Range Planning*, *55*(1), 102106. https://doi.org/10.1016/j.lrp.2021.102106

[79] **Yusuf, N., Jamjoom, Y., & Saci, K.** (2023). Entrepreneurial orientation across gender in Saudi Arabia: evidence from the Adult Population Survey (APS) of Global Entrepreneurship Monitor (GEM). *Journal of Entrepreneurship in Emerging Economies*, *16*(1), 134-158. https://doi.org/10.1108/jeee-12-2022-0375

[80] **Zhuang, J., & Sun, H.** (2023). Impact of institutional environment on entrepreneurial intention: The moderating role of entrepreneurship education. *The International Journal of Management Education*, *21*(3), 100863. https://doi.org/10.1016/j.ijme.2023.100863

Article history: Received: December 17th, 2023
Accepted March 4th, 2024

DOI: 10.28934/jwee24.12.pp141-156
JEL: I23, L26

ORIGINAL SCIENTIFIC PAPER

The Role of Gender in Fostering Interest in Entrepreneurship in Indonesia

Riyanto Efendi [1]
Universitas Pendidikan Indonesia, Faculty of Economics and Business Education, Department of Economic Education, Isola, Sukasari, Bandung City, West Java 40154, Indonesia
Universitas Jember, Faculty of Teacher Training and Education, Department of Economic Education, Krajan Timur, Kab. Jember, East Java 68121, Indonesia
Hari Mulyadi [2]
Universitas Pendidikan Indonesia, Faculty of Economics and Business Education, Department of Economic Education, Isola, Sukasari, Bandung City, West Java 40154, Indonesia
Disman [3]
Universitas Pendidikan Indonesia, Faculty of Economics and Business Education, Department of Economic Education, Isola, Sukasari, Bandung City, West Java 40154, Indonesia
Imas Purnamasari [4]
Universitas Pendidikan Indonesia, Faculty of Economics and Business Education, Department of Economic Education,Isola, Sukasari, Bandung City, West Java 40154, Indonesia
Prisilia Angel Tantri [5]
Universitas Insan Cendekia Mandiri, Faculty of Economics, Department of Management, Sukajadi, Bandung City, West Java 40162, Indonesia

[1] Corresponding author, e-mail: riyantoefendi@unej.ac.id; riyantoefendi61@gmail.com
[2] E-mail: harimulyadi@upi.edu
[3] E-mail: disman@upi.edu
[4] E-mail: imaspurnamasari@upi.edu
[5] E-mail: prisilia.angel2804@gmail.com

A B S T R A C T

Gender in entrepreneurship is an important issue. This research aims to determine the role of gender in the influence of entrepreneurial knowledge on entrepreneurial interest, which is mediated by entrepreneurial attitudes and subjective entrepreneurial norms. The respondents in this research were 156 active Strata-1 students, 115 female students, and 41 male students. The research method used is quantitative with a Structural Equation Modeling (SEM) approach. The main limitation of this research is that it only examines the role of gender in the influence of entrepreneurial knowledge on entrepreneurial interest, which is mediated by entrepreneurial attitudes and subjective entrepreneurial norms. The research findings indicate that gender moderation is more pronounced among females, with females exhibiting a more positive and significant influence on hypotheses five through seven. The results of the hypotheses show that entrepreneurial knowledge does not significantly influence entrepreneurial attitudes. However, the second hypothesis demonstrates a positive and significant relationship between entrepreneurial knowledge and subjective norms of entrepreneurship. Additionally, the third hypothesis highlights the positive impact of entrepreneurial attitudes on entrepreneurial interest. Finally, the fourth hypothesis suggests that entrepreneurial subjective norms significantly influence interest in entrepreneurship.

KEYWORDS: *gender, entrepreneurial knowledge, entrepreneurial interest, entrepreneurial attitudes, subjective norms of entrepreneurship*

Introduction

Entrepreneurship in the last few decades has developed rapidly and has become an interesting topic to be discussed in depth (Allen et al., 2007; Morova et al., 2019; Slavinski et al., 2020). It occupies a significant role and has a positive influence as an important source of wealth, creativity, and job opportunities (Messikh, 2021). Several existing entrepreneurship studies show that entrepreneurship serves as a competitive advantage for developing countries, enabling them to survive and continue to progress in the competitive dynamics of globalization (Nastiti et al., 2010; Levie et al., 2014; Acs et al., 2017; Rahman et al., 2022; Antonijevic et al., 2023).

Research in the field of entrepreneurship is very relevant and promising because entrepreneurship can create new jobs and accelerate national economic development (Leff, 1978; Shane & Venkataraman, 2000; Sanyang & Huang, 2010). Indonesia, as a developing country, also encourages its

citizens, especially the younger generation, to become entrepreneurs by launching the National Entrepreneurship Movement starting in February 2011. The ratio of the number of available jobs, which is not in line with the number of graduates at all levels of education in Indonesia, causes high unemployment rates (Saiman, 2009; Bhasin & Venkataramany, 2010; Amalia & von Korflesch, 2021).

Based on data from the Indonesian Central Statistics Agency (BPS), the open unemployment rate in Indonesia in February 2022 reached 5.83%, a decrease compared to February 2022, which was 5.45%. However, other facts show that the percentage of educated unemployment is increasing every year, especially in high school and vocational school education. Therefore, the government needs to make efforts to encourage the younger generation to open up entrepreneurial employment opportunities (Cole, 2007; Ridha & Wahyu, 2017).

Every year, around 3,355 universities operating in Indonesia produce more than 339,000 undergraduate graduates to enter the labor market (Susetyo & Lestari, 2014). Competition for job positions within organizations is increasing sharply. This condition is one of the main triggers for prospective university graduates to become oriented toward career choices to become entrepreneurs (Schulte, 2004; Iglesias-Sánchez et al., 2016). A number of universities in Indonesia plan entrepreneurship as part of their academic programs by involving certain courses and designing curricula to provide comprehensive entrepreneurship education programs. However, the results of existing studies show that entrepreneurship education in various universities in Indonesia has not been implemented optimally, especially in providing life skills for graduates (Wiratno, 2012; Mulyadi, 2019).

In preparation for entrepreneurship, you must first know the factors that influence interest in entrepreneurship. Interest in entrepreneurship is influenced by various factors, one of which is entrepreneurial knowledge (Wilson et al., 2007; Linan et al., 2011; Hattab, 2014; Firman & Putra, 2020; Saputra et al., 2021). Another factor that influences interest in entrepreneurship is gender (Wilson et al., 2009; Sullivan & Meek, 2012; Wheadon & Duval-Couetil, 2021; Manjaly et al., 2022). Subjective norms also influence entrepreneurial interest (Muliadi et al., 2021; Santoso, 2021). Another factor that influences interest in entrepreneurship is entrepreneurial attitude (Fenech et al., 2019; Aditya, 2020). Therefore, the main aim of this research is to determine the role of gender in the influence of entrepreneurial

knowledge on entrepreneurial interest, which is mediated by entrepreneurial attitudes and subjective entrepreneurial norms.

Theoretical Foundations and Hypothesis Development

This research is based on the research model proposed by Linan et al. (2011), which considers the role of gender as an individual difference that moderates the relationship of several variables in the model, as proposed by Diaz-Garcia and Jimenez-Moreno (2010) and Bae et al. (2014). The existence of previous empirical research showing differences in interest in entrepreneurship between men and women encourages the examination of a model of interest in entrepreneurship that is moderated by gender.

The research model proposed by Linan et al. (2011) has also been tested empirically both by the researcher concerned and by other researchers, as done by Hattab (2014). In their model, Linan et al. (2011) integrate two major theories, The Theory of Entrepreneurial Events/TEE (Shapero & Sokol, 1982) and The Theory of Planned Behavior/TPB (Ajzen, 1991), which is then added with elements of entrepreneurial knowledge that a person obtains through education. The two theories (TEE and TPB) are similar in presenting the factors that explain the formation of entrepreneurial interest.

In the TPB perspective (Ajzen, 1991), interest in entrepreneurship involves three influencing motivational factors, namely 1) perceived behavioral control, which is defined as the perception of the ease or difficulty of carrying out certain behavior, 2) entrepreneurial attitude towards entrepreneurial behavior, namely regarding the positive or negative assessment that a person has regarding this behavior, 3) perceived subjective norms (entrepreneurial subjective norms), which measure the perceived social pressure to carry out entrepreneurial behavior.

Referring to TEE theory (Shapero & Sokol, 1982), interest in entrepreneurship is explained by entrepreneurial desire and perceived feasibility, as well as the tendency to act on existing opportunities. Entrepreneurial passion is defined as an interest in starting a business. Entrepreneurial desire can be understood as a combination of personal attitudes towards entrepreneurial behavior and perceived subjective norms. Perceived feasibility refers to the individual's level of confidence or belief in their capability to accomplish a task, indicating their inclination or readiness

to act on the decisions they make. In the literature in the field of psychology, perceived worthiness is associated with self-efficacy.

By integrating these two theories, Linan et al. (2011) propose that entrepreneurial attitudes and subjective norms combine to shape perceived desirability for entrepreneurship, where the perceived desirability for entrepreneurship is influenced by self-efficacy. Moreover, the amalgamation of these elements contributes to fostering an interest in entrepreneurship, which is further influenced by individuals' entrepreneurial knowledge acquired through education. This study takes into account the significant role of gender in entrepreneurial interest, as supported by various studies (Wilson et al., 2009; Diaz-Garcia & Jimenez-Moreno, 2010; Shinnar et al., 2012; Maes et al., 2014; Bae et al., 2014; Wheadon & Duval-Couetil, 2021). In their research, Diaz-Garcia and Jimenez-Moreno (2010), Shah et al. (2020), and Zhuang et al. (2021) tested the significant moderating role of gender in the influence of entrepreneurial subjective norms and entrepreneurial attitudes on entrepreneurial interest. The moderating role of gender on the influence of entrepreneurial knowledge on entrepreneurial interest was tested in research (Bae et al., 2014; Hassan et al., 2020; Zhao et al., 2021).

Based on the explanation of the theoretical study above, the researcher proposes the following research hypothesis.

H1: Entrepreneurial knowledge has a positive effect on entrepreneurial attitudes.

H2: Entrepreneurial knowledge has a positive effect on entrepreneurial subjective norms

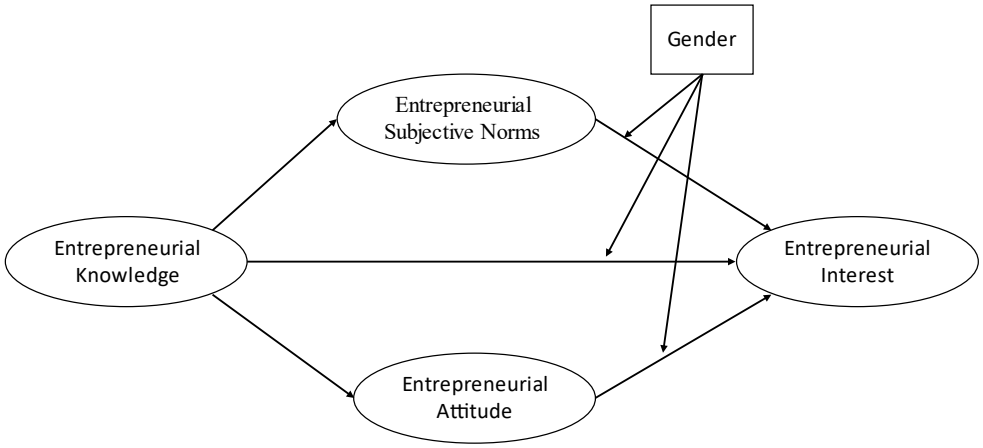
H3: Entrepreneurial attitude has a positive effect on interest in entrepreneurship

H4: Entrepreneurial subjective norms have a positive effect on entrepreneurial interest

H5: Gender moderates the influence of entrepreneurial knowledge on entrepreneurial interest (women are stronger)

H6: Gender moderates the influence of subjective norms of entrepreneurship on entrepreneurial interest (women are stronger)

H7: Gender moderates the influence of entrepreneurial attitudes on entrepreneurial interest (women are stronger).



Source: Authors

Method

This research aims to describe explanatory causality relationships through survey data collection techniques in a cross-sectional time dimension (Cooper et al., 2011: 140; Neuman et al., 2011: 26). The research is cross-sectional because research respondents are observed at a certain time and measurements of the variables are carried out at the time of the research. A purposive sampling technique was used to select a total of 156 active Strata-1 students, comprising 115 female students and 41 male students. Respondents are students from the Faculty of Economics and Business Education at the Indonesian Education University who have passed the Entrepreneurship course. The measurement of research variables includes entrepreneurial knowledge, entrepreneurial attitudes, entrepreneurial subjective norms, and entrepreneurial interest. Statement indicators are assessed using a numerical scale of 1-5. The analysis technique uses the Structural Equation Modeling (SEM) technique.

Findings and Discussion

Research Validation

In the research, validity and reliability tests were conducted to validate the measurement instrument. Confirmatory factor analysis was used to

assess the validity of the measurement instrument, employing AMOS 16. The results of the validity and reliability tests are presented below:

Table 1: Validity and Reliability Test Results

Construct	Indicator	Standardized Loading(λ)	Cronbach's Alpha (α)	Information
Entrepreneurial Knowledge (EK)	EK1	0.736	0.816 (Reliable)	Valid
	EK2	0.594		Valid
	EK3	0.663		Valid
	EK4	0.771		Valid
	EK5	0.728		Valid
Entrepreneurial Attitude (EA)	EA1	0.694	0.826 (Reliable)	Valid
	EA2	0.721		Valid
	EA3	0.728		Valid
	EA4	0.746		Valid
Entrepreneurial Subjective Norms (ESN)	ESN1	0.615	0.892 (Reliable)	Valid
	ESN2	0.725		Valid
	ESN3	0.816		Valid
	ESN4	0.716		Valid
	ESN5	0.846		Valid
	ESN6	0.876		Valid
Entrepreneurial Interest (EI)	EI1	0.732	0.856 (Reliable)	Valid
	EI2	0.795		Valid
	EI3	0.728		Valid
	EI4	0.597		Valid
	EI5	0.734		Valid
	EI6	0.744		Valid

Source: Authors

The minimum factor loading value for each item or indicator that is statistically significant is 0.5 (Hair et al., 2010), indicating good convergent validity. Based on the factor loading values in Table 1, it can be seen that all measurement indicators show good convergent validity.

Next, testing the internal consistency reliability of the measurement instrument is based on Cronbach's Alpha (α) value. A minimum α value of 0.7 for each construct indicates good internal consistency reliability (Hair et al., 2010). The α value of each research construct is in the range of 0.8 so

that the measurement instrument, apart from meeting the validity test, is also declared reliable.

Hypothesis Test

After analyzing the measurement model, where the measurement instrument is declared valid and reliable, the next step is to test the hypothesis by running a structural model. The structural model test in this research was carried out using the maximum likelihood estimation technique. The suitability of the model to the empirical data is measured by the goodness of fit (GOF) index. According to Hair et al. (2010), generally, three to four GOF indices are sufficient to provide evidence regarding the suitability of the model. At a minimum, researchers must report at least one incremental index and one absolute GOF index. The GOF value of the structural model shows Cmin/df = 1.993, GFI=0.786, RMSEA=0.081, CFI=0.841, and IFI=0.843, which is relatively good because it is at marginal fit. Table 2 presents the results of the structural model.

Table 2: Hypothesis test results in the structural model

Relationships Between Constructs	Standardized Estimated Value	Critical Ratio	P-value	Information
EK→EA	0.102	1.033	0.207	H1 not supported
EK→ESN	0.349	3.497	***	H2 supported
EA→EI	0.360	3.092	0.002	H3 supported
ESN→EI	0.659	6.018	***	H4 supported

***Significant coefficient on P-value < 0.001
Source: Authors

Table 3: Hypothesis test results in the structural model with gender moderation

Structural Relationships Between Constructs	Standardized Estimated Value		$\Delta\chi^2$	Δdf	P-value	Information
	Man	Woman				
EK→EI	-0.222	0.518**	15.346	9	0.083	H5 supported
ESN→ EI	0.215	0.732**	22.733	10	0.022	H6 supported
EA→ EI	0.236*	0.665**	12.657	10	0.263	H7 not supported

** Significant coefficient on P-value < 0.001
* Significant coefficient on P-value < 0.1
Source: Authors

Discussion

Referring to the hypothesis test results shown in Table 2 and Table 3, there are two hypotheses that were not supported (H1 and H7) out of the seven hypotheses tested. Research data shows that entrepreneurial knowledge has no effect on entrepreneurial attitudes (H1). This is in line with entrepreneurial knowledge not being a factor that influences a person's entrepreneurial attitude (Scuotto & Morellato, 2013; Kourilsky & Walstad, 1998) and contradicts the findings of Wijayati et al. (2021) and Packham et al. (2010) where entrepreneurial knowledge has a positive effect on entrepreneurial attitudes.

The second hypothesis is that entrepreneurial knowledge has a positive effect on subjective norms of entrepreneurship. The results of this second hypothesis are not in line with the findings of several researchers, Awang et al. (2016) and Santos and Liguori (2020), where subjective entrepreneurship acts as a moderator variable. The third hypothesis is that it is known that entrepreneurial attitudes have a positive effect on interest in entrepreneurship, so it is in accordance with the findings of research conducted (Schwarz et al., 2009; Chen & Lai, 2010; Jena, 2010). The fourth hypothesis shows that entrepreneurial subjective norms have a positive effect on entrepreneurial interest. This is supported by research conducted (by Wazni et al., 2023, and Utami, 2017) and contradicts the findings of Fenech et al. (2019), where subjective entrepreneurial norms do not significantly influence entrepreneurial interest.

Even though entrepreneurial knowledge has no influence on attitudes, it appears that entrepreneurial attitudes have a positive influence on entrepreneurial interest. In simple terms, entrepreneurial attitudes encourage interest in entrepreneurship, but entrepreneurial attitudes are not generated by the influence of entrepreneurial knowledge obtained through education, but rather by other factors. Research data also shows the significant moderating role of gender on the direct influence of entrepreneurial knowledge on entrepreneurial interest. (H5), where the positive and meaningful influence is felt more strongly by female respondents and women who receive greater benefits (Nowiński et al., 2019). Gender significantly moderates the influence of entrepreneurial subjective norms on entrepreneurial interest (H6), which can be seen from Table 3; the meaningful and strong positive influence is felt more by female students and is supported by the findings of Bagheri and Lope Pihie (2014), where the

gender role of women is stronger in the influence of subjective norms of entrepreneurship on entrepreneurial interest. Furthermore, female gender moderates the influence of entrepreneurial attitudes on interest in entrepreneurship and is supported by the findings of Bagheri and Lope Pihie (2014) who state that women have a large role in the influence of entrepreneurial attitudes on interest in entrepreneurship.

Conclusion

The conclusions obtained from the results of this study show that the moderating role of gender is more evident in the female gender, where the female gender is more positive and has a greater influence on hypotheses five to the seventh hypothesis. The results of other hypotheses show that entrepreneurial knowledge does not significantly influence entrepreneurial attitudes. The second hypothesis indicates that entrepreneurial knowledge has a positive and significant impact on subjective norms related to entrepreneurship. The third hypothesis illustrates the positive influence of entrepreneurial attitudes on entrepreneurial interest. Finally, the subsequent hypothesis demonstrates that entrepreneurial subjective norms significantly influence interest in entrepreneurship. Based on the results of this research, we can see the factors that have a significant influence as well as those that have less impact within the boundaries of the tested research variables. Therefore, in the future, this research can be used as a basis for similar research with different variables. The implications of this research can be used for universities or parties with an interest in entrepreneurship, particularly in addressing the gender disparity observed in entrepreneurial participation.

References

[1] **Acs, Z. J., Szerb, L., & Lloyd, A.** (2017). *Global entrepreneurship and development index 201* (Vol. 49, No. 1, pp. 1-10). Springer International Publishing.

[2] **Aditya, S.** (2020). The Influence of Attitude, Subjective Norms, Perception of Self-Control And Entrepreneurship Education on Entrepreneurial Intentions. *Journal of Business and Behavioural Entrepreneurship*, *4*(2), 66-83.

[3] **Ajzen, I.** (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, *50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

[4] **Amalia, R. T., & von Korflesch, H. F.** (2021). Entrepreneurship education in Indonesian higher education: mapping literature from the Country's perspective. *Entrepreneurship Education*, *4*, 291-333. https://doi.org/10.1007/s41959-021-00053-9

[5] **Allen, I. E., Langowitz, N., & Minniti, M.** (2007). Global entrepreneurship monitor. *2006 report on women and entrepreneurship*, *3*(1), 54-88.

[6] **Antonijević, M., Ljumović, I., & Ivanović, Đ.** (2022). Is there a Gender Gap in Financial Inclusion Worldwide?. *Journal of Women's Entrepreneurship and Education*, (1-2), 79-96.

[7] **Awang, A., Amran, S., Nor, M. N. M., Ibrahim, I. I., & Razali, M. F. M.** (2016). Individual entrepreneurial orientation impact on entrepreneurial intention: Intervening effect of PBC and subjective norm. *Journal of Entrepreneurship, Business and Economics*, *4*(2), 94-129.

[8] **Badan Pusat Statistik Indoensia.** (2014). Keadaan ketenagakerjaan Februari 2023. Berita Resmi Statistik, 38: 1-5. https://www.bps.go.id/subject/6/tenaga-kerja.html#subjekViewTab3

[9] **Bagheri, A., & Lope Pihie, Z. A.** (2014). The moderating role of gender in shaping entrepreneurial intentions: Implications for vocational guidance. *International Journal for Educational and Vocational Guidance*, *14*, 255-273. DOI 10.1007/s10775-014-9269-z

[10] **Bae, T. J., Qian, S., Miao, C., & Fiet, J. O.** (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta–analytic review. *Entrepreneurship theory and practice*, *38*(2), 217-254. https://doi.org/10.1111/etap.12095

[11] **Bhasin, B. B., & Venkataramany, S.** (2010). Globalization of entrepreneurship: Policy considerations for SME development in Indonesia. *International Business & Economics Research Journal (IBER)*, *9*(4). https://doi.org/10.19030/iber.v9i4.557

[12] **Chen, Y. F., & Lai, M. C.** (2010). Factors influencing the entrepreneurial attitude of Taiwanese tertiary-level business students. *Social Behavior and Personality: an international journal*, *38*(1), 1-12. https://doi.org/10.2224/sbp.2010.38.1.1

[13] **Cole, S.** (2007). Entrepreneurship and empowerment: Considering the barriers-a case study from Indonesia. *Tourism: An International Interdisciplinary Journal*, *55*(4), 461-473. https://hrcak.srce.hr/24675

[14] **Cooper, D. R., Schindler, P. S., Cooper, D. R., & Schindler, P. S.** (2003). Business research methods. http://sutlib2.sut.ac.th/sut_contents/H139963.pdf

[15] **Díaz-García, M. C., & Jiménez-Moreno, J.** (2010). Entrepreneurial intention: the role of gender. *International entrepreneurship and management journal*, *6*, 261-283. DOI 10.1007/s11365-008-0103-2

[16] **Fenech, R., Baguant, P., & Ivanov, D.** (2019). Entrepreneurial attitudes, self-efficacy, and subjective norms amongst female Emirati entrepreneurs. *International Journal of entrepreneurship*, *23*(1), 1-11.

[17] **Firman, A., & Putra, A. H. P. K.** (2020). The Effect of Social Media Utilization, Campus Environment and Entrepreneurship Knowledge on Student Entrepreneurial Interest. *Point Of View Research Management*, *1*(4), 131-143. http://www.journal.accountingpointofview.id/index.php/POVREMA/article/view/101

[18] **Hattab, H. W.** (2014). Impact of entrepreneurship education on entrepreneurial intentions of university students in Egypt. *the Journal of Entrepreneurship*, *23*(1), 1-18. https://doi.org/10.1177/0971355713513346

[19] **Hassan, A., Saleem, I., Anwar, I., & Hussain, S. A.** (2020). Entrepreneurial intention of Indian university students: the role of opportunity recognition and entrepreneurship education. *Education+ Training*, *62*(7/8), 843-861. https://doi.org/10.1108/ET-02-2020-0033

[20] **Iglesias-Sánchez, P. P., Jambrino-Maldonado, C., Velasco, A. P., & Kokash, H.** (2016). Impact of entrepreneurship programmes on university students. *Education+ Training*, *58*(2), 209-228. https://doi.org/10.1108/ET-01-2015-0004

[21] **Jena, R. K.** (2020). Measuring the impact of business management Student's attitude towards entrepreneurship education on entrepreneurial intention: A case study. *Computers in Human Behavior*, *107*, 106275. https://doi.org/10.1016/j.chb.2020.106275

[22] **Kourilsky, M. L., & Walstad, W. B.** (1998). Entrepreneurship and female youth: Knowledge, attitudes, gender differences, and educational practices. *Journal of Business venturing*, *13*(1), 77-88. https://doi.org/10.1016/S0883-9026(97)00032-3

[23] **Leff, N. H.** (1978). Industrial organization and entrepreneurship in the developing countries: The economic groups. *Economic development and cultural change*, *26*(4), 661-675. https://www.journals.uchicago.edu/doi/abs/10.1086/451052

[24] **Levie, J., Autio, E., Acs, Z., & Hart, M.** (2014). Global entrepreneurship and institutions: an introduction. *Small business economics*, *42*, 437-444. https://doi.org/10.1007/s11187-013-9516-6

[25] **Liñán, F., Rodríguez-Cohard, J. C., & Rueda-Cantuche, J. M.** (2011). Factors affecting entrepreneurial intention levels: a role for education. *International entrepreneurship and management Journal*, *7*, 195-218. https://doi.org/10.1007/s11365-010-0154-z

[26] **Maes, J., Leroy, H., & Sels, L.** (2014). Gender differences in entrepreneurial intentions: A TPB multi-group analysis at factor and indicator level. *European Management Journal*, *32*(5), 784-794. https://doi.org/10.1016/j.emj.2014.01.001

[27] **Manjaly, N. B., Joseph, G., Nimmi, P. M., & KS, K. N.** (2022). Entrepreneurial Intention of Indian Women University Students. *Journal of Women's Entrepreneurship and Education*, (3-4), 273-290.

[28] **Messikh, A.** (2021). The Entrepreneurial Intention of Algerian Women (a Sample Study of Skikda University Female Students). *Journal of Women's Entrepreneurship and Education*, (3-4), 134-150.

[29] **Morozova, I. A., Popkova, E. G., & Litvinova, T. N.** (2019). Sustainable development of global entrepreneurship: infrastructure and perspectives. *International Entrepreneurship and Management Journal*, *15*, 589-597. https://doi.org/10.1007/s11365-018-0522-7

[30] **Muliadi, A., Mirawati, B., & Prayogi, S.** (2021). The Effect Entrepreneurship Education and Subjective Norm on Biology Students' Self-Efficacy in Entrepreneurial. *Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, *9*(1), 127-135. https://doi.org/10.33394/j-ps.v9i1.3981

[31] **Mulyadi, D., Rosyidi, U., & Suryadi, S.** (2019). Life skills education programs; the bridge to the employment of the poors. *International Journal for Educational and Vocational Studies*, *1*(5), 434-439. https://doi.org/10.29103/ijevs.v1i5.1503

[32] **Nastiti, T., Indarti, N., & Rostiani, R.** (2010). Minat berwirausaha mahasiswa Indonesia dan Cina. *Manajemen dan Bisnis*, *9*(2).

[33] **Neuman, W. L., Nardi, P. M., Berg, B. L., Jackson, W., Varberg, N., Robson, K., ... & Turner, L. A.** (2011). *Research Methods in Communication*. Pearson, London, UK.

[34] **Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D., & Czeglédi, C.** (2019). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, *44*(2), 361-379. https://doi.org/10.1080/03075079.2017.1365359

[35] **Packham, G., Jones, P., Miller, C., Pickernell, D., & Thomas, B.** (2010). Attitudes towards entrepreneurship education: a comparative analysis. Education+ training, *52*(8/9), 568-586. https://doi.org/10.1108/00400911011088926

[36] **Rahman, M. M., Salamzadeh, A., & Tabash, M. I.** (2022). Antecedents of entrepreneurial intentions of female undergraduate students in Bangladesh: a covariance-based structural equation modeling approach. *Journal of Women's Entrepreneurship and Education*, (1-2), 137-153.

[37] **Ridha, R. N., & Wahyu, B. P.** (2017). Entrepreneurship intention in agricultural sector of young generation in Indonesia. *Asia pacific journal of innovation and entrepreneurship*, *11*(1), 76-89. https://doi.org/10.1108/APJIE-04-2017-022

[38] **Santos, S. C., & Liguori, E. W.** (2020). Entrepreneurial self-efficacy and intentions: Outcome expectations as mediator and subjective norms as moderator. *International Journal of Entrepreneurial Behavior & Research*, *26*(3), 400-415. https://doi.org/10.1108/IJEBR-07-2019-0436

[39] **Santoso, S.** (2021). Relationship between Social Media, Organizational Support, Subjective Norms and Perceived Behavioral Control to Form Entrepreneurial Intention. *Expert Journal of Business and Management*, *9*(1).

[40] **Sanyang, S. E., & Huang, W. C.** (2010). Entrepreneurship and economic development: The EMPRETEC showcase. *International Entrepreneurship and Management Journal*, *6*, 317-329. https://doi.org/10.1007/s11365-008-0106-z

[41] **Saputra, A. D., Rahmatia, A., & Muslimah, M.** (2021). How personal factors grow students' interest in entrepreneurship. *Jurnal Manajemen Dan Pemasaran Jasa*, *14*(1), 61-76. https://doi.org/10.25105/jmpj.v14i1.8336

[42] **Saiman, L.** (2009). Kewirausahaan: teori, praktik, dan kasus-kasus. *Jakarta: Salemba Empat*.

[43] **Schulte, P.** (2004). The entrepreneurial university: a strategy for institutional development. *Higher education in Europe*, *29*(2), 187-191. https://doi.org/10.1080/0379772042000234811

[44] **Schwarz, E. J., Wdowiak, M. A., Almer-Jarz, D. A., & Breitenecker, R. J.** (2009). The effects of attitudes and perceived environment conditions on students' entrepreneurial intent: An Austrian perspective. *Education+ Training*, *51*(4), 272-291. https://doi.org/10.1108/00400910910964566

[45] **Scuotto, V., & Morellato, M.** (2013). Entrepreneurial knowledge and digital competence: Keys for a success of student entrepreneurship. *Journal of the Knowledge Economy*, *4*, 293-303. https://doi.org/10.1007/s13132-013-0155-6

[46] **Shah, I. A., Amjed, S., & Jaboob, S.** (2020). The moderating role of entrepreneurship education in shaping entrepreneurial intentions. *Journal of Economic Structures*, *9*, 1-15. https://doi.org/10.1186/s40008-020-00195-4

[47] **Shane, S., & Venkataraman, S.** (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, *25*(1), 217-226. https://doi.org/10.5465/amr.2000.2791611

[48] **Shapero, A., & Sokol, L.** (1982). The social dimensions of entrepreneurship. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. https://ssrn.com/abstract=1497759*

[49] **Shinnar, R. S., Giacomin, O., & Janssen, F.** (2012). Entrepreneurial perceptions and intentions: The role of gender and culture. *Entrepreneurship Theory and practice*, *36*(3), 465-493. https://doi.org/10.1111/j.1540-6520.2012.00509.x

[50] **Slavinski, T., Todorović, M., Vukmirović, V., & Montenegro, A. M.** (2020). Women, entrepreneurship and education: Descriptive bibliometric analysis based on scopus database. *Journal of Women's Entrepreneurship and Education*, (3-4), 181-201.

[51] **Sullivan, D. M., & Meek, W. R.** (2012). Gender and entrepreneurship: a review and process model. *Journal of managerial psychology*, *27*(5), 428-458. https://doi.org/10.1108/02683941211235373

[52] **Susetyo, D., & Lestari, P. S.** (2014). Developing entrepreneurial intention model of university students: an empirical study on university students in Semarang Indonesia. *International Journal of Engineering and Management Sciences*, *5*(3), 184-196.

[53] **Utami, C. W.** (2017). Attitude, subjective norm, perceived behaviour, entrepreneurship education and self efficacy toward entrepreneurial intention university student in Indonesia. http://dspace.uc.ac.id/handle/123456789/1020

[54] **Wazni, M. K., Muliadi, A., Marhamah, M., & Sarwati, S.** (2023). Effects of Entrepreneurship Learning and Subjective Norms on Biology Students' Entrepreneurial Attitudes and Interests. *Jurnal Penelitian Pendidikan IPA*, *9*(2), 780-787. https://doi.org/10.29303/jppipa.v9i2.2989

[55] **Wijayati, D. T., Fazlurrahman, H., Hadi, H. K., & Arifah, I. D. C.** (2021). The effect of entrepreneurship education on entrepreneurial intention through planned behavioural control, subjective norm, and entrepreneurial attitude. *Journal of Global Entrepreneurship Research*, 1-14. https://doi.org/10.1007/s40497-021-00298-7

[56] **Wilson, F., Kickul, J., & Marlino, D.** (2007). Gender, entrepreneurial self–efficacy, and entrepreneurial career intentions: Implications for entrepreneurship education. *Entrepreneurship theory and practice*, *31*(3), 387-406. https://doi.org/10.1111/j.1540-6520.2007.00179.x

[57] **Wilson, F., Kickul, J., Marlino, D., Barbosa, S. D., & Griffiths, M. D.** (2009). An analysis of the role of gender and self-efficacy in developing female entrepreneurial interest and behavior. *Journal of developmental Entrepreneurship*, *14*(02), 105-119. https://doi.org/10.1142/S1084946709001247

[58] **Wheadon, M., & Duval-Couetil, N.** (2021). Token entrepreneurs: A review of gender, capital, and context in technology entrepreneurship. *Understanding Women's Entrepreneurship in a Gendered Context*, 142-170.

[59] **Wiratno, S.** (2012). Pelaksanaan pendidikan kewirausahaan di pendidikan tinggi. *Jurnal Pendidikan dan Kebudayaan*, *18*(4), 454-466.

[60] **Zhao, H., O'Connor, G., Wu, J., & Lumpkin, G. T.** (2021). Age and entrepreneurial career success: A review and a meta-analysis. *Journal of Business Venturing*, *36*(1), 106007. https://doi.org/10.1016/j.jbusvent.2020.106007

[61] **Zhuang, X., Hou, X., Feng, Z., Lin, Z., & Li, J.** (2021). Subjective norms, attitudes, and intentions of AR technology use in tourism experience: The moderating effect of millennials. *Leisure Studies*, *40*(3), 392-406. https://doi.org/10.1080/02614367.2020.1843692

Article history: Received: September 11th, 2023

Accepted: March 19th, 2024

DOI: 10.28934/jwee24.12.pp157-176
JEL: L23, L25

ORIGINAL SCIENTIFIC PAPER

Digitalisation, Growth Vision and Gender Equality Practices in the Machines and Equipment Sector – Does Gender Matter?

Lazar Živković [1]
Dijana Štrbac [2]
Mihailo Paunović [3]
Institute of Economic Sciences, Department of Innovation Economics,
Belgrade, Serbia

A B S T R A C T

This paper explores the nuanced relationship between gender diversity in senior management and key aspects of organizational dynamics in the machines and equipment sector in the Republic of Serbia. The aim is to uncover differences in digitalization, growth strategies and gender equality measures between companies led by women and men. Employing field research methods, specifically utilizing Computer Assisted Telephone Interviewing, the results show that companies led by women have a higher propensity to adopt information and communication technologies, a more optimistic view of their future development over the next five years, greater gender diversity among employees and more robust implementation of gender equality policies compared to companies led exclusively by men. The research findings highlight the significant impact of gender diversity in leadership on business outcomes and show that women-led companies are proactively embracing digitalization, promoting growth optimism and implementing gender equality initiatives. These findings offer valuable insights

[1] Corresponding auhor, e-mail: lazar.zivkovic@ien.bg.ac.rs
[2] E-mail: dijana.strbac@ien.bg.ac.rs
[3] E-mail: mihailo.paunovic@ien.bg.ac.rs

for business leaders, policymakers and researchers working on initiatives to promote diversity, equality, and technological progress.

KEYWORDS: *women in leadership, women entrepreneurship, machines and equipment sector, ICT adoption, growth strategies, Serbia*

Introduction

The unequal engagement of men and women in entrepreneurship is a subject of significant concern for researchers and policymakers in both developed and developing nations. There are three primary lines of research that shed light on the differences in entrepreneurial outcomes between men and women: personality and traits, gender beliefs and ascriptions, and contextual factors (Rietveld & Patel, 2022). The relative significance of these factors may vary across individuals, industries, and regions. Additionally, the interplay and combination of these factors likely influence entrepreneurial outcomes in a nuanced way.

The disparity between genders is more pronounced in established businesses compared to early-stage activities. Data from the Global Entrepreneurship Monitor (2023) reveal that the global established rate for women in 2022 is 5.5%, while for men, it is 8.1%. These data underscore the challenges women face in advancing to and sustaining businesses at later stages. This report points to positive developments in women's entrepreneurial activities in certain regions, characterized by an increase in early-stage entrepreneurial activities and a narrowing of the gender gap. Despite these positive trends, the overarching conclusion emphasizes the need for significant efforts to promote and support women entrepreneurs. Challenging stereotypes and broadening societal perspectives are cited as crucial steps to promote a more inclusive vision of entrepreneurship.

Entrepreneurship is not only an economic and social activity but is also widely recognized as a "gendered process" (Nguyen, Lin & Vu, 2023; Marlow, 2019). This means that the experiences, opportunities, and challenges that individuals face in entrepreneurship are often influenced by their gender. Furthermore, the priorities and decision-making processes often differ considering the gender structure of a company's owners and managers (Marlow, 2019). This intricate interplay between entrepreneurship and gender dynamics forms the backdrop for our research, which specifically examines the impact of gender diversity in senior management

on digitalization, growth vision, and gender equality practices in the machines and equipment sector. We aim to contribute not only to the broader understanding of gendered processes in entrepreneurship but also to the strategic considerations that companies need to make in order to leverage the diverse perspectives and strengths that bring women in leadership positions to the forefront of technological and organizational progress.

In modern times, many nations have taken legislative measures to ensure equal representation of women on company boards. Spain was one of the pioneers in introducing legal provisions requiring the inclusion of women on corporate boards (Reguera et al., 2017), followed by India (Kamath, 2022), which introduced similar practices. Despite legislation mandating a fixed quota of female board members in companies, compliance with these guidelines appears to be gradually gaining ground, albeit at a moderate pace (Kamath, 2022).

The intersection of gender dynamics with digitalization and visions of growth is a compelling area of study, as it not only reflects the evolving nature of the sector, but also highlights the need for inclusive and equitable practices. Despite progress towards gender equality in various domains, disparities persist, raising critical questions about the impact on innovation, organizational culture, and overall sectoral advancement.

Gender diversity and inclusive leadership are recognized as factors that foster innovation and facilitate successful digital transformation efforts within organizations. Gender diversity in top management teams has a positive impact on innovation and, thus, on the overall performance of the company (Lee & Chung, 2022; del Mar Fuentes-Fuentes et al., 2023; Capozza & Divella, 2023). Organizations with greater gender diversity tend to exhibit higher levels of innovation, including generating new ideas, developing innovative products and services, and implementing creative solutions to complex problems. In addition to gender diversity, the presence of inclusive leadership practises is particularly important for creating a supportive work environment. This includes open communication, encouraging collaboration and valuing different opinions within the organization.

There is a dynamic relationship between digital transformation and gender equality. On the one hand, digitalization is a powerful tool to influence gender diversity; on the other hand, gender diversity has numerous positive effects on digital transformation. Gender diversity brings different

perspectives, creativity, innovation and inclusion to organizations. Empirical research has shown that in countries with a high proportion of women in middle and senior management positions, the integration of digital technologies in organizations tends to be higher, and more demanding ICT tasks are performed by women in the workplace (Onozaka & Nemoto, 2023).

In an era characterized by rapid technological advances and unprecedented digitalization, industries are forced to adapt quickly in order to remain competitive and secure their growth. As a cornerstone of global economic development, the machines and equipment sector is at the forefront of this wave of transformation. This sector includes nine divisions of the manufacturing industry (as indicated in the "Data and Methods" section), which is considered the backbone of economic growth in national economies. Manufacturing plays a crucial role in the economy due to its extensive linkages with other sectors of the economy through the value chain. Compared to other sectors, manufacturing offers the best conditions for capital accumulation, technological innovation and economies of scale. In addition, manufacturing offers favorable conditions for capital accumulation, economies of scale, technological innovation and digital transformation.

Future machines and manufacturing systems are identified as one of the priority areas in the Smart Specialisation Strategy of the Republic of Serbia. More specifically, the following sub-priorities are supported: General and special-purpose machines, Information for smart management: Industry 4.0, Smart components and tools (Smart specialization strategy of the Republic of Serbia for the period 2020 to 2027, 2020). Although there are ongoing efforts to promote gender equality in various industries, the machines and equipment sector represents a unique landscape where traditional gender imbalances persist. As companies in this sector leverage digital technologies to increase efficiency and innovation, it is imperative to critically examine the intersection of growth visions and gender equality practices within their organizational framework.

The main objective of this paper is to investigate potential disparities in digitalization, growth strategies, and gender equality measures between companies led by women and men in the machines and equipment sector within the Republic of Serbia. In this research, the term "digitalization" encompasses a wide range of technological progress and adjustments that companies are making to adapt to the digital era. To measure the extent of

adoption of information and communication technologies (ICT), businesses were surveyed about their utilization of particular technologies such as Cloud service, Enterprise Resource Planning software, Customer Relationship Management software, or the Internet of Things. Specifically, the study aims to ascertain whether discernible differences exist between companies led by women and those led by men in these critical dimensions.

Following the main objective, three research questions (RQ) are formulated:

RQ1: Are there any differences in ICT adoption between companies led by women and those led by men?

RQ2: Are there any differences in growth vision between companies led by women and those led by men?

RQ3: Are there any differences in gender equality practices between companies led by women and those led by men?

In accordance with the main objective of the study and the three research questions, the companies surveyed are divided into two groups depending on whether they have women in senior management positions. Subsequently, the non-parametric Mann-Whitney test is used to determine whether there are differences between companies led by women and those led by men in terms of the use of ICT, growth vision and gender equality practices.

This research contributes to a better understanding of the current landscape and informs potential interventions or policies that can promote inclusivity and equitable opportunities for both women and men in leadership roles within the machines and equipment industry in Serbia.

The structure of the paper is as follows. The next section provides an overview of the literature on digitalization, growth strategies and gender equality measures from the perspective of gender differences. A further section describes the materials and methods, including the data used for the statistical analysis. The third section presents the most important results and findings of the statistical analysis. The final section summarises the main conclusions.

Literature Review

A systematic literature review conducted by Cardella, Hernandez-Sanchez and Sanchez-Garcia (2020) highlights the increasing trend in research studies on women's entrepreneurship, which began in 2006 and peaked in 2019. Six distinct research themes were recognized, highlighting the significance of entrepreneurial education, social entrepreneurship, and socio-cultural elements like culture, family, and institutional support as instruments to tackle the gender gap. Furthermore, it emphasizes the pivotal role of women's entrepreneurship in fostering economic growth, particularly in developing nations, fostering social inclusion, and combating poverty and discrimination.

Recognizing ICT as a catalyst for empowering female entrepreneurship is in line with global perspectives, as underscored by the United Nations Conference on Trade and Development (UNCTAD, 2014). UNCTAD emphasizes the central role of ICT in job creation, economic growth, poverty reduction and gender equality. In emerging economies, the use of ICT has transformative potential to reshape the social, political and economic landscape for women. Ajumobi and Kyobe (2016) argue that ICTs in such contexts can promote growth opportunities, contribute to development and address socioeconomic inequalities.

Crittenden, Crittenden and Ajjan (2019) looked at the decision-making processes of women entrepreneurs in relation to ICT adoption. This study emphasizes the importance of their reflections on the perceived ease of ICT use and associated benefits. Significantly, the study revealed a robust and direct relationship between ICT use, self-efficacy and the formation of bonding social capital, shedding light on the multifaceted impact of technology on entrepreneurial endeavors. In addition, recent research focussing on small and medium-sized enterprises (SMEs) has revealed significant differences in the perspectives of women and men-led businesses on digital transformation. Women-led businesses showed a greater commitment to social networking platforms and a higher proportion of employees with ICT skills than their male-led counterparts. These findings suggest that women in leadership positions in SMEs tend to use social networks more intensively and employ more ICT professionals, highlighting the nuanced dynamics of digital adoption and utilization across gender boundaries (Alam, Erdiaw-Kwasie & Wiesner, 2022). Findings by Shamaki, Ibrahim, and Philemon (2022) suggest that while digitalization awareness

alone does not significantly impact business performance, the adoption and adaptation of new technologies play a critical role in creating value and enhancing customer satisfaction. This underscores the necessity for businesses, particularly those led by women, to actively engage with evolving digital landscapes to remain competitive and responsive to market demands. While these studies provide valuable insights, they may not fully capture the complexity of gender dynamics in specific industries, which points to a gap in the literature that our research aims to fill.

Building on the interplay between gender dynamics, digitalization and growth strategies, the literature on gender entrepreneurship highlights the particular contributions of female leaders to sustainable investment and environmental protection (Atif, Alam & Hossain, 2020). Women entrepreneurs show a strong commitment to incorporating green practices into their businesses, driven by unique motivations. Most notably, women demonstrate a proactive approach to seeking green networks, connecting with like-minded businesses, accessing a broader customer base, and utilizing alternative resources, all of which contribute to the expansion of their green business networks (Braun, 2010). Complementing this, an empirical study by Nguyen, Lin and Vu (2023) looks at the motives for environmentally conscious practices in women-led businesses. This study distinguishes between intrinsic motivation and extrinsic pressure and shows that women-led firms tend to adopt environmentally friendly practices for both intrinsic and extrinsic reasons, which emphasizes the multifaceted nature of their environmental commitment. Moreover, a study focusing on women entrepreneurs in Serbia (Chroneos Krasavac, Karamata & Đorđević, 2019) emphasizes the importance of complementing the environmental dimensions with economic and social components in business activities in order to fully exploit their potential impact. This intuitive inclination towards environmental aspects is in line with the broader discussion on gendered processes in entrepreneurship and emphasizes the need for a holistic approach. However, it's crucial to critically assess the applicability of these findings to other contexts and industries, particularly within the machines and equipment sector in Serbia. In Serbia, where the traditional gender imbalance in the machines and equipment sector persists, understanding and promoting such multi-faceted approaches is crucial for women entrepreneurs to make a meaningful contribution to the national economy.

Numerous studies have endeavored to investigate the relationship between gender and a company's commitment to exports. Marques (2015) found that the gender of top managers and owners exerts an indirect influence on a company's exports through factors such as the company's productivity, access to finance, choice of sector and the voluntary decision to export. When these factors are taken into account, the sole gender effect diminishes, suggesting that the impact on export decisions is not solely due to being a woman, but rather to the ownership and sector characteristics of women-owned or managed firms. Similarly, the study by Garg and Shastri (2022) provides insights into the export behavior of companies with a majority of female owners. In contrast to Marques, their findings suggest that such companies are less inclined to export. However, when these companies decide to export, the gender of the owner has no significant influence on the choice of export type or export intensity. This nuanced view sheds light on the complicated interplay between gender, ownership and export decisions and highlights the need for a comprehensive understanding of factors beyond gender to explain export behavior.

Sabarwal and Terrell (2005) have shown that female entrepreneurs achieve profit margins per unit of turnover that are equal to those of their male colleagues. However, women entrepreneurs tend to operate small businesses due to capital constraints and a concentration in industries dominated by small firms. This suggests that women's returns to scale are notably higher than men's, implying potential benefits from scaling up their enterprises. Subsequently, Christiansen et al. (2016) investigated the correlation between gender diversity in leadership roles and firm performance. The study revealed a positive relationship, emphasizing that a greater representation of women in decision-making positions is associated with enhanced financial performance. This positive correlation is particularly pronounced in service sectors, where women constitute a larger workforce, and in manufacturing, where there is a high demand for complementary skills and critical thinking. Conversely, in retail and construction, there is no statistically significant difference in the financial performance of companies based on the proportion of women in management positions. Nevertheless, it is crucial to acknowledge that the causative link between gender diversity and firm performance is not conclusively established, warranting further research to comprehend the underlying mechanisms.

Given the sector-specific nuances in the relationship between gender diversity and firm performance, it becomes evident that a one-size-fits-all approach may not be appropriate. Instead, targeted research in specific industries can provide deeper insights into the dynamics at play. In this context, the machines and equipment sector stands out as a compelling area for analysis due to its technological complexity, innovation-driven nature and historical gender imbalance in leadership positions.

Previous studies concerning gender inequality in the machines and equipment sector have largely been ignored. Recent research on women's entrepreneurship in Serbia has focussed on assessing their potential for further development, identifying the main obstacles and motives and determining their contribution to the national economy. In a study by Pavlović et al. (2022) in the tourism industry, the results emphasize the crucial role of education, training and financial support for women in starting their businesses. Financial support is cited as a decisive factor in maintaining businesses in the tourism sector. Milojević et al. (2021) examined women's entrepreneurship in organic food production in Serbia and highlighted promising opportunities, despite challenges such as economic stagnation, indebtedness to foreign investors and the impact of the global Covid-19 pandemic on the sector. The study notes that the impact of automation and digitalization on organic food production and women's participation is uncertain and emphasizes the need for greater and transparent incentives to promote women's employment. It also calls for the development of expertise and management skills, especially for work in small family farms and potentially larger businesses. Another study by Jovanović and Lazić (2018) shows that there are still obstacles for female entrepreneurs in Serbia, especially difficulties in accessing information about potential markets, technologies and sources of financing. Despite the obvious potential for female entrepreneurship in the country, these challenges highlight the need for targeted support and interventions to close information gaps and facilitate women's entrepreneurial endeavors.

Although the aforementioned studies offer valuable insights, there are notable gaps in the current research landscape. While there are numerous studies on women's entrepreneurship in Serbia in general, as well as in sectors such as tourism and organic food production, there is a lack of studies specifically focusing on the machines and equipment sector. This sector represents a significant segment of the economy and offers unique challenges and opportunities for women entrepreneurs. Therefore, our study

aims to fill this gap by examining potential differences in digitalization, growth strategies and gender equality policies in the machines and equipment sector in the Republic of Serbia. By filling these gaps, our study aims to contribute to a more nuanced understanding of gender dynamics in entrepreneurship and support policy measures to promote inclusion and equal opportunities for women in leadership positions.

Data and Methods

Our research employed a field research method, specifically utilizing Computer Assisted Telephone Interviewing (CATI), to survey companies within the Republic of Serbia operating in the machines and equipment sector. Block and Erskine (2012) point out that telephone interviews have distinct advantages, such as the flexibility and access that researchers do not have with traditional methods, and that many of the challenges of telephone interviews are simply the result of a natural trade-off that exists with all research methods. The main advantage of CATI is that the data is entered directly into the survey database in a structured format, so that no additional data processing is required, and the survey process is, therefore, faster.

The population for the sample selection was formed on the basis of the Statistical Business Register of the Republic of Serbia. It includes all active companies that have submitted the financial report for the year 2020 and whose main activity corresponds to the equipment and machines sector. The broader definition of the equipment and machines sector includes the following economic activities according to the Statistical Classification of Economic Activities in the European Community (NACE Rev. 2): rubber and plastic products (22), fabricated metal products (25), computer, electronic and optical products (26), electrical equipment (27), machinery and equipment (28), motor vehicles, trailers and semi-trailers (29), other transport equipment (30) and repair and installation of machinery and equipment (33) (Eurostat, 2008). Enterprises with fewer than 5 or more than 500 employees were excluded from the population. The decision to exclude companies with fewer than 5 employees is due to their simplified management structures, which could provide meaningful insights into the interplay of gender dynamics, digitalization and growth strategies. Conversely, the exclusion of companies with more than 500 employees reflects the assumption that larger organizations are better placed to implement comprehensive gender management strategies. Given their

extensive resources and established operational frameworks, it can be assumed that they are more advanced in addressing gender issues than smaller organizations. The population thus defined consisted of 2,850 enterprises.

Stratified random sampling was chosen as the sampling method, as it enables a more accurate representation of the population. This method requires a smaller sample size, which saves resources and time. It ensures that each subgroup of the population is adequately represented in the sample. Consequently, stratified random sampling provides better coverage of the population as it allows control over the subgroups and ensures that all subgroups are represented in the sample. The stratification was carried out according to NACE Rev. 2 two-digit activity, regions, and the company size. The regional stratification was carried out for the four statistical regions of the Republic of Serbia – Vojvodina, Belgrade, South and East Serbia, Šumadija and West Serbia. The strata for company size include companies with 5-20, 21-50, 51-250 and 251-500 employees. The optimal allocation of companies was made based on revenue and employment heterogeneity in each of the strata. Where the heterogeneity was higher, a larger sample was formed and vice versa. The survey sample (gross sample) consisted of 546 companies from the machines and equipment sector.

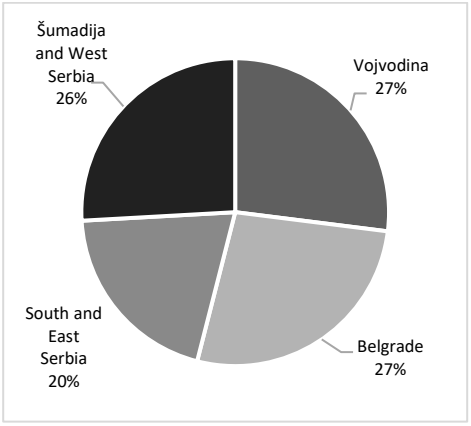
The number of companies surveyed consists of 452 (82.8% sample realization) companies from the machines and equipment sector. The time frame of the survey was set between June 20 and July 8, 2022. Table 1 presents the structure of the population, the survey sample (gross) and the final sample (net) according to the two-digit economic activities of NACE Rev. 2. Figure 1 shows the regional distribution of the final sample as well as the structure of the final sample according to company size measured by the number of employees.

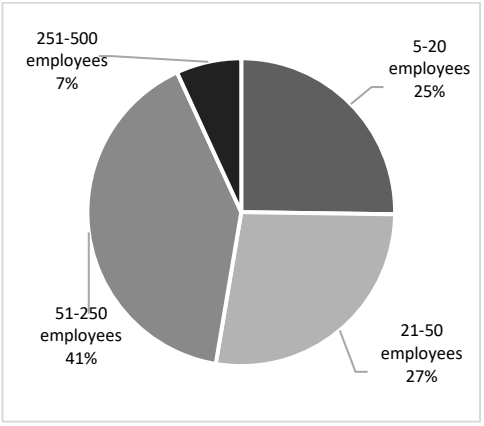
Table 1: The size and structure of the population, gross sample and net sample

NACE 2-dig	Activity	Population	Gross sample	Net sample
22	Manufacture of rubber and plastic products	566	63	57
25	Manufacture of fabricated metal products	1215	191	165
26	Manufacture of computer, electronic and optical products	173	53	43
27	Manufacture of electrical equipment	168	37	34
28	Manufacture of Equipment & Machinery n.e.c.	393	95	77
29	Manufacture of motor vehicles, trailers and semi-trailers	99	34	21
30	Manufacture of other transport equipment	41	15	13
32	Other manufacturing	58	29	24
33	Repair and installation of Equipment & Machinery	137	29	18
Total	**Equipment & Machines**	**2850**	**546**	**452**

Source: Author's research

Figure 1: Regional distribution of the final sample and its structure according to company size measured by the number of employees





Source: Author's research

In accordance with the main objective of the paper, as well as the three research questions, the companies were divided into two groups: those that have women in senior management and those whose senior management consists exclusively of men.

To assess the level of ICT adoption, the companies surveyed were asked whether they use any of the following technologies: Cloud service, Enterprise Resource Planning (ERP) software, Customer Relationship Management (CRM) software or the Internet of Things (IoT). The variable for the use of ICT is between 0 and 4, depending on whether a company uses none, one or more of these technologies (0 – does not use any technology; 1 – uses one technology; 2 – uses two technologies; 3 – uses three technologies; 4 – uses four technologies).

The vision regarding the company's development over the next five years is rated on a scale of 1 to 5 (1 – Pessimistic - it would be good if our business survives; 2 – Conservative - it would be good if production does not decline; 3 – Neutral I have no vision, it is important to continue; 4 – Moderately optimistic - annual growth of around 5-10%; 5 – Ambitious - at least doubling sales - market share).

Gender equality practices were analyzed based on the percentage of female employees in a company and on whether a company has policies and/or procedures in place that promote gender equality. For this purpose, the companies were divided into two groups: companies that have enforced policies (procedures) that promote gender equality and companies that have no such policies or have policies that cover some but not all aspects, or policies that are not enforced (0 – do not have policies and/or procedures that promote gender equity; have policies that cover some, but not all aspects; have policies that are not enforced; 1 – have policies and/or procedures that promote gender equity).

The statistical analysis included descriptive statistics and non-parametric tests to compare the differences between the groups.

Results and Discussion

The companies were divided into two groups depending on whether they had women in senior management positions. Table 2 provides descriptive statistics for each of the two groups for variables such as ICT use, growth vision, gender equality policy and the percentage of female employees. The Shapiro-Wilk test for normality is significant ($p<0.01$) for

each of the subsamples, indicating that the data is not normally distributed. Since the assumption of normality is necessary for parametric tests, the non-parametric Mann-Whitney test is used to determine whether there are differences between companies led by women and those led by men in terms of the use of ICT, growth vision and gender equality practices (gender equality policies and the percentage of female employees).

Table 2: Descriptive statistics with the Shapiro-Wilk test of normality

	Women among senior executives	**N**	**Mean**	**Std. Deviation**	**Shapiro-Wilk**	
					Statistic	**Sig.**
ICT adoption	No	142	0.68	0.86	0.76	0.00
	Yes	310	1.07	1.11	0.82	0.00
Growth vision	No	142	3.57	1.07	0.85	0.00
	Yes	310	3.92	0.87	0.78	0.00
Gender equality policies	No	142	0.36	0.48	0.61	0.00
	Yes	310	0.56	0.50	0.63	0.00
% of female employees	No	142	0.18	0.19	0.81	0.00
	Yes	310	0.27	0.22	0.85	0.00

The results are significant at the 0.01 level.

Source: Author's research

The Mann–Whitney test ranks the values of the entire sample in order from smallest to largest. It then compares the mean ranks for the two groups: Companies that have women in senior management and companies whose senior management consists exclusively of men (Table 3). The results of the test are significant ($p<0.01$) for all four dependent variables (ICT adoption, growth vision, gender equality policies and the percentage of female employees) (Table 4).

Table 3: Ranks

	Women among senior executives	N	Mean Rank	Sum of Ranks
ICT adoption	No	142	195.71	27791.50
	Yes	310	240.60	74586.50
Growth vision	No	142	196.59	27916.00
	Yes	310	240.20	74462.00
Gender equality policies	No	142	195.67	27785.00
	Yes	310	240.62	74593.00
% of female employees	No	142	179.03	25422.50
	Yes	310	248.24	76955.50

Source: Author's research

Table 4: Mann-Whitney Test

	ICT adoption	Growth vision	Gender equality policies	% of female employees
Mann-Whitney U	17638.50	17763.00	17632.00	15269.50
Wilcoxon W	27791.50	27916.00	27785.00	25422.50
Z	-3.61	-3.63	-3.92	-5.23
Asymp. Sig. (2-tailed)	0.00	0.00	0.00	0.00

Grouping Variable: Women among senior executives

The results are significant at the 0.01 level.

Source: Author's research

Companies that have women in senior management use ICT to a greater extent (M=1.07) than companies whose senior management consists exclusively of men (M=0.68). These findings are in line with previous research on SMEs (Alam, Ali, Erdiaw-Kwasie, Murray & Wiesner, 2022), which emphasizes the importance of women in leadership positions for ICT adoption. The greater use of ICT in companies with women in leadership positions reflects the proactive approach observed in women-led SMEs. This consistency across sectors emphasizes the broader pattern of women in leadership positions playing a central role in steering companies toward advanced technological integration.

The female managers in the machines and equipment sector are more optimistic about the development of their company over the next five years

(M=3.92) than managers of companies run exclusively by men (M=3.57). The connection between gender diversity in leadership and a positive organizational outlook is in line with the notion that diverse perspectives contribute to more forward-thinking and growth-oriented visions.

Finally, our research results show that companies led by women have more female employees and better policies (procedures) that promote gender equality than companies led by men. Women-led companies have, on average, 27% female employees, and 56% of them have implemented policies (procedures) that promote gender equality. Companies run exclusively by men, on the other hand, have an average of 18% female employees and only 36% of them have implemented policies (procedures) to promote gender equality. Women entrepreneurs show their dedication to creating inclusive workplaces by having more female employees and introducing policies that promote gender equality in their companies. This aligns with broader discussions on the multifaceted impact of gender diversity, not only in promoting equality but also in creating environments conducive to the professional growth of women.

Drawing parallels with findings in different industries, the disparities in female employee percentages and gender equality policy implementation further underline the sector-specific nature of gender dynamics. Integrating this with broader literature emphasizes the need for industry-specific strategies to address gender imbalances and promote inclusivity effectively.

Conclusion

Bridging the gender gap in entrepreneurship is not only a matter of fairness, but also an economic imperative that can bring significant benefits to individuals, communities and entire nations. This paper emphasizes the central role of women in leadership positions and shows a positive correlation with the introduction of ICT, growth optimism, and the implementation of gender equality measures. The paper posits that having women in leadership positions in the machines and equipment sector positively influences technology adoption, growth perspectives, and gender-inclusive policies. Companies with women in management positions use ICT to a greater extent, which indicates a proactive approach to digitalization. Furthermore, the increased optimism about future development among female managers indicates a strong link between gender diversity and positive growth visions. This positivity is not limited to

expectations but is also underpinned by the presence of more female employees and robust policies to promote gender equality in women-led organizations.

Research results suggest that gender diversity in senior management goes beyond just addressing equity concerns; it has a tangible positive impact on organizational outcomes. The outcomes encompass improved decision-making processes, increased adaptability to technological advancements, and a more inclusive and vibrant workplace culture. These implications can serve as a basis for business leaders, policymakers and researchers to advocate for and implement initiatives that promote diversity, equality and technological advancement in the machines and equipment sector. Our findings suggest that measures to promote gender diversity in leadership should be prioritized to drive technological innovation and organizational growth. Policymakers can use these findings to develop targeted initiatives that incentivize companies to adopt gender-balanced hiring and promotion practices to foster a more diverse and resilient workforce. In addition, our study highlights the importance of investing in ICT training and skills development programs tailored to female entrepreneurs and employees so that they can effectively leverage digital technologies for business growth.

By looking specifically at the machines and equipment sector in Serbia, our research not only confirms the positive correlation between women in leadership positions and organizational outcomes, but also pioneers research on this topic in the Serbian context. The findings reveal that bridging the gender gap is an important factor for the growth and prosperity of companies.

As a new contribution to the literature on women entrepreneurship in Serbia, this study emphasizes the need for further research in other industries to comprehensively address gender inequalities. The positive results observed in the machines and equipment sector can potentially serve as a catalyst for broader initiatives to promote diversity, equality and technological advancement in different sectors. This broadening of horizons in the study of women entrepreneurship in Serbia opens avenues for future research and encourages scholars to explore the economic benefits of gender diversity in various industries, thereby fostering an inclusive and thriving business environment.

Acknowledgments

The research presented in this paper was funded by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia under contract number 451-03-66/2024-03/200005.

The database used in this research is the result of the project Velika Mala Privreda (Big Small Business Project) funded by the United States Agency for International Development (USAID) and implemented by ACDI/VOCA, J.E. Austin Associates, CEVES, and the Divac Foundation.

References

[1] **Ajumobi, D.O., & Kyobe, M.** (2016). Towards a theoretical model to investigate ICT supported formal women business networks in sub-Saharan Africa. *Paper proceedings of advances in women's studies*. Unique Conferences Canada.

[2] **Alam, K., Ali, M.A., Erdiaw-Kwasie, M.O., Murray, P.A., & Wiesner, R**. (2022). Digital Transformation among SMEs: Does Gender Matter? *Sustainability*, *14*, 535. https://doi.org/10.3390/su14010535

[3] **Atif, M., Alam, M.S., & Hossain, M**. (2020). Firm sustainable investment: are female directors greener? *Business Strategy & the Environment*, *29*(8), pp. 3449-3469.

[4] **Block, E. S., & Erskine, L.** (2012). Interviewing by telephone: Specific considerations, opportunities, and challenges. *International journal of qualitative methods*, *11*(4), 428-445.

[5] **Braun, P.** (2010). Going green: Women entrepreneurs and the environment. *International Journal of Gender and Entrepreneurship*, *2*(3), 245-259. https://doi.org/10.1108/17566261011079233

[6] **Capozza, C. & Divella, M.** (2023). Gender diversity in European firms and the R&D-innovation-productivity nexus. *Journal of Technology Transfer*. https://doi.org/10.1007/s10961-023-10003-3

[7] **Cardella G.M., Hernandez-Sanchez, B.R., & Sánchez-Garcia, J.C.** (2020). Women Entrepreneurship: A Systematic Review to Outline the Boundaries of Scientific Literature. *Frontiers in Psychology*. 11:1557. https://doi.org/10.3389/fpsyg.2020.01557

[8] **Christiansen, L., Lin, H., Pereira, J., Topalova, P., & Turk, R.** (2016). Gender Diversity in Senior Positions and Firm Performance: Evidence from Europe. IMF Working Paper. Retrieved December 14, 2023, from https://www.imf.org/external/pubs/ft/wp/2016/wp1650.pdf

[9] **Chroneos Krasavac, B., Karamata, E., & Đorđević, V**. (2019). Innovative potential of environmentally motivated female entrepreneurship for

sustainable development in the Republic of Serbia. *Ekonomika poljoprivrede*, *66*(3), 721-735. https://doi.org/10.5937/ekoPolj1903721C

[10] **Crittenden, V. L., Crittenden, W. F., & Ajjan**, **H.** (2019). Empowering women micro-entrepreneurs in emerging economies: The role of information communications technology. *Journal of Business Research, 98*, 191–203.

[11] **del Mar Fuentes-Fuentes, M., Quintana-García, C., Marchante-Lara, M., & Benavides-Chicón, C. G**. (2023). Gender diversity, inclusive innovation and firm performance. *Sustainable Development*, *31*(5), 3622–3638. https://doi.org/10.1002/sd.2615

[12] **Eurostat**. (2008). European Commission NACE Rev. 2 – Statistical classification of economic activities in the European Community, Luxembourg: Office for Official Publications of the European Communities

[13] **Garg, K. & Shastri, S. (**2022). Export behaviour of firms in India: does gender of the firm owner matter? *International Journal of Gender and Entrepreneurship*, *14*(3), 417-434. https://doi.org/10.1108/IJGE-08-2021-0143

[14] **Global Entrepreneurship Monitor.** (2023). *Global Entrepreneurship Monitor 2022/23 Women's Entrepreneurship Report*.

[15] **Jovanović, O., & Lazić, M.** (2018). Women Entrepreneurship in Serbia – Potentials and Constraints. *Journal of Women's Entrepreneurship and Education*, (3-4), 60-72.

[16] **Kamath, B.** (2022). Board Gender Diversity and Intellectual Capital Performance of Firms in India. *Journal of Women's Entrepreneurship and Education*, (1-2), 97-116.

[17] **Lee, J. & Chung, J.** (2022). Women in top management teams and their impact on innovation. *Technological Forecasting and Social Change*, *183*, 121883. https://doi.org/10.1016/j.techfore.2022.121883

[18] **Marlow, S.** (2019). Gender and entrepreneurship: past achievements and future possibilities. *International Journal of Gender and Entrepreneurship*, *12*(1), 39-52.

[19] **Marques, H.** (2015). Does the Gender of Top Managers and Owners Matter for Firm Exports?, *Feminist Economics*, *21*(4), 89-117. https://doi.org/10.1080/13545701.2015.1029958

[20] **Milojević, A., Vujicic, S., Nikitović, Z., & Radović Marković, M.** (2021). Women's Entrepreneurship in Organic Production in Serbia. *Journal of Women's Entrepreneurship and Education*, (3-4), 184-198.

[21] **Ministry of Education, Science and Technological Development, Republic of Serbia**. (2020). Smart specialization strategy of the Republic of Serbia for the period 2020 to 2027. Retrieved December 14, 2023 from https://pametnaspecijalizacija.mpn.gov.rs/wp-content/uploads/2021/06/Strategija-pametne-specijalizacije_EN_WEB.pdf

[22] **Nguyen, B., Lin, H. & Vu, N.** (2023). Entrepreneurs' gender and small business going green. *International Journal of Entrepreneurial Behavior & Research*, *29*(7), 1720-1739. https://doi.org/10.1108/IJEBR-07-2022-0679

[23] **Onozaka, Y. & Nemoto, K**. (2023). Digital Transformation, Leadership, and Gender Equality: Are They Related?. In: Khare, A., Baber, W.W. (eds) Adopting and Adapting Innovation in Japan's Digital Transformation. Economics, Law, and Institutions in Asia Pacific. Springer, Singapore. https://doi.org/10.1007/978-981-99-0321-4_10

[24] **Pavlović, D., Bjelica, D., Bodroža, D., Jovičić, E. & Pindžo, R.** (2022). Women's Economic Empowerment through Tourism: A Case Study of Selected Western Balkans Countries. *Journal of Women's Entrepreneurship and Education*, (3-4), 149-175.

[25] **Reguera-Alvarado, N., De Fuentes, P. and Laffarga, J.** (2017). Does board gender diversity influence financial performance? Evidence from Spain. *Journal of Business Ethics*, *141*(2), 337-350.

[26] **Rietveld, C.A., & Patel, P.C**. (2022). Gender inequality and the entrepreneurial gender gap: Evidence from 97 countries (2006–2017). *Journal of Evolutionary Economics*, *32*, 1205–1229.

[27] **Sabarwal, S., & Terrell, K.** (2005). Does Gender Matter for Firm Performance? Evidence from Eastern Europe and Central Asia. IZA Discussion Paper No. 3758 October 2008. https://d-nb.info/991450973/34

[28] **Shamaki, H., Ibrahim, U. A. & Philemon, N. A.** (2022). Evaluating the Influence of Digital Technology on the Performance of Female-Owned Enterprises in Nigeria. *Journal of Women's Entrepreneurship and Education,* 1-2, 39-60.

[29] **UNCTAD.** (2014). *Empowering women entrepreneurs through information and communications technologies - A practical guide*. New York, Geneva: United Nations.

Article history: Received: January 31st, 2024

Accepted: March 19th, 2024

DOI: 10.28934/jwee24.12.pp177-206
JEL: L20

ORIGINAL SCIENTIFIC PAPER

Psychological Capital and Work Stress Mediated by Authentic Leadership and Moderated by Gender

Carlos Bazán Tejada [1]
Jaime Rivera Camino [2]
CENTRUM Católica Graduate Business School, Lima, Perú
Pontificia Universidad Católica del Perú, Lima, Perú

A B S T R A C T

The purpose of this study was to validate a model that examines the effect of psychological capital on work stress, the mediation of authentic leadership, and the moderating effect of gender on this relationship. The study used a structural equation analysis to validate the research hypotheses in a sample of firms from different industries. The results confirm that psychological capital has a negative impact on work stress, as well as a positive relationship with authentic leadership, and the latter has a negative impact on work stress. The mediating effect of authentic leadership on the relationship between psychological capital and work stress was also confirmed. In addition, gender moderation shows that the impact of psychological capital on reducing work stress is stronger for women than for men. The findings provide conceptual information for improving employee performance by empirically validating the relationship between three constructs that have not previously been studied in an integrated manner. It also takes into account the differences between men and women in coping with work stress, which is very important for organizations. The surveys of the constructs studied are a potential source of information for managers because they help identify factors that contribute to improved employee performance. As with all research that examines

[1] Corresponding author, e-mail: cabazan@pucp.pe
[2] E-mail: rjaime@pucp.pe

psychological constructs, the present study has limitations related to the operationalization of these constructs. Future studies could replicate and extend the research in other economic sectors and with other demographic and cultural variables. The influence of other contexts on the relationships studied could be identified.

KEYWORDS: *psychological capital, authentic leadership, work stress and gender*

Introduction

In recent years, there has been a growing need for organizations to understand the variables that help improve the performance of their employees (Zakaria et al., 2020) and examine whether there is any differentiation between women and men in these aspects. This search identified three variables: psychological capital, which helps to identify how to improve their professional career (Amor et al., 2021; Finch et al., 2020); work stress, which is a very influential variable that hinders their good performance (Uysal, 2019); and authentic leadership, which is a buffer variable for stressful situations that may affect them (Shahid & Muchiri, 2017).

The study of the variables that influence good employee performance is important because it contributes to a company's ability to develop a competitive advantage (Murtza et al., 2021). For this reason, it is the most studied in industrial management and organizational behavior (López-Cabarcos et al., 2022). However, there is a demand for further analysis of the variables that can affect it (Adil & Kamal, 2020; Reyhanoglu & Akin, 2022; Uysal, 2019), particularly to be able to identify the impact of gender on job performance, given that women constitute 50% of the workforce (Franczak & Margolis, 2022).

However, the literature review indicated that the variables in our study have been studied only in some specific sectors, mainly in Asian countries. That is why more studies are needed in other business sectors (Nair et al., 2021; Patnaik et al., 2021) and in other cultural contexts (Bilgeturk & Baykal, 2021; Hao et al., 2020).

To fill these gaps, a model based on theories of social cognition (Bandura, 1986) and resource conservation (Hobfoll, 1989) was empirically validated. This model integrated the relationships between the variables

proposed in the present study and analyzed them in a context where similar research is still lacking.

The structure of this article includes a review of the relevant literature and a summary of the theory supporting the hypotheses of the model. It also outlines the description of the methodology of the empirical study, presents the results, and discusses the main findings, considering the limitations of the study and suggesting possible future lines of research.

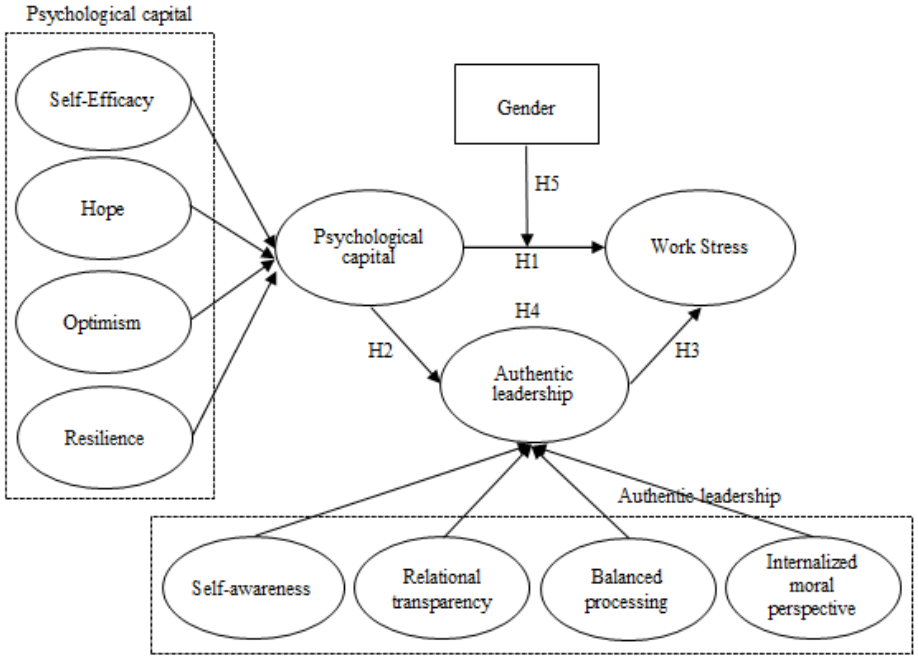
Theoretical Framework

Psychological capital is a highly influential variable in job performance that helps to resist and cope with work stress, so there is a need for further studies in different contexts (Patnaik et al., 2021) to clarify how it affects other determinants of work stress (Narsa & Wijayant, 2021). It is also conceptually related to the resource conservation model (Hotbfoll, 1989) and, thus, to leadership.

Work stress is a common phenomenon in different business environments that affects employees individually and differently (Kumasey et al., 2014; Zakaria et al., 2020) as well as the organization, so there is a need to study the factors that help to address it in more detail (Uysal, 2019). It is also essential to identify the impact of gender in relation to these variables, given the gender gap that exists due to a different distribution of financial resources and access to education between men and women (Antonijević et al., 2022).

Another variable that contributes to improving employee performance is managerial leadership (Zakaria et al., 2020) and, in particular, the authentic leadership construct (Crawford et al., 2020), which optimizes the development of psychological capital and the reduction of work stress through the fair allocation of resources (Adil & Kamal, 2020). There are several studies in the literature on the impact of authentic leadership, but more research is needed in countries with different cultures and business sectors (Bilgetürk & Baykal, 2021; Nair et al., 2021; Wu & Xu, 2022). Figure 1 shows the model based on the literature reviewed in the study. The hypothesized relationships between the constructs of the model are discussed below.

Figure 1: Theoretical model



Note(s). This figure presents the theoretical model and hypotheses. Single-headed arrows represent the hypothetical directional paths. Source: Author's own creation.

Source: Authors

Psychological Capital

This construct is defined as the state of the positive development of an individual, which comprises the psychological resources that he/she can manage to improve his/her performance (Luthans et al., 2007; Wang et al., 2017). It consists of four dimensions: self-efficacy or confidence to make an effort in the face of challenges, hope to persevere with goals and plans, optimism to maintain a positive attitude about the future, and resilience to overcome adversity (Luthans et al., 2007; Nolzen, 2018; Patnaik et al., 2021; Sekhar, 2021).

More specifically, self-efficacy is an individual's belief in his or her ability to act in the manner necessary to achieve specific goals and also reflects confidence in the ability to exert control over one's motivation, behavior, and social environment (Bandura, 1977). Therefore, self-efficacy influences the competencies that enable individuals to engage in modern

organizations characterized by different types of management and leadership (Zaman et al., 2021). Resilience is the factor that helps individuals adapt to environments that are perceived as stressful; it is considered a reflection of leadership ability and is also related to well-being, as it contributes to increased levels of self-efficacy (Warshawski, 2022). Hope is formed by the individual's belief that he or she can create viable ways to achieve his or her goals and is related to optimism, which helps employees achieve greater motivation by creating new possibilities through realistic goals in the organization (Kim et al., 2021).

Dimension 4, optimism, is a positive expectation of outcomes and a predictor of hope (Finch et al., 2020). Optimism makes it easier for people to engage in problem-solving behaviors (Black et al., 2020). It also maintains a positive approach through problem-oriented actions to create a controlled environment, even in the face of a difficult situation (Oja et al., 2019).

Work Stress

The construct of work stress is an individual phenomenon that occurs when an individual is faced with a situation in which he or she perceives that his or her capabilities are being exceeded (Narsa & Wijayant, 2021). It is part of the psychosocial emotions that affect performance (Lui & Johnston, 2019), and can occur momentarily or be sustained over time (Kumasey, 2014). Stress can also be influenced by factors such as behaviors, time pressures, level of workload, relationships between colleagues, and it can also include the type of profession, with a focus on organizational behavior and managerial responsibilities (Ismail et al., 2019).

According to Patnaik et al. (2021), work stress causes various problems in people's performance, mostly in the workplace, and occurs when people faced with a difficult or challenging situation perceive an individual lack of resources. This is related to Hobfoll's (1989) Resource Conservation Theory, which states that in the face of a stimulus, there are different responses caused by perception and that personal characteristics are resources for coping with stress. According to Pradhan et al. (2021), to better manage work stress, people need to identify their own resources and acquire future resources. It is a phenomenon that can occur in various activities related to the performance of employees (Lee & Lee, 2018). However, they can also be caused by social stressors (daily, family,

financial problems) and environmental stressors (humidity, lighting, poor ventilation) (Stranks, 2005).

Authentic Leadership

Walumbwa et al. (2008) mentioned that it is a construct that helps to develop a positive psychological capacity and ethical climate that reduces external negative factors that influence the performance of employees. Adil and Kamal (2020) indicated that authentic leadership is associated with a work climate that enhances the development of positive psychological capabilities in its employees to cope with work stress and that it is associated with negative psychological states. Authentic leadership involves ethical and transparent behaviors that create a trusting environment with employees to help them develop greater self-awareness, moral perspective, a better balance of information and transparent relationships, improving the management of work stress (Ismail et al., 2019). What distinguishes authentic leadership from other styles is that the leader fosters the development of followers through self-awareness and behavioral regulation (Sims et al., 2017). According to Kim et al. (2020), it is a construct that considers four dimensions: self-awareness (recognition of strengths and weaknesses), relational transparency (the leader has an approach of openness towards his/her followers), internalized moral perspective (the leader's virtues and values), and balanced processing (decision making with analysis of data and opinions of his/her followers).

Psychological Capital and Work Stress

The literature suggests that psychological capital helps to cope with work-related stress (Wang et al., 2017; Pradhan et al., 2021). There is also a mediating effect of psychological capital with work stress related to variables such as religion, satisfaction and sleep quality (Li & Zhang, 2019; Narsa & Wijayant, 2021, Pradhan et al., 2021; Wang et al., 2017; Xie et al., 2021). Regarding the effect of work stress, the literature indicates that it has a mediating effect on psychological capital, but relates it to other variables, such as employee turnover intention (Celik, 2017).

Many studies suggest that people with higher levels of psychological capital perform better and cope better with stress. It has also been found that each component of psychological capital can be related to stress in different ways, both as a buffer and as a contributor to stress (Narsa & Wijayant,

2021). In the work environment, stress has a higher frequency due to organizational and environmental factors that lead the individual to perceive a scenario that exceeds their capabilities. However, a person with positive psychological resources may have a greater advantage in preventing stress through self-efficacy and resilience to adapt quickly, as well as hope and optimism that help to generate different paths with a realistic approach to face and reduce work stress (Patnaik et al., 2021).

There is a study in the medical service area in China that shows that in some emergency departments, people with low stress did not have high psychological capital, but also that low work-related stress is associated with higher well-being and higher psychological capital (Hao et al., 2020). Employees with positive psychology, a part of psychological capital (Corbu et al., 2021; Friend et al., 2016), are able to cope with the challenges of work (Hao et al., 2020). It can also be mentioned that psychological capital has a greater effect when it acts as a whole, compared to the individual performance of its components (Luthans et al., 2007). This shows the need to continue studying this relationship and to consider some moderators that help to fully understand the impact of psychological capital (Patnaik et al., 2021). Therefore, Hypothesis 1 was formulated as follows:

H1. Psychological capital has a direct and negative impact on work stress.

Psychological Capital and Authentic Leadership

Some authors suggest that there is a mediating effect of psychological capital with authentic leadership, but relate it to employee behavior, job satisfaction, work engagement, and organizational culture (Kim et al., 2020; Hu et al., 2018; Ramalu & Janadari, 2020; Slåtten et al., 2019). Only one study of the relationship between psychological capital and authentic leadership theory has been found (Petersen & Youssef-Morgan, 2018).

Authentic leadership focuses on the behavior of leaders in an ethical climate. It also uses positive psychology to foster greater self-awareness, moral perspective, information balance, and transparency; thus, there is a link between psychological capital and authentic leadership (Slåtten et al., 2019). There are also studies that examine the relationship between authentic leadership and the psychological behaviors of workers in traditional settings. A study on public institutions in Indonesia showed that a greater effect between authentic leadership and psychological capital could

not be identified in home-based workers, mainly more in women than in men (Daraba et al., 2021).

Likewise, Shahid and Muchiri (2017) discussed the positive impact of authentic leadership on job performance through psychological capital. The literature also shows that authentic leadership creates an environment that can foster hope, self-efficacy, and resilience, three of the four components of psychological capital. As stated by Petersen and Youssef-Morgan (2018), psychological capital has a positive relationship as an antecedent in the development of authentic leadership, and psychological resources may have more relevance in the development of authentic leadership than organizational aspects. For this reason, it is necessary to include it in further studies, organizations, and data collection. Therefore, Hypothesis 2 was formulated as follows:

H2. Psychological capital has a direct and positive effect on authentic leadership.

Authentic Leadership and Work Stress

Authentic leadership is a construct that is related to stress, helps reduce burnout, improves organizational communication, and reduces turnover intentions (Adil & Kamal, 2020; Ismail et al., 2019; Lee & Lee, 2018). Although the relationship with stress has been studied in some countries and sectors, there is a need in academia to include more constructs that contribute to a better understanding of the influence of authentic leadership in managing work-related stress (Ismail et al., 2019).

In the literature, studies focusing on academic sectors have been identified, for example, in Malaysia, mainly in primary schools, where a moderate negative relationship between authentic leadership and teachers' work stress was found (Ismail et al., 2019). Other studies of university professors in Pakistan show an indirect influence of authentic leadership on burnout and performance (Adil & Kamal, 2020). There is also a study in the sales sector in Korea that identifies an important role of authentic leadership in creating a favorable environment that helps reduce work stress (Lee & Lee, 2018), which is reinforced by what was mentioned by Manoppo (2020) that work stress can be better managed by improving leadership skills. However, some authors (Donkor et al., 2022) mention that this relationship needs to be further analyzed. Therefore, Hypothesis 3 was formulated as follows:

H3. Authentic leadership has a direct and negative effect on work stress.

Mediating Effect of Authentic Leadership on Psychological Capital and Work Stress

Although there is research on the mediating effect of authentic leadership in improving employee effectiveness and performance, this research is only related to training and job performance (Mira & Odeh, 2019). The literature shows the mediating effect of authentic leadership on psychological capital related to organizational support, organizational climate, and volunteer behavior (Bilgetürk & Baykal, 2021; Wu & Xu, 2022). Other authors, such as Lee and Lee (2018), have mentioned that there is an effect of organizational communication between authentic leadership and psychological capital and between psychological capital and organizational communication and work stress.

In an organization, an authentic leadership style plays an important role in developing psychological capital and good working relationships that improve performance and minimize employee stress (Kong et al., 2018). Authentic leadership creates an appropriate climate as social support that generates moods and psychological strengths in individuals. It can also measure the organization's support for the further development of psychological capital (Bilgeturk & Baykal, 2021).

There is also evidence of the mediating effect in relation to work stress, but for other leadership styles, such as toxic leadership and ethical leadership. (Elci et al., 2012; Uysal, 2019). Although there is research on the mediating effect of authentic leadership, these publications are related to variables such as training and job performance, which proves the need for further research on the mediating effect of authentic leadership (Mira et al., 2019). Therefore, Hypothesis 4 (H4) was formulated as follows:

H4. Authentic leadership has a mediating effect between psychological capital and work stress.

Gender Relationship between Psychological Capital and Work Stress

The impact of gender on the work environment has become relevant due to the fact that women make up approximately 50% of the workforce and the impact they have as leaders on job performance (Franczak & Margolis, 2022). Additionally, according to a study in Serbia, women are at

a disadvantage in the labor market, due to differences in income level, access to jobs and education (Moravčević et al., 2023). Similarly, a study conducted in India indicated that increasing the sense of unity within companies increases the psychological effect and female empowerment (Sharma & Kumar, 2021).

In a study of doctoral students in China, Liu et al. (2020) found that gender had a moderating effect on psychological capital and industry, with this relationship being stronger for female students than for their male counterparts. Likewise, according to Buonomo et al. (2020), in the education sector, female principals have to make greater efforts than their male counterparts to maintain a good work-life balance, which may lead to female workers being more likely to suffer from higher levels of burnout.

As mentioned by Liu et al. (2020), women have a greater need than their male counterparts to increase their psychological capital in order to improve their work experience. Also, according to Buonomo et al. (2020), further studies are needed to consider a larger population of women because of the importance of the moderating role of gender in coping with highly stressful situations and the effect of gender on psychological capital and levels of work stress. Further studies are also needed because there is no agreement on the effect of gender in relation to psychological capital and work stress (Kim et al., 2020; Liu et al., 2020). Therefore, Hypothesis 5 (H5) was formulated as follows:

H5. Gender moderates the relationship between psychological capital and work stress.

Methodology

The population consisted of 55,000 Peruvian companies on the Peru Top 2022 list. The managers could be identified by their level of higher education and contacted by email. The resulting sample consisted of 250 valid responses from the commercial, service and manufacturing sectors. Demographic characteristics were categorized by age and sex. Age was categorized as 20 to 39 years (61.5%), 40 to 59 years (37.7%), and over 60 years (0.8%). And in terms of gender, 54.8% were men and 45.2% were women. In terms of education, all (100%) had postgraduate higher education.

The minimum sample size was based on two criteria. The first, using simple random sampling, obtained a confidence level of 2.5 sigma (95.5%),

the most adverse possible case (p=q=50), and a sampling error of +/- 5%. The second, conditioned by the use of PLS-SEM, indicated that a sample size of 100 to 200 was sufficient (Hoyle, 1995; Hair et al., 2009). Therefore, the sample size can be considered sufficient to validate the hypotheses and extrapolate the results.

Survey Instrument

To assess psychological capital, the questionnaire developed by Luthans et al. (2007) was used, which consists of four dimensions (self-efficacy, hope, optimism, and resilience). To measure work stress, the questionnaire proposed by Cohen et al. (1983) was applied. For the authentic leadership variable, the Walumbwa et al. (2008) questionnaire was used, which consists of four dimensions (self-awareness, relational transparency, balanced processing and internalized moral perspective). All items used a Likert scale ranging from one (strongly disagree) to five (strongly agree). Appendix 1 displays the survey instrument. In addition, the data corresponding to the control and moderating effect variables were coded: gender characteristics, age, type of organization, company sector, and role in their organization.

Results

The theoretical model includes reflective and formative constructs, and the PLS-SEM was used with the SmartPLS 3 statistical program to analyze the data. Likewise, the recommendations of Hair et al. (2021) were followed for the development of the different steps to be followed. The first step in the evaluation of reflective constructs was to evaluate the standardized outer loadings since each load needs to be greater than or equal to 0.7. The third column of Table 1 shows these loadings for each indicator. Only in the case of work stress some loadings were lower than the selected cut-off point (EL1, EL2 and EL3). However, no increase in construct reliability was observed after excluding these indicators. Therefore, it was decided to maintain all the indicators initially proposed for work stress.

The second step was to examine the results corresponding to the reliability of each construct, for which Cronbach's alpha and composite reliability were calculated. According to Table 1, Cronbach's Alpha results ranged from 0.788 to 0.936. Likewise, the results of the composite reliability were between 0.865 and 0.950. In both cases, adequate levels of

reliability were observed. In the third step, the convergent validity of the model was analyzed and the average variance extracted for each construct was calculated and evaluated (Hair et al. 2021). The mean variance extracted from each construct represents the sum of their respective loadings squared divided by the number of indicators. If the average variance extracted is greater than 0.5, the construct explains more than 50% of the variance of its indicators. On the other hand, if the mean of the extracted variance is less than 0.50, then more than 50% of the total variance is not attributable to the construct. It was also taken into account that each reflective construct has a correlation between its indicators. The last column of Table 1 shows that only work stress had an extracted mean variance lower than the cut-off point (0.479). However, Fornell and Larcker (1981) indicated that convergent validity is still adequate if the average variance extracted is less than 0.5 and the composite reliability is greater than 0.6.

Table 1: Assessment of the measurement model (reflective constructs)

Construct	**Abbrev.**	**Outer loading**	**Cronbach's alpha**	**Composite Reliability**	**Average variance extracted**
Self-Efficacy	AE1	0,893	0.936	0.950	0.759
	AE2	0.756			
	AE3	0.875			
	AE4	0.912			
	AE5	0.909			
	AE6	0.873			
Hope	EZ1	0.798	0.899	0.921	0.625
	EZ2	0.848			
	EZ3	0.710			
	EZ4	0.839			
	EZ5	0.862			
	EZ6	0.759			
	EZ7	0.703			
Optimism	OP1	0.858	0.912	0.934	0.739
	OP2	0.874			
	OP3	0.883			
	OP4	0.881			
	OP5	0.800			
Resilience	RE1	0.823	0.896	0.928	0.763
	RE2	0.913			
	RE3	0.893			

Construct	Abbrev.	Outer loading	Cronbach's alpha	Composite Reliability	Average variance extracted
	RE4	0.863			
Self-awareness	AC1	0.861	0.836	0.890	0.670
	AC2	0.804			
	AC3	0.844			
	AC4	0.762			
Relational	TR1	0.862	0.847	0.897	0.686
transparency	TR2	0.765			
	TR3	0.823			
	TR4	0.860			
Balanced	PE1	0.865	0.788	0.875	0.702
processing	PE2	0.882			
	PE3	0.761			
Internalized	PM1	0.822	0.842	0.905	0.760
moral	PW2	0.909			
perspective	PM3	0.882			
Work Stress	EL1	0.592	0.820	0.865	0.479
	EL2	0.614			
	EL3	0.671			
	EL4	0.716			
	EL5	0.768			
	EL6	0.728			
	EL7	0.739			

Note(s). AF: Self-efficacy; EZ: Hope; OP: Optimism; RE: Resilience; AC: Self-awareness; TR: Relational transparency; PE: Balanced processing; PM: Internalized moral perspective; EL: Work stress.

Source: Authors' calculation

In the next step, the criterion of Fornell and Lacker (1981) was followed to assess the discriminant validity. According to both authors, the square root of the average variance extracted (AVE) of a construct must not exceed the correlation of that construct with the rest. Table 2 shows the discriminant validity of the first-order constructs of the proposed model.

Table 2: Discriminant validity assessment

Abbrev.	AF	EZ	OP	RE	AT	TR	PE	PM	EL	AVE
AF	0.871[a]									0.759
EZ	0.677	0.791[a]								0.625
OP	0.842	0.681	0.860[a]							0.739
RE	0.847	0.676	0.841	0.874[a]						0.763
AC	0.498	0.498	0.488	0.475	0.819[a]					0.670
TR	0.473	0.440	0.421	0.439	0.773	0.828[a]				0.686
PE	0.322	0.276	0.295	0.306	0.531	0.541	0.838[a]			0.702
PM	0.537	0.471	0.438	0.502	0.719	0.740	0.501	0.872[a]		0.760
EL	-0.327	-0.302	-0.362	-0.348	-0.344	-0.356	-0.223	-0.352	0.692[a]	0.479

Notes. AF: Self-efficacy; EZ: Hope; OP: Optimism; RE: Resilience; AC: Self-awareness; TR: Relational transparency; PE: Balanced processing; PM: Internalized moral perspective; EL: Work stress; AVE (square root of the average variance extracted).

Source: Authors' calculation

The next step was to evaluate the second-order formative constructs. In order to analyze this type of construct, the standardized external loadings were observed since, according to Hair et al. (2021), external loadings must be significant and greater than 0.5. Table 3 shows the results for the formative constructs (psychological capital and authentic leadership). In both cases, the indicators were significant and between acceptable values (0.558 and 0.916).

As a final step, the collinearity of each indicator was examined using the variance inflation factor (VIF) index proposed by Hair et al. 2021). These authors suggest that values equal to or greater than 5 represent critical levels of collinearity between indicators of a given construct. The results presented in Table 3 show that the formative constructs included in the model do not present collinearity problems.

Table 3: Assessment of formative constructs and their collinearity

Relationship	Outer loading	Standard deviation	p-value	VIF
AE → CP	0.914	0.055	***	4.558
EZ → CP	0.857	0.072	***	2.056
OP → CP	0.863	0.062	***	4.450
RE → CP	0.887	0.049	***	4.545
AC → LA	0.902	0.041	***	2.893
TR → LA	0.858	0.059	***	3.108
PE → LA	0.558	0.107	***	1.499
PM → LA	0.916	0.042	***	2.544

*Notes. AE: Self-efficacy; EZ: Hope; OP: Optimism; RE: Resilience; AC: Self-awareness; TR: Relational Transparency; PE: Balanced Processing; PM: Internalized Moral Perspective; CP: Psychological Capital; LA: Authentic Leadership; ***p<0.001; VIF: variance inflation factor.*

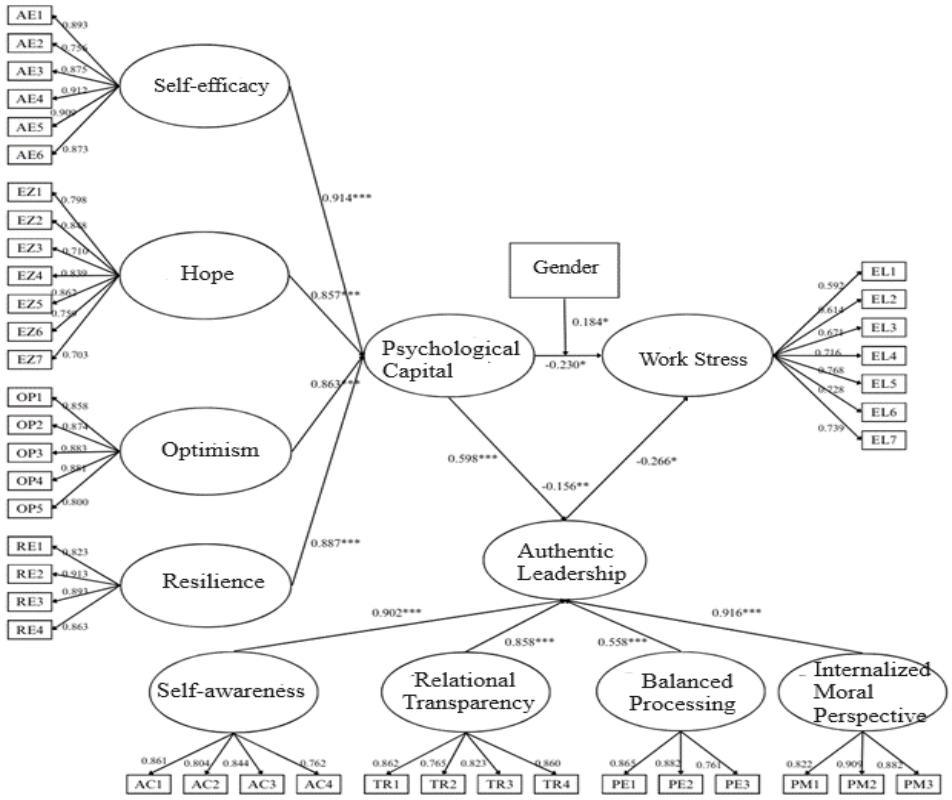
Source: Authors' calculation

Model Validation

Once the validity and reliability of the measurement model were confirmed, the structural model was examined. For this purpose, it was taken into account that the theoretical model included the estimation of a moderating effect (gender). Therefore, the two-stage approach (Chin et al., 2003) was implemented to analyze the effect of moderation when the independent variable is represented by a formative construct. This approach has greater statistical power and precision than the product indicator approach and the orthogonalization approach (Becker et al., 2018; Henseler & Chin, 2010).

The standardized root mean square residual (SRMR) and the normalized fit index (NFI) were used to evaluate the overall model fit. According to Henseler et al. (2015), the values of SRMR<0.08 and NFI>0.9 suggest that the data fit the model adequately. Therefore, the results obtained (SRMR=0.053 and NFI 0.937) indicate that the model has a satisfactory overall fit. Figure 2 shows the model structure relating the independent, moderator, and dependent variables under different values of the moderator variable.

Figure 2: Estimation results



Notes: This figure presents the theoretical model and hypotheses. Single-headed arrows represent directional paths. p<0.05 p**<0.01 p***<0.001. Source: Author's own creation.*

Source: Authors

Table 4 shows the results of bootstrapping the structural model. In particular, the model was estimated without the moderator variable in order to evaluate the direct effect instead of the simple effect (Hair et al., 2021).

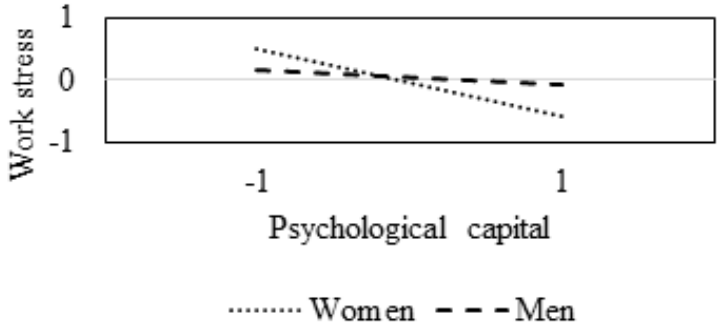
Table 4: Structural model estimation

Research hypothesis	Path Coefficient	Standard deviation	p-value	Bca CI
CP → EL	-0.230	0.083	0.013	[-0.343, -0.045]
CP → LA	0.598	0.091	***	[0.367, 0.751]
LA → EL	-0.266	0.102	0.010	[-0.427, -0.043]
CP → EL (mediation effect)	-0.156	0.059	0.009	[-0.271, -0.039]
CP → EL (moderation effect)	0.184	0.093	0.025	[0.060, 0.440]

*Notes. Bca CI: 95% bias-corrected and accelerated confidence intervals; ***p<0.001.*
Source: Authors' calculation

To complement this analysis, the graph of the slopes corresponding to the moderating effect of gender is presented. This graph shows the relationship between the independent and dependent variables (psychological capital and work stress) at different values of the moderator variable (gender). According to Figure 3, the dotted and dashed lines represent the relationship between psychological capital and work stress for women and men, respectively. It also shows that women have a lower slope than men. In other words, the negative relationship between psychological capital and work stress is strengthened in the presence of women, but this ratio decreases in the presence of men.

Figure 3: Gender moderator effect slope



Source: Authors

Hypothesis Validation

Hypothesis 1 predicted a direct and inverse relationship between psychological capital and work stress. The results (β= -0.230, p-value= 0.013) allow us to affirm that this hypothesis is validated, so the influence and direction proposed by the literature are correct.

Hypothesis 2 predicted a direct and positive relationship between psychological capital and authentic leadership. According to the results obtained (β=0.598, p-value<0.001), this hypothesis was validated, so the influence and direction between these constructs proposed by the literature was accepted.

Hypothesis 3 indicated a direct and negative relationship between authentic leadership and work stress. According to the results (β= -0.266, p-value=0.010), this hypothesis was validated, and therefore, the influence and direction between these constructs, which has been formulated by the literature, was also accepted.

Hypothesis 4 stated that authentic leadership would have a mediating effect on the relationship between psychological capital and work stress. The results indicate that there is an indirect effect that is negative and significant (β=-0.156, p-value=0.009), but the interaction term is positive and significant (p-value=0.025). In this way, a partial mediation of authentic leadership in the aforementioned relationship is validated.

Likewise, Hypothesis 5 predicted that gender would moderate the relationship between psychological capital and work stress. The results of the present study concluded that this relationship does exist, thus empirically validating the theoretical proposals of the literature on the subject.

Discussion

The purpose of this study was to identify the factors that contribute to improving employee performance and evaluate how they exert this influence. A model was developed and validated on a representative sample of different industries. Regarding the relationship between psychological capital and work stress, the results found are consistent with those reported in the literature. It suggests that employees who have resources of their psychological capital are better able to face the challenges of work and reduce their work stress. Therefore, these findings meet the need for further

study of these variables in a different context (Hao et al., 2020; Patnaik et al., 2021).

Similarly, the validation of the relationship between psychological capital and authentic leadership is also consistent with Petersen et al.'s (2018) research which was developed in a different context. The findings on the influence of authentic leadership on work stress are supported by other authors (Manoppo, 2020) and also respond to the need for further research (Ismail et al., 2019). Moreover, the mediating effect of authentic leadership in the relationship between psychological capital and work stress is related to other studies on the mediating effect of various leadership styles on work stress (Elci et al., 2012; Uysal, 2019). This highlights the need for further research, mainly in other cultures (Bilgetürk & Baykal, 2021; Mira et al., 2019).

The results on the impact of gender on the effects of stress contribute to reducing the inconsistencies found in the literature (Kim et al., 2020; Liu et al., 2021) and cover the need for further studies with samples of women entrepreneurs (Buonomo et al., 2020). In the entrepreneurial landscape in particular, women often face many challenges as a result of stereotypes and complex scenarios (Messikh, 2021; Rahman et al., 2022). According to Lazić et al. (2023), women entrepreneurs are considerably much more affected by economic instability than men. In this context, the study revealed that psychological capital represents a relevant resource to deal with work stress in the face of challenging working environments, particularly among women.

Conclusion

The study also has practical implications, reminding managers to encourage authentic leadership in their employees as it helps to reduce work stress, which is closely related to job performance (Mira & Odeh, 2019; Shahid & Muchiri, 2017). Likewise, a greater difference is identified in the reduction of work stress in women, which may be an effect of the empowerment of the respondents (Sharma & Kumar, 2021). It is essential that organizations adopt policies for valuing women at different executive levels.

The present study has several limitations. The research design, choice of data, and inferential procedures required unavoidable compromises. The use of retrospective perceptual measures of managers was a potential

limitation because such measures can introduce various forms of response bias. However, this is a methodological weakness shared by much of the research examining similar studies.

The study achieves its goals by providing a more complete understanding of the relationship between constructs that have been mentioned by other authors but have not been comprehensively validated. Therefore, this research provides results on three constructs that influence employee performance and the effect of gender that can affect the development of competitive advantage for organizations (Murtzaet al., 2021).

Finally, some recommendations for future research are presented. According to the results, authentic leadership and psychological capital are associated with low levels of work stress. In both cases, authentic leadership and psychological capital were represented by multidimensional constructs. In that sense, future studies should continue to examine mitigators of work stress from a multidimensional approach. Besides gender, future studies may include other sociodemographic variables as moderators, such as education level and age. Lastly, it is recommended that the proposed model be applied in other cultural settings. In particular, South American countries represent a suitable context, as women's labor force participation is increasing notably in this region.

References

[1] **Antonijević, M., Ljumović, I., & Ivanović, I.** (2022). Is there a Gender Gap in Financial Inclusion across Countries?. *Journal of Women's Entrepreneurship and Education*, 1–2, 79–96. https://doi.org/10.28934/jwee22.12.pp79-96

[2] **Adil, A., & Kamal, A.** (2020). Authentic leadership and psychological capital in job demands-resources model among Pakistani university teachers. *International Journal of Leadership in Education, 23*(6), 734-754. https://doi.org/10.1080/13603124.2019.1580772

[3] **Amor, A., Xanthopoulou, D., Calvo, N., & Vazquez, J.** (2021). Structural empowerment, psychological empowerment, and work engagement: a cross-country study. *European Management Journal*, *39*(6), 779-789. https://doi.org/10.1016/j.emj.2021.01.005

[4] **Bandura, A.** (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215.

[5] **Bandura, A.** (1986) *Social foundations of thought and action: A social cognitive theory*. Prentice Hall.

[6] **Becker, J. Ringle, C., & Sarstedt, M.** (2018). Estimating moderating effects in PLS-SEM and PLSc-SEM: Interaction term generation*data treatment. *Journal of Applied Structural Equation Modelling, 2*(2), 1-21. http://doi.org/10.47263/JASEM.2(2)01

[7] **Bentler, P. M.** (1995). *EQS Structural Equations Program Manual.* Encino, Multivariate Software.

[8] **Bilgeturk, M., & Baykal, E.** (2021). How does perceived organizational support affect psychological capital? The mediating role of authentic leadership. *Sciendo, 54*(1), 82-95. https://doi.org/10.2478/orga-2021-0006

[9] **Black, D., Bissessar, C., & Boolaky, M.** (2020). The missing HEROs: The absence of, and need for, PsyCap research of online university students. *The Journal of Open, Distance and e-Learning.* https://doi.org/10.1080/02680513.2020.1855133

[10] **Buonomo, I., Fiorilli, C., Romano, L., & Benevene, P.** (2020). The roles of work-life conflict and gender in the relationship between workplace bullying and personal burnout. A study on Italian school principals. *International Journal of Environmental Research and Public Health, 17*(23). https://doi.org/10.3390/ijerph17238745

[11] **Çelik, M.** (2017). The effect of psychological capital level of employees on workplace stress and employee turnover intention. *Innovar, 28*(68), 67-75. https://doi.org/10.15446/innovar.v28n68.70472

[12] **Chin, W., Marcolin, B., & Newsted, P.** (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research, 14*(2), 189-217. https://doi.org/10.1287/isre.14.2.189.16018

[13] **Cohen, S., Kamarck, T., & Mermelstein, R.** (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*(4), 385-396.

[14] **Corbu, A., Peláez Zuberbühler, M., & Salanova, M.** (2021). Positive psychology micro-coaching intervention: Effects on psychological capital and goal-related self-efficacy. *Frontiers in Psychology, 12,* Article 566293.

[15] **Crawford, J., Dawkins, S., Martin, A., & Lewis, G.** (2020). Putting the leader back into authentic leadership: Reconceptualising and rethinking leaders. *Australian Journal of Management, 45*(1), 114-133. https://doi.org/10.1177/0312896219836460

[16] **Daraba, D., Wirawan, H., Salam, R., & Faisal, M.** (2021). Working from home during the corona pandemic: Investigating the role of authentic leadership, psychological capital, and gender on employee performance. *Cogent Business & Management, 8*(1), Article 1885573. https://doi.org/10.1080/23311975.2021.1885573

[17] **Donkor, F., Appienti, W., & Achiaah, E.** (2022). The impact of transformational leadership style on employee turnover intention in state-

owned enterprises in Ghana. The mediating role of organisational commitment. *Public Organization Review, 22*, 1-17. https://doi.org/10.1007/s11115-021-00509-5

[18] **Elci, M., Sener, I., Aksoy, S., & Alpkan, L.** (2012). The impact of ethical leadership and leadership effectiveness on employees' turnover intention. The mediating role of work-related stress. *Procedia - Social and Behavioral Sciences, 58*(12), 289-297. https://doi.org/10.1016/j.sbspro.2012.09.1003

[19] **Finch, J., Farrell, L., & Waters, A.** (2020). Searching for the HERO in youth: Does psychological capital (PsyCap) predict mental health symptoms and subjective wellbeing in Australian school-aged children and adolescents? *Child Psychiatry & Human Development, 5*(1), 1025-1036. https://doi.org/10.1007/s10578-020-01023-3

[20] **Fornell, C., & Larcker, D.** (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39-50. https://doi.org/10.2307/3151312

[21] **Franczak, J., & Margolis, J.** (2022). Women and great places to work: Gender diversity in leadership and how to get there. *Organizational Dynamics*. https://doi.org/10.1016/j.orgdyn.2022.100913

[22] **Friend, S. B., Johnson, J. S., Luthans, F., & Sohi, R. S.** (2016). Positive psychology in sales: Integrating psychological capital. *Journal of Marketing Theory and Practice, 24*(3), 306-327. https://doi.org/10.1080/10696679.2016.1170525

[23] **Hair, J., Hult, G., Ringle, C., & Sarstedt, M.** (2021). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. SAGE Publications.

[24] **Hao, C., Zhu, L., Zhang, S., Rong, S., Zhang, Y., Ye, J., & Yang, F.** (2020). Serial multiple mediation of professional identity, and psychological capital in the relationship between work-related stress and work-related well-being of ICU nurses in China: A cross-sectional questionnaire survey. *Frontiers in Psychology*, *11*, Article 535634. https://doi.org/10.3389/fpsyg.2020.535634

[25] **Henseler, J., & Chin, W.** (2010). A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling. *Structural Equation Modeling, 17*(1), 82-109. https://doi.org/10.1080/10705510903439003

[26] **Henseler, J., Ringle, C., & Sarstedt, M.** (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115-135. https://doi.org/10.1007/s11747-014-0403-8

[27] **Hobfoll, S.** (1989). Conservation of resources: A new attempt at conceptualizing tress. *American Psychologist, 44*(3), 513-524. https://doi.org/10.1037/0003-066X.44.3.513

[28] **Hoyle, R.** (1995). *Structural Equation Modeling*. SAGE Publications.

[29] **Hu, Y., Wu, X., Zong, Z., Xiao, Y., Maguire, P., Qu, F., Wei, J., & Wang, D.** (2018). Authentic leadership and proactive behavior: The role of psychological capital and compassion at work. *Frontiers in Psychology,* 9, Article 2470. https://doi.org/doi/10.3389/fpsyg.2018.02470

[30] **Ismail, S. N., Abdullah, A. S., & Abdullah, A. G. K.** (2019). The effect of school leaders' authentic leadership on teachers' job stress in the Eastern part of Peninsular Malaysia. *International Journal of Instruction, 12(*2), 67-80. https://doi.org/10.29333/iji.2019.1225a

[31] **Kim, M., Do, Y., & Lee, H.W.** (2020). It is time to consider athletes' well-being and performance satisfaction: The roles of authentic leadership and psychological capital, *Sport Management Review, 23*(5), 964-977. https://doi.org/10.1016/j.smr.2019.12.008

[32] **Kim, M., Oja, B., & Anagnostopoulos, C.** (2023). An expanded psychological capital (A-HERO) construct for creativity: Building a competitive advantage for sport organisations. *European Sport Management Quarterly, 23*(3), 722-744. https://doi.org/10.1080/16184742.2021.1922480

[33] **Kong, F., Tsai, C.H., Tsai, F.S., Huang, W., & Malapitan, S.** (2018). Psychological capital research: A meta-analysis and implications for management sustainability. *Sustainability*, *10*(10), Article 3457. https://doi.org/10.3390/su10103457

[34] **Kumasey, A., Delle, E., & Ofei, S. B.** (2014). Occupational stress and organizational commitment: Does sex and managerial status matter? *International Journal of Business and Social Research, 4*(5), 173-182. https://doi.org/10.18533/ijbsr.v4i5.493

[35] **Lazić, M., Jovanović, O., & Lazarević-Moravčević, M.** (2021). Women's entrepreneurship in the wake of the COVID-19 crisis: The case of Serbia. *Journal of Women's Entrepreneurship and Education,* (1-2), 56-69. https://doi.org/10.28934/jwee21.12.pp56-69

[36] **Lee, G., & Lee, C.** (2018). The effects of workers' authentic leadership on job stress. Mediating effect of organizational communication and psychological capital. *Indian Journal of Public Health Research and Development, 9*(9), Article 1229. https://doi.org/10.5958/0976-5506.2018.01163.4

[37] **Li, Y., & Zhang, R.C.** (2019). Kindergarten teachers' work stress and work-related well-being: A moderated mediation model. *Social Behavior and Personality: An International Journal, 47*(11), 1-11. https://doi.org/10.2224/sbp.8409

[38] **Liu, X., Zou, Y., Ma, Y., & Gao, W.** (2020). What affects PhD student creativity in China? A case study from the Joint Training Pilot Project. *Higher Education 80(*4), 1-20. https://doi.org/10.1007/s10734-019-00463-8.

[39] **López-Cabarcos, M. Á., Vázquez-Rodríguez, P., & Quiñoá-Piñeiro, L. M.** (2022). An approach to employees' job performance through work environmental variables and leadership behaviours. *Journal of Business Research*, *140*, 361-369. https://doi.org/10.1016/j.jbusres.2021.11.006

[40] **Lui, J. N., & Johnston, J. M.** (2019). Working while sick: Validation of the multidimensional presenteeism exposures and productivity survey for nurses (MPEPS-N). *BMC Health Services Research*, *19*, Article 542. https://doi.org/10.1186/s12913-019-4373-x

[41] **Luthans, F., Avolio, B. J., Avey, J. B., & Norman, S. M.** (2007). Positive psychological capital: Measurement and relationship with performance and satisfaction. *Personnel Psychology, 60*(3), 541-572. https://doi.org/10.1111/j.1744-6570.2007.00083.x

[42] **Luthans, F., Youssef, C. M., & Avolio, B. J.** (2007). *Psychological capital developing the human competitive edge.* Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195187526.001.0001

[43] **Manoppo, V.** (2020). Transformational leadership as a factor that decreases turnover intention: A mediation of work stress and organizational citizenship behavior. *The TQM Journal, 32*(6), 1395-1412. https://doi.org/10.1108/TQM-05-2020-0097

[44] **Messikh, A.** (2021). The Entrepreneurial Intention of Algerian Women (a Sample Study of Skikda University Female Students). *Journal of Women's Entrepreneurship and Education*, (3-4), 134-150. https://doi.org/10.28934/jwee21.34.pp134-150

[45] **Mira, M. S., & Odeh, K.** (2019). The mediating role of authentic leadership between the relationship of employee training and employee performance. *Management Science Letters 9*(3), 381-388. http://doi.org/10.5267/j.msl.2018.12.011

[46] **Moravčević, M. L., Mosurović, M., & Minović, J.** (2023). Gender Inequality in Education and Science. *Journal of Women's Entrepreneurship and Education*, (3-4), 143-166. https://doi.org/10.28934/jwee23.34.pp143-166

[47] **Murtza, M. H., Gill, S. A., Aslam, H. D., & Noor, A.** (2021). Intelligence quotient, job satisfaction, and job performance: The moderating role of personality type. *Journal of Public Affairs*, *21*(3), Article e2318. https://doi.org/10.1002/pa.2318

[48] **Nair, B. P., Prasad, T., & Nair, S. K.** (2021). Role of leader and followers' well-being, engagement and the moderating role of psychological capital. *International Journal of Productivity and Performance Management, 1*, 741-0401. https://doi.org/10.1108/IJPPM-10-2020-0565

[49] **Narsa, N., & Wijayant, D.** (2021). The importance of psychological capital on the linkages between religious orientation and job stress. *Journal of Asia*

Business Studies, 15(4), 643-665. https://doi.org/10.1108/JABS-09-2018-0251

[50] **Nolzen, N.** (2018). The concept of psychological capital: A comprehensive review. *Management Review Quarterly*, *68*, 237-277. https://doi.org/10.1007/s11301-018-0138-6

[51] **Oja, B., Kim, M., Perrewé, P., & Anagnostopoulos, C.** (2019). Conceptualizing A-HERO for sport employees' well-being. *Sport, Business and Management: An International Journal, 9*(4), 363-380. https://doi.org/10.1108/SBM-10-2018-0084

[52] **Patnaik, S., Mishra, U. S., & Mishra, B. B.** (2021). Can psychological capital reduce stress and job insecurity? An experimental examination with Indian evidence. *Asia Pacific Journal of Management, 39*, 1071-1096. https://doi.org/10.1007/S10490-021-09761-1

[53] **Petersen, K., & Youssef-Morgan, C.** (2018). The "left side" of authentic leadership: Contributions of climate and psychological capital. *Leadership & Organization Development Journal, 39*(3), 436-452. https://doi.org/10.1108/LODJ-06-2017-0171

[54] **Pradhan, R. K., Jandu, K., Panda, M., Hati, L., & Mallick, M.** (2021). In pursuit of happiness at work: Exploring the role of psychological capital and coping in managing COVID-19 stress among Indian employees. *Journal of Asia Business Studies*.https://doi.org/10.1108/JABS-03-2021-0097

[55] **Rahman, M. M., Salamzadeh, A., & Tabash, M. I.** (2022). Antecedents of entrepreneurial intentions of female undergraduate students in Bangladesh: a covariance-based structural equation modeling approach. *Journal of Women's Entrepreneurship and Education*, (1-2), 137-153. http://doi.org/10.28934/jwee22.12.pp137-153

[56] **Ramalu, S., & Janadari, N.** (2020). Authentic leadership and organizational citizenship behaviour: The role of psychological capital. *International Journal of Productivity and Performance Management. 71*(2), 365-385. https://doi.org/10.1108/IJPPM-03-2020-0110

[57] **Reyhanoglu, M., & Akin, O.** (2022). Impact of toxic leadership on the intention to leave: Research on permanent and contracted hospital employees. *Journal of Economic and Administrative Sciences, 38*(1), 156-177. https://doi.org/10.1108/JEAS-05-2020-0076

[58] **Reinartz, W., Haenlein, M., & Henseler, J.** (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing, 26*(4), 332-344. https://doi.org/10.1016/j.ijresmar.2009.08.001

[59] **Sekhar, C.** (2021). Do high-commitment work systems engage employees? Mediating role of psychological capital. *International Journal of Organizational Analysis*, *30*, 1000-1018. https://doi.org/10.1108/ijoa-10-2020-2466

[60] **Shahid, S., & Muchiri; M.** (2017). Positivity at the workplace: Conceptualising the relationships between authentic leadership, psychological capital, organisational virtuousness, thriving and job performance. *International Journal of Organizational Analysis, 27*(3), 494-523. https://doi.org/10.1108/IJOA-05-2017-1167

[61] **Shahsavar, Z., & Kourepaz, H.** (2020). Postgraduate students' difficulties in writing their theses literature review. *Cogent Education 7*(1). http://doi.org/10.1080/2331186X.2020.1784620

[62] **Sharma, S., & Kumar, A.** (2021, December 13). Can Social Enterprises Create Holistic Women Empowerment? Journal of Women's Entrepreneurship and Education. https://doi.org/10.28934/jwee21.34.pp96-112

[63] **Sims, C., Gong, T., & Hughes, C.** (2017). Linking leader and gender identities to authentic leadership in small businesses. *Gender in Management*, *32* (5), 318-329.

[64] **Slåtten, T., Lien, G., Fosse Horn, C., & Pedersen, E.** (2019). The links between psychological capital, social capital, and work-related performance – A study of service sales representatives. *Total Quality Management & Business Excellence*, *30*(1), S195-S209, https://doi.org/10.1080/14783363.2019.1665845

[65] **Stranks, J.** (2005). *Stress at work: Management and prevention*. Butterworth-Heinemann.

[66] **Uysal, H.** (2019). The mediation role of toxic leadership in the effect of job stress on job satisfaction. *International Journal of Business, 24*(1), 1083-4346.

[67] **Walumbwa, F. O., Avolio, B. J., Gardner, W. L., Wernsing, T. S., & Peterson, S. J.** (2008). Authentic leadership: Development and validation of a theory-based measure. *Journal of Management, 34*(1), 89-126. https://doi.org/10.1186/1471-2458-12-915

[68] **Wang, Z., Liu, H., Yu, H., Wu, Y., Chang, S., & Wang, L.** (2017). Associations between occupational stress, burnout and well-being among manufacturing workers: Mediating roles of psychological capital and self-esteem. *BMC Psychiatry, 17,* 364. https://doi.org/10.1186/s12888-017-1533-6

[69] **Warshawski, S.** (2022). Academic self-efficacy, resilience and social support among first-year Israeli nursing students learning in online environments during COVID-19 pandemic. *Nurse Education Today, 110*. https://doi.org/10.1016/j.nedt.2022.105267

[70] **Wu, Y., & Xu, L.** (2022). The effect of authentic leadership and organizational climate on the volunteering behavior of college students: A moderated mediation model. *PsyCh Journal, 1*(11). https://doi.org/10.1002/pchj.611

[71] **Xie, Y., Tian, J., Jiao, Y., Liu, Y., Yu, H., & Shi, L.** (2021). The impact of work stress on job satisfaction and sleep quality for couriers in China: The role of psychological capital. *Frontiers in Psychology, 12,* Article 730147. https://doi.org/10.3389/fpsyg.2021.730147

[72] **Zakaria, N. H., Alias, M., & Rani, N.** (2020). Employee's productivity: The most dominant factors. *International Journal of Entrepreneurship and Management Practices, 3*(9), 1-13. https://doi.org/10.35631/IJEMP.39001

[73] **Zaman, U., Florez-Perez, L., Farías, P., Abbasi, S., Khwaja, M. G., & Wijaksana, T. I.** (2021). Shadow of your former self: Exploring project leaders' post-failure behaviors (resilience, self-esteem and self-efficacy) in high-tech startup projects. *Sustainability 13*, Article 12868. https://doi.org/10.3390/su132212868

Appendix

Appendix 1: Survey instrument

Statement	Abbrev.
Self-efficacy	
I know that I can analyze a long-term problem and find a solution	AE1
I feel confident contacting people outside the company (e.g., suppliers or customers) to discuss some problems	AE2
Even if the supervisor asks me to do extra work that I have never done, I trust in my ability to do it	AE3
I trust my performance and know that I can work under pressure and face challenging circumstances	AE4
I know that I can achieve my work objectives	AE5
If organizations change to a difficult-to-understand new system, I am sure I will be able to learn new things from that system	AE6
Hope	
I am currently pursuing my work goals vigorously	EZ1
I have several ways to achieve my work objectives	EZ2
Since I discovered that my performance appraisal was lower than the expected goal, I try to find other ways to work and improve	EZ3
Currently, I feel energized to achieve my work goal	EZ4
When I set goals and plan to work, I focus on achieving the goal	EZ5
I work based on the goals set by the belief "Where there is a will, there is a way"	EZ6
I tend to handle difficulties in one way or another at work	EZ7
Optimism	
I have optimism about what will happen to me in the future regarding work	OP1
At work, I know I can find a solution to every problem	OP2
I think that all the problems occurring at work always have a positive side	OP3
If I have to face a difficult situation, I believe that things will change for the better	OP4

Statement	**Abbrev.**
Regarding my current job, I believe that I will be successful in the future	OP5
Resilience	
I tend to take stressful things at work calmly	RE1
Even if I have failed at work, I try to do better again	RE2
Even though I feel uncomfortable with a lot of responsibility at work, I can go ahead and achieve success	RE3
I am undiscouraged and I am ready to face work difficulties	RE4
Self- awareness	
I can list my strengths and weaknesses	AC1
I seek feedback from others and act on it to improve	AC2
I accept the feelings I have about myself	AC3
I am aware of how others see me	AC4
Relational transparency	
I encourage people to share their opinions even if they oppose mine	TR1
I am true to myself. I always say what I mean and mean what I say	TR2
I admit when I have made a mistake	TR3
I support people and encourage them to pursue their dreams	TR4
Balanced processing	
Before any decision, I listen carefully to other people's points of view	PE1
I influence people to share my ethical views	PE2
I always do what is best for me	PE3
Internalized moral perspective	
My decisions in life are based on my core values and beliefs	PM1
I lead others based on my moral compass	PW2
I act based on my moral compass	PM3
Work stress	
How often have you successfully coped with the hassles of everyday life?	EL1
How often have you felt that you were coping effectively with major changes occurring in your life?	EL2
How often have you felt confident about your ability to handle your problems?	EL3
How often have you felt that things were going your way?	EL4

Statement	**Abbrev.**
How often have you been able to control what bothers you in your life?	EL5
How often have you felt that you had everything under control?	EL6
How often have you been able to control how you spend your time?	EL7

Article history: Received: November 3rd, 2023
Accepted: March 26th, 2024

DOI: 10.28934/jwee24.12.pp207-226
JEL: J16, J24, L1, L26

ORIGINAL SCIENTIFIC PAPER

Perceived Technological Innovativeness, Entrepreneurial Proactiveness, and Performance in Established Women-Led Companies

Nansy Karali[1]
University of Piraeus, Department of Economics, Piraeus, Greece
Christos Livas[2]
University of Patras, Department of Business Administration, Rio, Greece
Faidon Theofanidis[3]
Australian University, College of Business, Marketing Department, Kuwait

A B S T R A C T

The contribution of women as corporate executives to their companies' entrepreneurial outcomes is significant, as they can often enhance critical aspects of organizational innovativeness and proactiveness. This research investigated the effect of perceived technological innovativeness (PTI) on perceived entrepreneurial proactiveness (PEP) and, subsequently, the effect of PEP on the perceived company performance (PCP) of established firms with females in their top management teams. An examination of a judgmental sample of 83 female executives employed in Greek firms with over €10 million annual turnover showed that PTI had a significant and positive effect on PEP, and subsequently, PEP had a significant and positive effect on PCP. Apart from corroborating existing literature about the positive impact of entrepreneurial proactiveness on company performance, the study indicated that, according to the perceptions of female

[1] Corresponding author, e-mail: karalin@unipi.gr
[2] E-mail: clivas@upatras.gr
[3] E-mail: f.theofanidis@au.edu.kw

executives, entrepreneurial proactiveness acts as a bridge between technological innovativeness and company performance. Thus, it appeared that when a company is characterized by (or fosters the advancement of) technological innovativeness, it encourages creative thinking and focuses on opportunity identification and exploitation. This proactive approach to technological innovativeness enables the organization to improve its performance by staying ahead of its competitors, adapting to the dynamic environment, anticipating future market trends and exploiting opportunities.

KEYWORDS: *corporate entrepreneurship, technological innovativeness, entrepreneurial proactiveness, company performance, established companies, female executives*

Introduction

In the contemporary and dynamic business environment, the contribution of women, either as individual entrepreneurs or as corporate executives, to innovation and economic growth is significant (Hunt, Layton, & Prince, 2015; Lyngsie & Foss, 2017). However, despite the growing recognition of their contribution, there remains a scarcity of studies examining women executive's perceptions about their companies' entrepreneurial outcomes, as well as female-led businesses in particular. As the international business environment evolves, organizations are faced with perilous strategic and tactical decisions (Livas, Theofanidis, & Karali, 2023). Thus, the ability of companies to innovate and proactively adapt becomes crucial for success. In this context, this study focuses on female executives and their companies, with the purpose of unraveling the relationships between technological innovativeness, entrepreneurial proactiveness, and company performance. Therefore, this research seeks to contribute not only to the academic discourse on entrepreneurship, but also to provide practical insights and inform strategic decision-making.

Existing literature suggests that the inclusion of qualified women in top management teams is positively associated with companies' performance (Krishnan & Park, 2005; Smith, Smith, & Verner, 2006), as it contributes to strategic renewal and innovation (Post, Lokshin, & Boone, 2022). Considering the (often) symbiotic association between innovativeness and entrepreneurial proactiveness (Liu et al., 2017), the present study aims to investigate the interrelationships between technological innovativeness, entrepreneurial proactiveness, and company performance in a targeted

judgmental sample of established companies led by women in top management positions. More specifically, given that the successful market introduction and commercialization of innovative products are contingent upon the extent to which innovative firms have a proactive philosophy (Sandberg, 2002), this research tests the effect of perceived technological innovativeness on perceived entrepreneurial proactiveness and, subsequently, the effect of perceived entrepreneurial proactiveness on perceived company performance.

Literature Review and Hypotheses Development

Women in Top Management Teams

Although several companies appear to have made efforts to increase the number of women in leadership positions, women's representation remains limited (Hideg & Shen, 2019; Hunt, Layton, & Prince, 2015). This phenomenon may contribute to the continuation of workplace segregation practices and misbeliefs about women's performance and abilities (Stainback, Kleiner, & Skaggs, 2016). Apart from popular explanations relating to the glass ceiling phenomenon, the limited representation of women in top management, executive, or leadership teams has been attributed to the existence of implicit quotas (Dezső, Ross, & Uribe, 2016). This perspective suggests that a company's leadership may only attempt to have a small number of women in executive positions, beyond which they do not actively seek to include more women in organizational leadership (Dezső et al., 2016). On the occasion that women do reach the executive or top management level, they are likely to be paid less than their male colleagues (Perryman, Fernando & Tripathy, 2016).

Despite women being more likely to experience financial exclusion (Antonijević, Ljumović, & Ivanović, 2022) and lack certain digital competencies (Ivanović et al., 2021), their inclusion in top management teams has been positively associated with improved financial performance (Hunt, Layton, & Prince, 2015; Perryman, Fernando & Tripathy, 2016) in the long run (Jeong & Harrison, 2017), as well as with better business operations and performance (Moreno-Gómez, Lafuente, & Vaillant, 2018). This positive impact has been attributed to greater employee productivity (Luanglath, Ali, & Mohannak, 2019), collaboration, satisfaction, and loyalty, increased access to the existing talent pool, and improved customer

orientation (Hunt et al., 2015). Although the exact impact of women's inclusion in top management teams is likely to be context-specific (Jeong & Harrison, 2017; Luanglath, Ali, & Mohannak, 2019), empirical evidence suggests that companies lacking women in executive positions are lagging in their industries (Hunt, Layton, & Prince, 2015).

From a corporate entrepreneurship point of view, the inclusion of women in top management teams has been assumed to positively affect company performance by reducing strategic risk-taking (Jeong & Harrison, 2017; Perryman et al., 2016). At the same time, increased gender diversity in companies has been found to boost entrepreneurial outcomes, particularly in terms of enhancing product innovation (Lyngsie & Foss, 2017) and creative problem-solving (Hunt et al., 2015). Thus, the inclusion of women in corporate leadership is likely to introduce new strategic perspectives, augment existing organizational capabilities, and ultimately enhance the entrepreneurial posture of their firms.

Technological Innovativeness, Entrepreneurial Proactiveness, and Company Performance

The concept of companies' entrepreneurial orientation, which is perceived either as unidimensional (Covin & Slevin, 1989) or multidimensional (Lumpkin & Dess, 1996), encompasses several discrete aspects (or dimensions). In both conceptualizations, proactiveness and innovativeness play a key part in the measurement of entrepreneurial orientation (Morris & Paul, 1987) and have been associated with significant positive effects on company performance (Kreiser et al., 2013; Rauch, et al., 2009). However, such effects may be stronger in established companies (Su, Xie & Li, 2011) and are likely to be moderated by environmental factors, especially related to economic and technological developments (Simovic et al., 2024), organizational elements (Kreiser & Davis, 2010; Lumpkin and Dess, 1996; Lumpkin & Dess, 2001; Rauch, et al., 2009), and marketing strategies related to segmentation, targeting and positioning (Theofanidis & Livas, 2007). More specifically, established firms rely heavily on entrepreneurial orientation for the further enhancement of their competitive advantage through opportunity detection (Su, Xie & Li, 2011) and are more likely to develop entrepreneurial orientation if they are already marketing-oriented (Morris & Paul, 1987).

Nevertheless, assuming the multidimensional conceptualization of entrepreneurial orientation, there is scarce empirical evidence considering

the relationships between the dimensions of entrepreneurial orientation. Proactiveness, which is conceptualized as companies' responses to opportunities, has been positively related to company performance (Blesa & Ripollés, 2003; Fadda, 2018), particularly in dynamic environments and during the industry growth stage (Lumpkin & Dess, 2001). To this extent, empirical evidence has also supported the positive effect of entrepreneurial proactiveness on social and firm performance in the context of female entrepreneurship (Muindi & Masurel, 2022). To exploit opportunities, entrepreneurially proactive companies anticipate and respond to future demand (Dess & Lumpkin, 2005; Engelen et al., 2014; Schillo, 2011) by having a better understanding of their markets (Kraus et al., 2012). As a result, such companies are often able to shape their competitive environment (Knight & Cavusgil, 2004), gain competitive advantage, dominate distribution channels, and enjoy considerable brand recognition (Lumpkin & Dess, 2001).

This form of proactive entrepreneurship focuses on the pursuance of opportunities by taking bold - but not too risky - actions, exploiting company assets, and being more active in product innovation (Avlonitis & Salavou, 2007). Thus, the entrepreneurial proactiveness of companies has been assumed to positively affect innovation generation (Craig et al., 2014), the introduction of market-focused and technologically innovative products (Talke, Salomo & Kock, 2011), the performance of new products (Avlonitis & Salavou, 2007), and ultimately companies' performance (Talke et al., 2011).

Existing literature argues that the hypothesized positive association between proactiveness and innovativeness is also prominent in technologically oriented organizational contexts. More specifically, technology-proactive companies have been assumed to be more willing to invest in technological leadership (García-Morales, Ruiz-Moreno, & Llorens-Montes, 2007). Thus, authors have proposed that proactiveness can lead to radical innovation (Covin et al., 2016), and that proactive technological innovations can significantly increase the sales and profits of companies with sufficient resources (Liem, Khuong & Khanh, 2019).

Although the relationship between innovativeness and proactiveness has not been extensively assessed by prior literature, the above argumentation implies that companies' entrepreneurial proactiveness is likely to precede the formulation of innovativeness. However, the opposite may also be true, as an organizational culture of technological

innovativeness may drive companies to develop several aspects of entrepreneurial proactiveness. To fully exploit their innovative culture, technologically innovative companies may have to stay informed about emerging technologies that are relevant to their industries and target markets, adapt quickly to changing market conditions, and foster a mindset of rapid opportunity detection prior to their competitors. To this end, it is plausible that proactiveness may mediate the relationship between technological innovativeness and company performance (Jalali, Abhari & Jaafar, 2022).

In view of the preceding literature review, it can be argued that fostering a technologically innovative organizational culture may contribute to increased proactiveness (Jalali et al., 2022). This is because, in order to ensure the relevance and worth of innovation, companies will have to develop appropriate mechanisms to anticipate and respond swiftly and effectively to changes in their markets. In the case of female-led companies, the presence of women in top management teams has been associated, among others, with heightened innovativeness (Lyngsie & Foss, 2017; Talke et al., 2011). Women leaders may often introduce diverse perspectives and collaborative approaches (Hunt et al., 2015), which can stimulate continuous improvement and innovative initiatives. Lastly, established companies with heightened innovativeness are expected to benefit from a proactive stance (Su et al., 2011), as they will be better able to match their innovation capabilities to market dynamics (Shamaki, Ibrahim & Philemon, 2022). Therefore, in the case of established businesses with women in their top management teams, it is hypothesized that:

H_1: Perceived technological innovativeness positively affects perceived entrepreneurial proactiveness.

H_2: Perceived entrepreneurial proactiveness positively affects perceived company performance.

Research Methods

Study Sample

A judgmental (non-probability) sample of 83 female executives employed in firms with over €10 million annual turnover operating in Greece participated in the study. The rationale for selecting large and established companies was based on the assumption that executives in such

organizations are more likely to be cognizant of strategic and entrepreneurial decisions made, as well as on the expectation that such corporate decisions are more likely to have a substantial impact on domestic economic activity. Overall, the vast majority of the companies included in the study employed over 50 individuals (84.3%) and had an international scope of operations (66.3%). Regarding business sectors, the companies of the sample were predominately industrial (34.9%), commercial (31.3%), and service providers (27.7%). On average, companies were in operation for approximately 43.5 years.

Measurement

Using established measurement scales for the latent constructs of interest, perceived entrepreneurial proactiveness (PEP) was measured with three items (Covin & Slevin, 1989) and perceived company performance (PCP) with five items (Lin & Shih, 2008). The respondents were also asked to indicate their perceptions about the level of their company's technological innovativeness (PTI) using a balanced Likert item (Covin & Slevin, 1989). With respect to the measurement of PTI, the present study employed the sole Likert item from the entrepreneurial orientation scale, which explicitly refers to companies' technological innovativeness [i.e., participants were required to indicate their level of agreement or disagreement on a scale from 1 (very strongly disagree) to 7 (very strongly agree) with the following statement: '*In general, the top managers of my firm favor a strong emphasis on R&D, technological leadership and innovations*'] (Covin & Slevin, 1989), to ensure methodological and conceptual consistency (i.e., the multi-item measurement scale for proactiveness was obtained from the same scale). In line with existing literature and common research practice, the data from this item were deemed to be of interval measurement scale (Brown, 2011; Knapp, 1990).

Furthermore, despite the association of survey-based research with the threat of self-report (or response) bias, based on the characteristics of the participants and the nature of the present study, it is valid to assume that such risks are significantly minimized. Respondents were recognized professionals employed in already established organizations and knowledgeable in the topics of interest. Thus, they were deemed to be less likely to unintentionally provide wrong evaluations of their companies' PTI, PEP and PCP, as well as to intentionally conceal their true evaluations to gain approval by making themselves or their companies appear in a certain

way (e.g., socially desirable, or professionally distinguished). Lastly, the study did not demonstrate common method bias as the single factor extracted with the application of Harman's single factor test (Podsakoff *et al.*, 2003) accounted for approximately 44,36% of data variance.

In view of the above, a confirmatory factor analysis performed with IBM AMOS software (v.24) on PEP and PCP (Table 1), indicated an excellent model fit as per the relevant literature (Hair *et al.*, 2014). The measurement model also demonstrated satisfactory levels of measurement reliability / internal consistency (Cronbach's α for both constructs > 0.7), convergent validity (AVE values > 0.5) and discriminant validity (AVE > MSV).

Table 1: Measurement model properties (CFA)

Constructs *(Items)*	**Standardized Loadings (β)**	**Internal Consistency**	**AVE**	**MSV**
Perceived Company Performance (PCP)		0.93	0.74	0.09
(PCP1) Profitability in relation to competitors	0.88	-	-	-
(PCP2) Sales increase in relation to competitors	0.87	-	-	-
(PCP3) Market share increase in relation to competitors	0.91	-	-	-
(PCP4) Return on investment in relation to competitors	0.77	-	-	-
(PCP5) Overall company performance in relation to competitors	0.86	-	-	-
Perceived Entrepreneurial Proactiveness (PEP)		0.85	0.68	0.09
(PEP1) In dealing with its competitors, my firm typically initiates actions to which competitors then respond	0.67	-	-	-
(PEP2) In dealing with its competitors, my firm is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc.	0.93	-	-	-
(PEP3) In general, the top managers of my firm have a strong tendency to be ahead of other competitors in introducing novel ideas or products	0.84	-	-	-

Notes: (1) CFA Fit statistics: CMIN/DF =1.140, p = 0.307, CFI = 0.995, TLI = 0.992, RMSEA = 0.041, PCLOSE = 0.520, SRMR = 0,045; (2) Internal consistency was estimated with Cronbach's α; (3) AVE and MSV stand for Average Variance Extracted and Maximum Shared Variance respectively and they were used as measures of convergent and discriminant validity.

Source: Authors

Data Analysis

Univariate and Bivariate Analysis

After confirming the proposed factorial structure, the study proceeded to estimate the descriptive parameters (Table 2) and bivariate correlations (Table 3) among the variables of interest. The female executives indicated that their companies were above average in terms of PTI (mean value = 5.17 on a scale from 1-7), PEP (mean value = 4.93 on a scale from 1-7), and PCP (mean value = 5.17 on a scale from 1-7). Considering that the absolute z-value of skewness and kurtosis was below 3.29, it was assumed that the distribution of PTI, PEP and PCP was approximating the normal distribution (Kim, 2013).

Table 2: Descriptive parameters

Parameters	**PTI**	**PEP**	**PCP**
Mean	5.17	4.93	5.17
Median	5.00	5.00	5.40
Mode	7.00	5.33	6.00
Std. Deviation	1.61	1.12	1.12
Skewness	-0.66	-0.50	-0.43
SE of Skewness	0.26	0.26	0.26
z-Skewness	-2.50	-1.92	-1.65
Kurtosis	-0.46	0.80	-0.10
SE of Kurtosis	0.52	0.52	0.52
z-Kurtosis	-0.88	0.33	-2.60

Notes: (1) n = 83; (2) All variables were measured on a 7-point scale; (3) One-sample t-tests for PTI, PEP and PCP indicated that the mean values were statistically significantly higher than the midpoint of the measurement scale employed (i.e., 4).

Source: Authors

To assess the bivariate relationships, the study estimated Pearson's correlation coefficient (r) for each pair of variables. The bivariate correlations indicated that PEP was significantly positively correlated with PTI (r = 0.32, p = 0.004) and PCP (r = 0.30, p = 0.005), albeit the relationships were of medium intensity. Nevertheless, PTI was insignificantly associated with PCP (r = 0.15, p = 0.176).

Table 3: Bivariate correlations' matrix (Pearson's r)

		PTI	PEP	PCP
PTI	r	1		
	p	-		
PEP	r	0.32	1	
	p	0.004	-	
PCP	r	0.15	0.30	1
	p	0.176	0.005	-

Note: n = 83.

Source: Authors

Structural Equation Model

Despite its relatively small sample size, the present study employed Covariance Based – Structural Equation Modelling (CB – SEM). The preference shown by existing literature in Partial Least Squares SEM over CB-SEM in studies with smaller sample sizes is primarily based on the former's increased statistical power, ability to obtain meaningful solutions, particularly in the case of examining complex theoretical models, and tendency to retain more indicator items in its solutions (Hair et al., 2017). However, the present research examined a rather simple research model (i.e., with two latent factors and 9 manifest variables) and achieving a satisfactory model fit, did not require the deletion of any indicators. Thus, measurement and structural validity did not appear to have been compromised (Table 1 and Table 4). Overall, considering the proposed model's simplicity (i.e., it involved the estimation of 10 parameters, including latent to indicator variable relationships) and that the ratio of observations per parameter in the present study (i.e., 8.3) exceeded the minimum sample size requirements suggested in the relevant literature

(Jackson, 2003; Kline, 2023), the application of CB-SEM was not deemed problematic.

The structural equation model (Figure 1 and Table 4) had an excellent model fit (Hair et al., 2014) and showed that PTI had a significant and positive effect on PEP (standardized β=0.33) and PEP had a significant and positive effect on PCP (standardized β=0.30). Based on the above, it appeared that, according to female executives' perceptions, higher levels of PTI led to higher levels of PEP, providing support to H_1. Subsequently, higher levels of PEP were associated with higher PCP, and thus H_2 was also supported. Regarding the predictive properties of the structural model, 10.6% of the variance in PEP was explained by PTI, while 8.7% of the variance in PCP was explained by PEP. Both of these relatively low percentages indicated that there were additional factors affecting PEP and PCP that were not included in the model.

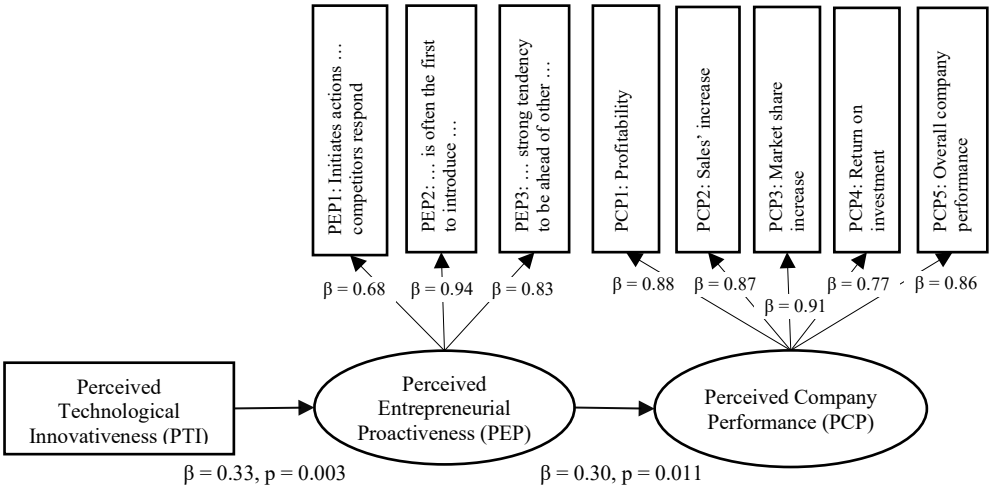
Table 4: Regression weights of the structural model

Outcome Variable		Predictor Variable	Estimate (b)	S.E.	C.R.	p-value	Standardized Estimate (β)	Squared Multiple Correlations
PEP	←	**PTI**	**0.25**	**0.085**	**2.955**	**p = 0.003**	**0.33**	**10.6%**
PCP	←	**PEP**	**0.23**	**0.092**	**2.532**	**p = 0.011**	**0.30**	**8.7%**
PCP1	←	PCP	1.22	0.143	8.537	p < 0.001	0.88	-
PCP2	←	PCP	1.14	0.127	9.026	p < 0.001	0.87	-
PCP3	←	PCP	1.17	0.131	8.952	p < 0.001	0.91	-
PCP4	←	PCP	1.00			p < 0.001	0.77	-
PCP5	←	PCP	1.06	0.103	10.31	p < 0.001	0.86	-
PEP1	←	PEP	0.70	0.105	6.727	p < 0.001	0.68	-
PEP2	←	PEP	1.00			p < 0.001	0.94	-
PEP3	←	PEP	0.81	0.094	8.58	p < 0.001	0.83	-

Notes: (1) n = 83; (2) Model fit statistics: CMIN/DF = 1.032, p = 0.418, CFI = 0.998, TLI = 0.998, RMSEA = 0.020, PCLOSE=0.668, SRMR = 0.049.

Source: Authors

Figure 1: Structural model



Source: Authors

Discussion

Apart from corroborating existing literature about the positive impact of entrepreneurial proactiveness on company performance (Blesa & Ripollés, 2003; Fadda, 2018; Lumpkin & Dess, 2001), the study has several implications regarding the relationship between technological innovativeness and entrepreneurial proactiveness in established and female-led companies. According to female executives' perspectives, when a company is characterized by (or fosters the advancement of) technological innovativeness, it encourages its members to develop creative thinking and focus on opportunity identification. Thus, this proactive approach to technological innovativeness enables the organization to stay ahead of its competitors, adapt to the dynamic environment, exploit opportunities by anticipating future trends, and ultimately, improve its company performance. In other words, and seemingly contrary to the majority of existing literature (Covin et al., 2016; García-Morales et al., 2007; Liem et al., 2019), it appears that the beneficial effects of technological innovativeness on company performance are realized through entrepreneurial proactiveness (Jalali et al., 2022).

These findings may be subject to several interpretations. The establishment of a culture of technological innovativeness, as well as the presence of innovative individuals in companies, may operate as a catalyst for organizational change and improvement in terms of developing a proactive organizational posture (i.e., H_1 of the present study). Subsequently, entrepreneurial proactiveness plays a crucial role in translating innovative ideas into actionable initiatives that impact company performance (i.e. H_2 of the present study). When organizations are entrepreneurially proactive, they are more likely to be market-oriented and, therefore, have a better understanding of customers' needs and preferences. As per the existing literature, this is particularly relevant in companies that are established (Morris & Paul, 1987) and include women in their top management teams (Hunt, Layton, & Prince, 2015), such as those in the present study. Consequently, the innovations being generated are more likely to be relevant and responsive to market demands and lead to better performance outcomes for the business. Essentially, entrepreneurial proactiveness appears to function as a bridge between technological innovativeness and company performance, ensuring that innovative initiatives are effectively translated into products that meet or exceed customer expectations, enhance the organization's competitive position, and ultimately contribute to improved company performance. The abovementioned perspective indicates the importance of not only generating innovative ideas, but also proactively ensuring that these innovations are relevant to market requirements, the latter being a crucial aspect of achieving success in several business contexts.

The study's originality (value) is multifold. The specific focus on the perceptions of female executives is significant, as it sheds light on a segment of the workforce that has been historically underrepresented in entrepreneurial ventures (Rocha & Van Praag, 2020) and corporate leadership positions (Hideg & Shen, 2019). Furthermore, the study's emphasis on established companies with women in their top management teams allows for insights into how technological innovativeness, entrepreneurial proactiveness, and company performance interplay in analogous corporate settings. The positive effect of technological innovativeness on entrepreneurial proactiveness highlights the positive role that technological innovativeness plays in fostering a proactive entrepreneurial mindset within the corporate environment.

This research provides support to the potentially beneficial outcomes of gender diversity in top management and leadership positions (Krishnan & Park, 2005; Smith, Smith, & Verner, 2006), particularly in business sectors, where technological innovation and proactive action are critical success factors. Companies managed by women demonstrate remarkable ingenuity and initiative, defying conventional gender norms. However, certain obstacles continue, such as enduring gender prejudices, which call for the consideration of business owners to create a welcoming and encouraging entrepreneurial environment that promotes the success of female managers. Business organizations are advised to foster a culture of technological innovativeness and entrepreneurial proactiveness to promote growth and enhance their overall economic performance in the long term. The above can be achieved by encouraging cooperation amongst various teams and departments, which will help to exchange knowledge and ideas, resulting in more creative solutions. Managers ought to dismantle organizational silos and provide chances for employees with different backgrounds to collaborate on innovative projects. It is crucial to provide employees with continual opportunities for learning and growth. In this direction, managers should fund training initiatives that develop technical proficiency, encourage an entrepreneurial spirit, and strengthen the organization's capacity for innovation. The cultivation of an entrepreneurial mindset among managers and employees, which (1) encourages experimentation, adoption of new technologies (such as artificial intelligence, automation and digitalization), research and development; (2) rewards employees who exhibit entrepreneurial proactiveness; (3) takes calculated risks and responds to market trends and emerging customer needs, is a critical success factor that all modern companies should aim at. This is particularly important in the face of rapid technological developments, growing uncertainty, changing entrepreneurial contexts, and dynamic markets.

Conclusion

Overall, this study concludes that the successful integration of technological innovativeness and entrepreneurial proactiveness promotes growth and flexibility in dynamic marketplaces, significantly improving a firm's overall performance. The empirical findings offer vital insights to scholars, business practitioners, and policymakers as firms navigate an unprecedented era of technological developments (especially in artificial

intelligence and digital transformation of businesses) and changing entrepreneurial environments. Going forward, promoting sustainable growth and competitiveness in established businesses will require a comprehensive knowledge of the complex relationships between technological innovativeness, entrepreneurial proactiveness, and firm performance. Technological innovativeness and entrepreneurial proactiveness support each other, creating a positive feedback loop in which the benefits of each are amplified. This symbiotic relationship is especially important given the speed at which technology is developing, as organizations need to not only adapt to change, but also take the lead in determining how their sectors will develop in the future. In a corporate environment that is constantly changing, companies that strategically use technology innovation to foster entrepreneurial proactiveness will be better able to manage uncertainty, seize new opportunities, and enjoy long-term success. Furthermore, entrepreneurial proactiveness emerges as a catalyst for improved company performance by identifying opportunities, navigating challenges, taking well-calculated risks, and cultivating a culture of innovation and adaptability. In a constantly shifting marketplace, companies that actively promote and encourage entrepreneurial proactiveness are likely to prosper, not only by attaining short-term victories, but also by setting the basis for enduring and robust long-term performance.

Nonetheless, the limitations of the present research provide fruitful opportunities for further research in this area. Despite the inherent difficulty in finding established companies with female executives in their top management teams, future research efforts could attempt to study larger samples across various sociocultural contexts to enhance the external validity of findings and allow comparisons. Future studies may also assess the proposed model against companies with diverse characteristics (e.g., established vs. new, small vs medium vs large, and female-led vs. male-led) and include additional variables in their analyses (i.e., latent and indicators).

Acknowledgments

The authors would like to thank the reviewers for their constructive and insightful comments in relation to this work.

References

[1] **Antonijević, M., Ljumović, I., & Ivanović, Đ.** (2022). Is there a Gender Gap in Financial Inclusion Worldwide?. *Journal of Women's Entrepreneurship and Education*, (1-2), 79-96. https://doi.org/10.28934/jwee22.12.pp79-96

[2] **Avlonitis, G.J., & Salavou, H.E.** (2007). Entrepreneurial orientation of SMEs, product innovativeness, and performance. *Journal of Business Research*, *60*(5), 566-575. https://doi.org/10.1016/j.jbusres.2007.01.001

[3] **Blesa, A., & Ripollés, M.** (2003). The role of market orientation in the relationship between entrepreneurial proactiveness and performance. *The Journal of Entrepreneurship*, *12*(1), 1-19. https://doi.org/10.1177/097135570301200101

[4] **Brown, J. D.** (2011). Likert items and scales of measurement. *Statistics*, *15*(1), 10-14. https://hosted.jalt.org/test/bro_34.htm

[5] **Covin, J.G., Eggers, F., Kraus, S., Cheng, C.F., & Chang, M.L.** (2016). Marketing-related resources and radical innovativeness in family and non-family firms: A configurational approach. *Journal of Business Research*, *69*(12), 5620-5627. https://doi.org/10.1016/j.jbusres.2016.03.069

[6] **Covin, J.G., & Slevin, D.P.** (1989). Strategic Management of Small Firms in Hostile and Benign Environments. *Strategic Management Journal*, *10*(1), 75-87. https://doi.org/10.1002/smj.4250100107

[7] **Craig, J.B., Pohjola, M., Kraus, S., & Jensen, S.H.** (2014). Exploring relationships among proactiveness, risk-taking and innovation output in family and non-family firms. *Creativity and Innovation Management*, *23*(2), 199-210. https://doi.org/10.1111/caim.12052

[8] **Dess, G.G., & Lumpkin, G.T.** (2005). The role of entrepreneurial orientation in stimulating effective corporate entrepreneurship. *Academy of Management Perspectives*, *19*(1), 147-156. https://doi.org/10.5465/ame.2005.15841975

[9] **Dezső, C.L., Ross, D.G., & Uribe, J.** (2016). Is there an implicit quota on women in top management? A large-sample statistical analysis. *Strategic Management Journal*, *37*(1), 98-115. https://doi.org/10.1002/smj.2461

[10] **Engelen, A., Kube, H., Schmidt, S., & Flatten, T. C.** (2014). Entrepreneurial orientation in turbulent environments: The moderating role of absorptive capacity. *Research Policy*, *43*(8), 1353-1369. https://doi.org/10.1016/j.respol.2014.03.002

[11] **Fadda, N.** (2018). The effects of entrepreneurial orientation dimensions on performance in the tourism sector. *New England Journal of Entrepreneurship*, *21*(1), 22-44. https://doi.org/10.1108/NEJE-03-2018-0004

[12] **García-Morales, V.J., Ruiz-Moreno, A., & Llorens-Montes, F.J.** (2007). Effects of technology absorptive capacity and technology proactivity on

organizational learning, innovation and performance: An empirical examination. *Technology Analysis & Strategic Management*, *19*(4), 527-558. https://doi.org/10.1080/09537320701403540

[13] **Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R. E.** (2014). *Multivariate Data Analysis (7th ed)*. Harlow: Pearson Education Limited.

[14] **Hair, J.F., Matthews, L.M., Matthews, R.L., & Sarstedt, M.** (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107-123. https://doi.org/10.1504/IJMDA.2017.087624

[15] **Hideg, I., & Shen, W.** (2019). Why still so few? A theoretical model of the role of benevolent sexism and career support in the continued underrepresentation of women in leadership positions. *Journal of Leadership & Organizational Studies*, *26*(3), 287-303. https://doi.org/10.1177/1548051819849006

[16] **Hunt, V., Layton, D., & Prince, S.** (2015). Diversity matters. McKinsey & Company, *1*(1), 15-29. https://www.insurance.ca.gov/diversity/41-ISDGBD/GBDExternal/upload/McKinseyDivmatters-201501.pdf

[17] **Ivanović, D., Simović, V., Domazet, I., & Antonijević, M.** (2021). Average Matching Levels for Two DigComp Competence Areas of the Female Entrepreneurs in Serbia. *Journal of Women's Entrepreneurship and Education*, (3-4), 42-60. https://doi.org/10.28934/jwee21.34.pp42-60

[18] **Jackson, D.L.** (2003). Revisiting sample size and number of parameter estimates: Some support for the N: q hypothesis. *Structural Equation Modeling*, *10*(1), 128-141. https://doi.org/10.1207/S15328007SEM1001_6

[19] **Jalali, A., Abhari, S., & Jaafar, M.** (2022). Indirect effect of extra-industry network and innovativeness on performance through proactiveness. *Journal of Facilities Management*, ahead-of-print. https://doi.org/10.1108/JFM-02-2022-0019

[20] **Jeong, S.H., & Harrison, D.A.** (2017). Glass breaking, strategy making, and value creating: Meta-analytic outcomes of women as CEOs and TMT members. *Academy of Management Journal*, *60*(4), 1219-1252. https://doi.org/10.5465/amj.2014.0716

[21] **Kim, H.Y.** (2013). Statistical notes for clinical researchers: assessing normal distribution (2) using skewness and kurtosis. *Restorative Dentistry & Endodontics*, *38*(1), 52-54. https://doi.org/10.5395%2Frde.2013.38.1.52

[22] **Kline, R.B.** (2023). *Principles and Practice of Structural Equation Modeling (5th ed)*. Guilford publications.

[23] **Knapp, T. R.** (1990). Treating ordinal scales as interval scales: an attempt to resolve the controversy. *Nursing Research*, *39*(2), 121-123. https://journals.lww.com/nursingresearchonline/Citation/1990/03000/Treating_Ordinal_Scales_as_Interval_Scales__An.19.aspx

[24] **Knight, G.A., & Cavusgil, S.T.** (2004). Innovation, organizational capabilities, and the born-global firm. *Journal of International Business Studies*, *35*, 124-141. https://doi.org/10.1057/palgrave.jibs.8400071

[25] **Kraus, S., Rigtering, J.C., Hughes, M., & Hosman, V.** (2012). Entrepreneurial orientation and the business performance of SMEs: a quantitative study from the Netherlands. *Review of Managerial Science*, *6*, 161-182. https://doi.org/10.1007/s11846-011-0062-9

[26] **Kreiser, P.M., & Davis, J.** (2010). Entrepreneurial orientation and firm performance: The unique impact of innovativeness, proactiveness, and risk-taking. *Journal of Small Business & Entrepreneurship*, *23*(1), 39-51. https://doi.org/10.1080/08276331.2010.10593472

[27] **Kreiser, P.M., Marino, L.D., Kuratko, D.F., & Weaver, K.M.** (2013). Disaggregating entrepreneurial orientation: the non-linear impact of innovativeness, proactiveness and risk-taking on SME performance. *Small Business Economics*, *40*, 273-291. https://doi.org/10.1007/s11187-012-9460-x

[28] **Krishnan, H. A., & Park, D.** (2005). A few good women—on top management teams. *Journal of Business Research*, *58*(12), 1712-1720. https://doi.org/10.1016/j.jbusres.2004.09.003

[29] **Liem, N.T., Khuong, N.V., & Khanh, T.H.T.** (2019). Firm constraints on the link between proactive innovation, open innovation and firm performance. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(4), 88. https://doi.org/10.3390/joitmc5040088

[30] **Lin, H.C., & Shih, C.T.** (2008). How Executive SHRM System Links to Firm Performance: The Perspectives of Upper Echelon and Competitive Dynamics. *Journal of Management*, *34*(5), 853-881. https://doi.org/10.1177/0149206308318612

[31] **Liu, G., Ko, W.W.J., Ngugi, I., & Takeda, S.** (2017). Proactive entrepreneurial behaviour, market orientation, and innovation outcomes: A study of small-and medium-sized manufacturing firms in the UK. *European Journal of Marketing*, *51*(11/12), 1980-2001. https://doi.org/10.1108/EJM-11-2016-0663

[32] **Livas, C., Theofanidis, F., & Karali, N.** (2023). Consumer sentiment toward international activist advertising. *Innovative Marketing*, *19*(2), 250-260. https://doi.org/10.21511/im.19(2).2023.20

[33] **Luanglath, N., Ali, M., & Mohannak, K.** (2019). Top management team gender diversity and productivity: the role of board gender diversity. *Equality, Diversity and Inclusion: An International Journal*, *38*(1), 71-86. https://doi.org/10.1108/EDI-04-2018-0067

[34] **Lumpkin, G.T., & Dess, G.G.** (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, *21*(1), 135-172. https://doi.org/10.5465/amr.1996.9602161568

[35] **Lumpkin, G.T. & Dess, G.G.** (2001). Linking two dimensions of entrepreneurial orientation to firm performance: The moderating role of environment and industry life cycle. *Journal of Business Venturing*, *16*(5), 429-451. https://doi.org/10.1016/S0883-9026(00)00048-3

[36] **Lyngsie, J., & Foss, N. J.** (2017). The more, the merrier? Women in top-management teams and entrepreneurship in established firms. *Strategic Management Journal*, *38*(3), 487-505. https://doi.org/10.1002/smj.2510

[37] **Moreno-Gómez, J., Lafuente, E., & Vaillant, Y.** (2018). Gender diversity in the board, women's leadership and business performance. *Gender in Management: An International Journal*, *33*(2), 104-122. https://doi.org/10.1108/GM-05-2017-0058

[38] **Morris, M.H., & Paul, G.W.** (1987). The relationship between entrepreneurship and marketing in established firms. *Journal of Business Venturing*, *2*(3), 247-259. https://doi.org/10.1016/0883-9026(87)90012-7

[39] **Muindi, K., & Masurel, E.** (2022). Entrepreneurial Orientation and Entrepreneurial Performance among Female Entrepreneurs: Empirical Evidence from Kenya. *Journal of Women's Entrepreneurship and Education*, (3-4), 7-26. https://doi.org/10.28934/jwee22.34.pp1-26

[40] **Perryman, A.A., Fernando, G.D., & Tripathy, A.** (2016). Do gender differences persist? An examination of gender diversity on firm performance, risk, and executive compensation. *Journal of Business Research*, *69*(2), 579-586. https://doi.org/10.1016/j.jbusres.2015.05.013

[41] **Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., & Podsakoff, N.P.** (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879-903. https://psycnet.apa.org/doi/10.1037/0021-9010.88.5.879

[42] **Post, C., Lokshin, B., & Boone, C.** (2022). What changes after women enter top management teams? A gender-based model of strategic renewal. *Academy of Management Journal*, *65*(1), 273-303. https://doi.org/10.5465/amj.2018.1039

[43] **Rauch, A., Wiklund, J., Lumpkin, G. T., & Frese, M.** (2009). Entrepreneurial orientation and business performance: An assessment of past research and suggestions for the future. *Entrepreneurship Theory and Practice*, *33*(3), 761-787. https://doi.org/10.1111/j.1540-6520.2009.00308.x

[44] **Rocha, V., & Van Praag, M.** (2020). Mind the gap: The role of gender in entrepreneurial career choice and social influence by founders. *Strategic Management Journal*, *41*(5), 841-866. https://doi.org/10.1002/smj.3135

[45] **Sandberg, B.** (2002). Creating the market for disruptive innovation: Market proactiveness at the launch stage. *Journal of Targeting, Measurement and Analysis for Marketing*, *11*, 184-196. https://doi.org/10.1057/palgrave.jt.5740076

[46] **Schillo, R.S.** (2011). Entrepreneurial Orientation and Company Performance: Can the Academic Literature Guide Managers? *Technology Innovation Management Review*, *1*(2), 20-25. https://timreview.ca/sites/default/files/article_PDF/Schillo_TIMReview_November2011.pdf

[47] **Shamaki, H., Ibrahim, U. A., & Philemon, N. A.** (2022). Evaluating the Influence of Digital Technology on the Performance of Female-Owned Enterprises in Nigeria. *Journal of Women's Entrepreneurship and Education*, (1-2), 39-60. https://doi.org/10.28934/jwee22.12.pp39-60

[48] **Simovic, V., Theofanidis, F., Antonijevic, M., Rahat, M. & Nissi**, **Y.** (2024). The differences in perceptions of continuous intention to use mobile banking apps: Evidence from Kuwait and Serbia. In *Convergence of Digitalization, Innovation, and Sustainable Development in Business*, Editors: Erturk, A., Colbran S., Coskun, E. Theofanidis, F. and Abidi, IGI Global, ISBN13: 9798369307984, EISBN13: 9798369307991.

[49] **Smith, N., Smith, V., & Verner, M.** (2006). Do women in top management affect firm performance? A panel study of 2,500 Danish firms. *International Journal of Productivity and Performance Management*, *55*(7), 569-593. https://doi.org/10.1108/17410400610702160

[50] **Stainback, K., Kleiner, S., & Skaggs, S.** (2016). Women in power: Undoing or redoing the gendered organization?. *Gender & Society*, *30*(1), 109-135. https://doi.org/10.1177/0891243215602906

[51] **Su, Z., Xie, E., & Li, Y.** (2011). Entrepreneurial orientation and firm performance in new ventures and established firms. *Journal of Small Business Management*, *49*(4), 558-577. https://doi.org/10.1111/j.1540-627X.2011.00336.x

[52] **Talke, K., Salomo, S., & Kock, A.** (2011). Top management team diversity and strategic innovation orientation: The relationship and consequences for innovativeness and performance. *Journal of Product Innovation Management*, *28*(6), 819-832. https://doi.org/10.1111/j.1540-5885.2011.00851.x

[53] **Theofanidis, F. & Livas, C.** (2007). The Battle of Marathon: Strategic STP in Ancient and Modern Greece – A Case Study. *Innovative Marketing*, *3*(4), 95-106.

Article history: Received: January 7th, 2024

Accepted: April 1th, 2024

DOI: 10.28934/jwee24.12.pp227-247
JEL: L26

ORIGINAL SCIENTIFIC PAPER

Women Entrepreneurship Development During COVID-19 Pandemic: Perspectives Based on Framing Effect Theory

Godswill Agu [1]
Abia State University, Nigeria, Faculty of Economics and Management Sciences, Department of Marketing, P.M.B 2000, Uturu, Abia State
Ihuoma Godswill [2]
Imo State University, Nigeria, Faculty of Social Sciences, Department of Economics, P.M.B 2000, Owerri Imo State
Aidin Salamzadeh [3]
Faculty of Management, University of Tehran, Iran

A B S T R A C T

Little research attention has been drawn to the negative versus positive effects of the novel COVID-19 pandemic on women-led enterprises. The Nigerian context that focuses on women of the most renowned entrepreneurial ethnic group in Sub-Saharan Africa has not been explored in the academic literature. This study explores the perceived effects of the novel COVID-19 pandemic on women entrepreneurship development in Nigeria by focusing on Igbo women entrepreneurs. A qualitative survey involving in-depth interviews of 28 nascent and established Igbo women entrepreneurs was conducted. Leveraging the Framing Effect Theory, thematic analysis was performed on the collected data. Findings indicate that the COVID-19 pandemic had both negative (loss of revenues, difficulty in repaying ongoing loans, damage of goods in the store, and inability to meet set growth targets) and positive (innovativeness, entrepreneurship

[1] Corresponding author, e-mail: godswill.agu@abiastateuniversity.edu.ng
[2] E-mail: ihugodswill@gmail.com
[3] E-mail: salamzadeh@ut.ac.ir

opportunities, fulfilling entrepreneurship ambition, and digitization of entrepreneurship) effects on Igbo women-owned enterprises in Southeast Nigeria. However, contrary to previous research, nascent entrepreneurs are more positively impacted by the COVID-19 pandemic than experienced/established entrepreneurs. The study, thus, contributes to theory and practice by providing insightful directions for policymaking on women entrepreneurship development during economic crisis.

KEYWORDS: *COVID-19 pandemic, entrepreneurship development, framing effect theory, thematic analysis, women entrepreneurship, Igbo Women, Nigeria, Southeast*

Introduction

The emergence of the novel COVID-19 pandemic brought the global economy to an abrupt standstill. Economic activities and other aspects of life endeavor experienced their worst shock – one that has never been witnessed since the World War II of 1939 to 1945. Thus, the world economy entered its worst recession since the Second World War as a result of lockdowns and other efforts by governments around the globe to stop the virus from spreading. (Gopinath, 2020; Agu et al., 2022). Globally, COVID-19-related economic losses were projected to be $8.5 trillion over the following two years (United Nations, 2020), and a decline in the world GDP of over $4 trillion between 2020 and 2021 (United Nations Conference on Trade and Development, 2021).

Because of the pro-health but anti-economic measures taken to protect lives, the global economy sharply nosedived in a negative direction. Nigeria, like other economies in Africa, experienced its own losses associated with the novel COVID-19. In fact, according to Lian and Vishwanath (2021:1), "many of the primary effects of the COVID-19 crisis on Nigeria have been economic, rather than health-related". For instance, the National Bureau of Statistics (NBS, 2022) indicates that the COVID-19 pandemic in 2020 resulted in the loss of jobs for 20 percent of Nigeria's full-time workforce. The report thus indicates that in 2020, Nigeria's unemployment rate reached a record high of 33.3 percent, ranking third globally after South Africa and Namibia at 34.4 and 33.4 percent, respectively.

Nigeria experienced its worst recession since the 1980s during the early stages of the COVID-19 pandemic, with the industrial and services sectors being most severely affected (World Bank, 2021). The report also indicates

that between February and May 2020, there was a more than 60% decline in the price of oil, which accounts for over 50% of government revenue and over 80% of Nigeria's exports. From the entrepreneurial angle, the micro, small, and medium-scale enterprises sector will never forget the negative experiences of the COVID-19 pandemic in a hurry. According to Shafi et al. (2020) in Agu et al. (2022), micro, small, and medium-sized enterprises (MSMEs), which faced a number of problems such as financial setbacks, supply chain interruptions, a decline in demand, and a drop in sales and profit, remain the main victims of the COVID-19 outbreak. As a result of the partial and complete lockdowns and limits on movement, the majority of entrepreneurs were impacted by the COVID-19 pandemic, both significantly and slightly (Abioye et al., 2022). Of particular interest to this study is the negative effect of the pandemic on women-led enterprises in developing economies such as Nigeria (McEchern, 2021; Global Entrepreneurship Monitor, 2022; Torres et al., 2021).

However, this paper proposes that the COVID-19 pandemic forms an entrepreneurship proverbial two-edged sword, in this case, having both positive and negative effects on Nigerian entrepreneurship development. This was mentioned by previous scholars who assert that pieces of evidence abound globally of some positive effects of the pandemic on entrepreneurship education, idea generation, new venture development and vocational skills acquisition for entrepreneurship development (e.g., Agu et al., 2022; Coad et al., 2022; Sörensson & Ghannad, 2023; Elena et al., 2021; Silvia et al., 2020). Although scholarly pieces of evidence abound that support the argument that the COVID-19 pandemic was not an all-negative monster on the Nigerian and global economy, especially from the entrepreneurship perspective (e.g., Muzaffa, 2023; Anggadwita et al., 2023; Mustafa et al., 2021), yet scanty research attention has been drawn to the positive aspects of the pandemic on women-led enterprises in the context of Nigeria.

Therefore, the study adopts the Framing Effect Theory (FET) which describes situations where various accounts of the same event lead to diverse responses (Kühberger, 1998) and in which a positive or negative format is used to frame or convey the same decision problem (Peters et al., 2011). Thus, the study seeks to shed some light on the negative versus positive entrepreneurial effects of the novel COVID-19 pandemic on the Nigerian economy by leveraging the lived experiences of women-led micro nascent (COVID-19-prompted) and experienced/existing (pre-COVID-19

established) entrepreneurs. Within the context of Southeast Nigeria – a globally acclaimed entrepreneurial ethnic region, inhabited primarily by the Igbos (Agu et al., 2022; Ekesiobi & Dimnwobi, 2021; Agu & Nwachukwu, 2020; Igwe et al., 2018; Adeola, 2021), this research direction is yet to be explored.

To actualize the study objective, two research questions provided the basis for the study:

RQ1. What are the negative effects of the COVID-19 pandemic on established and nascent women entrepreneurs in Southeast Nigeria?

RQ2. What are the positive effects of the COVID-19 pandemic on established and nascent women entrepreneurs in Southeast Nigeria?

The rest of the study is structured as follows: section two reviews relevant literature on the COVID-19 pandemic, women entrepreneurship development and the FET. In the third section, detailed explanations of the methodology guiding the study are provided, while the fourth section shows the results of data analysis. The fifth section discusses the findings and concludes by highlighting the practical and theoretical contributions of the study as well as directions for future studies.

Literature Review and Theoretical Framework

COVID-19 Pandemic and Entrepreneurship Development

A pandemic brought on by the new coronavirus SARS-CoV2 began more than three years ago, and it has completely altered the way we work and live. The World Health Organization (WHO, 2020) describes coronavirus sickness as an infectious illness brought on by a recently identified coronavirus. The symptoms caused by this vast family of viruses range from the common cold to acute respiratory tract infections, which can result in pneumonia, acute respiratory syndrome, and fatality (Kani et al., 2020). Being a highly contagious illness, it has put the world's public health at risk due to its high infection transmission rate and increased mortality rate among the elderly, those with weakened immune systems, and patients with coexisting medical disorders (Mueller *et al.,* 2020). The world had previously encountered coronaviruses before the COVID-19 pandemic

(Inegbedion, 2021). Two notable cases are the Middle-East Respiratory Syndrome (MARS), which struck several Middle Eastern nations in 2012, and the Severe Acute Respiratory Syndrome (SARS), which struck China in 2002 and 2003 (Zhong et al., 2003). However, prior coronaviruses did not have catastrophic effects; in fact, the total number of SARS and MERS illnesses was 8492 (Zhu et al., 2020). COVID-19, which originated in China in 2019, had 6,908,165 fatal cases as of August 16, 2023 (Worldometer, 2023).

The Organization for Economic Co-operation and Development (OECD) (1997) defines entrepreneurship as the dynamic process of spotting business possibilities and seizing them by creating, manufacturing, and distributing goods and services. While citing Chowdhury, 2017, Dhar et al. (2022) see an entrepreneur as a person "who builds an enterprise with independence, motivation and diligence and has the initiative to start a business with creativity and innovation." Thus, a creative and perceptive individual who scans the economic horizon and uses information and knowledge to pursue profit is seen as an entrepreneur (African Development Report, 2011). While several definitions of entrepreneurship development exist in the literature, the definition of the African Development Report (2011:2) is reproduced here:

"Entrepreneurship development is the process of enhancing entrepreneurial skills and knowledge through structured training and institution-building programs. It aims to enlarge the base of entrepreneurs to speed up the pace at which new ventures are created. The focus is on the individual who wishes to start or expand a business, with concentration on growth potential and innovation."

Entrepreneurship development intention formation has been described as a progression that takes place gradually and consists of increasing degrees of entrepreneurial engagement, including a propensity for or latent entrepreneurship, commitment to entrepreneurship, and nascent entrepreneurship (Vamvaka et al., 2020). The nascent entrepreneur grows into an experienced/established entrepreneur.

Whether the COVID-19 pandemic, beyond its negative effects, has made any positive contribution in enhancing entrepreneurial mindset, skills, and knowledge required for entrepreneurial start-ups for budding entrepreneurs and innovative growth for experienced entrepreneurs, deserves scholarly attention.

In a study involving 303 entrepreneurs, Xu and Jia (2022) investigated the impact of COVID-19 on the psychological well-being (PWB) of entrepreneurs in China. The findings of the research confirm the detrimental effects of the pandemic on entrepreneurship, including actual and potential resource losses, a decline in the value that human capital can offer, and increased challenges in acquiring new resources. In a mixed study carried out by Engidaw (2022), findings show that many small and large businesses faced COVID-19-induced challenges, such as reduced revenue and weak marketing performance. Bartik et al. (2020) in a study of about 6000 small businesses, found that the pandemic caused 43% of the businesses to temporarily be closed, some had reductions in employees, while others faced a cash crunch. A theoretical and empirical study by Otrachshenko et al. (2022) looked at how the pandemic affected people's aspirations to enter and leave the business world in relation to learning new skills and growing financial concerns. Acquiring new skills during the pandemic aided business owners in maintaining their current operations and stimulated the establishment of new ventures outside the information technology (IT) sector, according to the findings. Ratten and Jones (2021) disclosed that COVID-19 could be a transformational opportunity for entrepreneurship education research due to the new thought processes raised by the pandemic. A Nigerian-focused study by Uwajumogu et al. (2022) found negative aspects of the pandemic on entrepreneurship. These include growth contraction, which has an impact on investment levels, asset prices, expectations of future income, particularly for small and informal enterprises, and aggregate demand. They also found, however, that the Pandemic presented some utilized, unutilized, and partially utilized opportunities for entrepreneurship. Agu et al. (2022) examined and contextualized the planned entrepreneurial behavior and the Igbo Traditional Business School (ITBS) in the Nigerian higher education sector during a crisis brought on by the COVID-19 epidemic. According to the study, the COVID-19 pandemic negatively impacted students' attitudes, subjective norms, perceived behavioral control (PBC), and entrepreneurial intention (EI). However, the ITBS, which is a special entrepreneurship education, mitigated the negative effects of the pandemic on entrepreneurship by attracting greater enrolment of individuals who were seeking entrepreneurial and vocational skills.

Cera et al. (2022)'s study which involved 800 participants found that the COVID-19 pandemic, when viewed as an opportunity, favorably affects

both the antecedents of entrepreneurial intention and people's intention to launch a firm.

More specifically, several studies devoted to COVID-19 and women entrepreneurship also affirm this positive versus negative effects relationship (Anggadwita et al., 2023; Mustafa et al., 2021; Muzaffar, 2023; Sörensson & Ghannad, 2023; Sanja et al., 2020; Elena et al., 2021; Lazic et al., 2021). According to Elena et al. (2021), the capacity to build and maintain social contacts (networking), concentrate on the social significance of business, exercise flexibility when making new decisions, and prioritize learning are all necessary for women entrepreneurs to successfully adjust to the COVID-19 problem and any other economic crisis.

Theoretical Framework: Framing Effect Theory

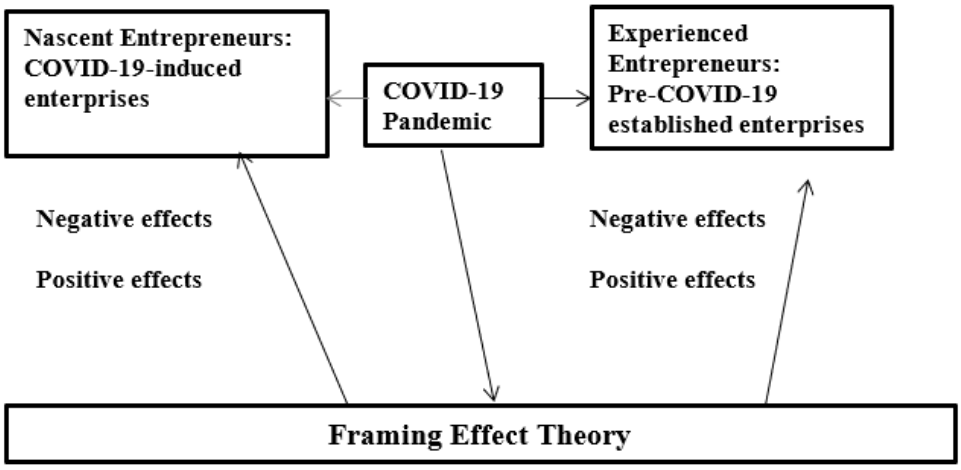
The framing effect in psychology refers to the bias where people react differently to a particular decision depending on how it's presented or "framed", emphasizing either the positive (gain) or negative (loss) aspects (Perera, 2023). The origin of the theory originated with a 1981 study by Amos Tversky and Daniel Kahneman, who examined how different ways to phrase the same information affected participants' reactions to a hypothetical life-and-death situation (Tversky & Kahneman, 1985). From the medical perspective, when making decisions about medical care, a medical professional may be influenced by their emotional states as a result of the way they have framed the information. This cognitive bias is known as the framing effect (Kahlili et al., 2020).

Here, the Framing Effect Theory is applied to explore entrepreneurs' perception (cognitive bias) of the effect of the COVID-19 pandemic based on how it affected their enterprises as well as the way the situation was handled in their country, for instance, Nigeria.

The COVID-19 pandemic has the potential to impact people's behavior in both positive and negative ways, including their inclination to become entrepreneurs and other facets of entrepreneurship. While noticeable research efforts have been made on the negative impact of the pandemic on entrepreneurship, very few studies have outlined the positive effect of the pandemic on entrepreneurship development. Yet, no study has been found that took a qualitative perspective, showing both the negative and positive effects of the pandemic on entrepreneurship in Nigeria. Besides, most of the studies were on intentions, not actual behaviors, as they covered intending entrepreneurs, but the present study is on existing entrepreneurs. By

leveraging our proposed conceptual framework in Figure 1, this study addresses this research gap.

Figure 1: Conceptual framework of the study



Source: Authors

Methodology

This study is mainly qualitative as it uses phone and face-to-face interviews to generate data from a cross-section of registered women-led MSMEs in three of the five Southeastern States - Abia, Imo, and Anambra. The participants were divided into two based on when their enterprises were registered or started (pre-COVID-19, also known as experienced entrepreneurs, or during/post-COVID-19 also known here as nascent or budding entrepreneurs). To be qualified for the interview, the entrepreneur must have a formalized or registered business with the Corporate Affairs Commission (CAC) and must be a woman. By using the contacts of the researchers, qualified subjects were identified and emails and phone calls were made to request the owner-managers' voluntary participation in the interview. Thereafter, either phone or face-to-face interviews were held depending on the participants' preferred mode.

The interview process was guided by the following questions (interview protocol):

- How long have you been in this business?
- Did the COVID-19 pandemic have any effect on your business?

- What negative effects did the COVID-19 pandemic have on your business?
- What positive effects did the COVID-19 pandemic have on your business?

A total of 28 participants were involved in the interview, and this number was enough to generate data saturation – the point when gathering of further data became unnecessary, as that might lead to redundancy of data (Agu et al., 2023). Each interview lasted between 30 and 62 minutes and participants were informed that their identity would not be disclosed. The interview protocol and process were approved by the lead author's Ethics and Research Publications Unit with the number: FEMS/2023/007. Data were collected in English, recorded at the permission of the respondents, and transcribed verbatim immediately after collection.

A thematic analysis based on the deductive approach was applied for data analysis, while few quotes were captured to show how participants responded. The deductive approach is appropriate in this context since it developes themes based on a pre-defined code list resulting from literature review insights and the underpinning theory (Kaya, 2021). Few participants were re-contacted after the analysis to re-affirm their responses, thus establishing the validity of the data (Madichie & Agu, 2022).

Results and Discussions

In the study sample, all participants, representing 100 percent are females. 17 participants (or 60.71 percent) are sole founders of their enterprises, while 11 (or 39.29 percent) are co-founders. All the participants have higher education degrees, with 10 (35.71 percent) having first degree only, 14 (50.00 percent) having master's degrees, and 4 (14.29 percent) participants with doctoral degrees. 21 (75 percent) participants are in the age bracket of 30-50 years, while 7 (25 percent) are above 50. All the participants are married. 13 (46.43 percent) are COVID-19-induced entrepreneurs, while 15 (53.57 percent) are established pre-COVID-19. Table 1 depicts the demographics of participants.

Table 1: Demographic Analysis of the Respondents

Variable	Frequency	Percentage
Gender:		
Female	28	100
Type of ownership:		
Sole founder	17	60.71
Co-founder	11	39.29
Educational Qualification:		
First degree	10	35.71
Masters degree	14	50.00
Doctoral degree	4	14.29
Age bracket:		
30-50 years	21	75.00
Above 50 years	7	25.00
Marital status:		
Married	18	100.00
Age of Business:		
Less than 4 years	13	46.43
Above 4 years	15	53.57

Source: Authors' own compilation, 2023

Negative Effects of the Pandemic on Entrepreneurs

Emerging themes in this section include loss of revenues, difficulty in repaying ongoing loans, damage of goods in the store, and inability to meet set growth targets. Women, especially experienced entrepreneurs identified loss of revenue arising from several months of business closure as the overriding negative effect of the pandemic on their entrepreneurial pursuit. A few nascent entrepreneurs also believed that a combination of both physical and online modes of transaction would enhance their daily sales. However, the restriction of movements denied them the sales that would have accrued from the physical stores. One of the participants noted:

> "I will not forget the COVID-19 experience in a hurry. I have never lost the kind of revenue I lost during the lockdown before in my many years of running this business" (Joy).

Loss of revenue by entrepreneurs during the pandemic period aligns with the findings of Xu and Jia (2022) that entrepreneurs experienced resource loss and resource shortage during the COVID-19 pandemic.

Engidaw (2022) noted that given the outbreak of the COVID-19 epidemic, micro firms are finding it difficult to survive with their decreased revenue.

Another emerging theme, mostly among established entrepreneurs, is the "inability to meet loan repayment terms" given the paucity of sales and profit. Similar to this is the nascent entrepreneurs' inability to access loan facilities to scale up their operations. Thus, financial difficulty in servicing and accessing loans was a negative experience brought about by the pandemic on women entrepreneurs:

> "Even though I was no longer selling my products to generate more funds, my bank was still collecting my money to service the loan I took from them" (Uchechi).

Indeed, previous studies show that the pandemic significantly and negatively impacted small and medium-sized business funding, made entrepreneurs' financial situation more precarious, and restricted their ability to obtain financing (Yao & Liu, 2023; Gur et al., 2023).

Again, most experienced entrepreneurs complained of witnessing damage to goods in their stores and warehouses. A small number of nascent entrepreneurs also experienced this challenge. Prior to the outbreak of the pandemic and the lockdown that followed, the women entrepreneurs revealed that they had set their annual business goals and targets for growth and expansion. However, the goals were truncated by the pandemic.

> "Brother, don't remind me of the COVID-19 experience. I really suffered. Thank God I survived it and my business is back again. Sir, my goods worth about 2 Million Naira (#2, 000000) were damaged before the movement restriction was lifted" (Helen).

Bartik et al. (2020) disclosed that female small business owners were likely to experience business losses as a result of the pandemic. Corroborating this, Uwajumogu et al. (2022) noted that the COVID-19 pandemic affected asset values, investment levels, and expectations of future revenue, particularly for small and informal enterprises.

Positive Effects of the Pandemic on Entrepreneurs

The themes suggesting that the pandemic impacted positively on entrepreneurship include innovativeness, entrepreneurship opportunities, fulfilling entrepreneurship ambition, and digitization of entrepreneurship.

Innovation is an inevitable competitive pathway for entrepreneurs. According to Agu et al. (2023b), innovation implies new product planning, development, and commercialization. That is, introducing new products to the market. However, many entrepreneurs undermine innovation (Kirsner, 2013). With the COVID-19 pandemic disruptions, our sample women entrepreneurs, both experienced and nascent entrepreneurs, revealed various innovative strides they embarked upon as business survival strategies. For instance, all the experienced entrepreneurs affirmed that they leveraged the available digital platforms such as WhatsApp, Facebook, and X among others to keep in touch with their customers. The nascent entrepreneurs disclosed that they were exposed to innovative business ideas which were created by the pandemic. Besides, all the participants disclosed that the pandemic opened their eyes to the need to integrate digitization into their entrepreneurial ventures.

> "The COVID era helped me to think out new aspects of business. For instance, I improved my relationship with my customers since there was restriction of movement; I was communicating with them more through WhatsApp instead of waiting to see them" (Sunday, Male).

Extant literature supports that the COVID-19 pandemic pushed entrepreneurs into adopting innovative/digital business approaches, including the creation of new offerings, new markets, new pricing, distribution, and promotion strategies (Modgil et al., 2022; Valdez-Juárez et al., 2022). Particularly, Santos et al. (2023) reported that new digital technologies have changed the face of entrepreneurship and helped many existing and start-up businesses stay afloat during the COVID-19 pandemic. Thus, in light of the COVID-19 experience, entrepreneurs are prepared to accept additional digital entrepreneurial endeavors and digitalization support services (Alanzi & Ratten, 2023; Ratten & Jones, 2022).

Furthermore, the COVID-19 pandemic, as reported by the women entrepreneurs, created entrepreneurial opportunities and pushed intending entrepreneurs into business start-ups, thus, helping women to fulfill their entrepreneurial ambitions.

> "I was able to commence an online consulting service for academic research since my employer was no longer paying me. Today, this online business is growing impressively" (Olachi).

> "Before the COVID-19 lockdown, I was working in a company where I was paid #30,000 as salary. But I lost my job as a result of the pandemic. My husband and I dropped our shame and commenced this business (micro restaurant). Today, Sir, I pay myself more than twice that salary every month" (Doris)
>
> "I learned the skills that helped me establish this business during the COVID pandemic" (Jacinta)

These findings are in tandem with previous studies highlighting the positive role of COVID-19 on entrepreneurship. For instance, in a cross-country study involving 800 respondents, Cera et al. (2022) found that the COVID-19 pandemic, when viewed as an opportunity, has a favorable impact on people's intentions to start a business as well as the antecedents of entrepreneurial intention. Similarly, Agu et al. (2022) reported how the COVID-19 pandemic motivated university students to enroll in an informal entrepreneurship education scheme, thereby equipping them with the necessary skills to set up new ventures.

In Tables 2 and 3, we present the coded thematic form arising from the data.

Table 2: Coded Thematic Frames of Negative Effects of the COVID-19 Pandemic on Entrepreneurship Development

Themes	Description	Emerging Subthemes
Negative Effects of the COVID-19 pandemic on Entrepreneurship	Challenges occasioned by the COVID-19 pandemic which hindered the growth of entrepreneurship and enterprises.	– Loss of revenues – Difficulty in repaying ongoing loans – Damage to goods in the store – Inability to meet set growth targets.

Source: Authors' own compilation (2023)

Table 3: Coded Thematic Frames of Positive Effects of the COVID-19 Pandemic on Entrepreneurship Development

Themes	Description	Emerging Subthemes
Positive Effects of the COVID-19 on Entrepreneurship	Opportunities and gains occasioned by the COVID-19 pandemic which enabled the growth of entrepreneurship and enterprises.	– Innovativeness – Entrepreneurship – Opportunities – Fulfilling entrepreneurship ambition – Digitization of entrepreneurship

Source: Authors' own compilation (2023)

Conclusions and Recommendations

This study attempted to explore the effects of the COVID-19 pandemic on women entrepreneurship in Nigeria. In doing this, the Framing Effect Theory was adopted to unravel the negative and positive effects of the pandemic on entrepreneurship growth and development. Findings affirm the applicability and relevance of the theory in understanding the effects of economic crisis on women entrepreneurship. While several challenges were brought about by the pandemic which hindered the growth of women entrepreneurship, the pandemic, no doubt, created several opportunities that have positively affected women entrepreneurship in Nigeria. More specifically, the nascent entrepreneurs reported more positive effects of the COVID-19 pandemic on entrepreneurship development than the experienced entrepreneurs. This is unlike Emami et al. (2019) who disclosed in their study that experienced entrepreneurs showed lesser tendencies towards negative responses emanating from the COVID-19 pandemic. This finding further justifies the peculiarity of the interaction between the COVID-19 pandemic and entrepreneurship development (Cera et al., 2022), thus deserving further research.

Again, the findings support extant studies on the resilient, innovative, and risk-management ability of Igbo entrepreneurs (Agu & Nwachukwu, 2020; Igwe et al., 2018; Adeola, 2021; Agu et al., 2022). Thus, despite the globally-acknowledged negative effects of the novel COVID-19 pandemic, both the nascent and experienced Igbo women entrepreneurs identified new

entrepreneurial opportunities which they tapped into and which are greatly supporting their growth in the post-COVID-19 era.

The study contributes to the global literature in three major dimensions. First, it moves beyond the literal, all-known negative consequences of the novel COVID-19 pandemic to unravel some hidden positive aspects of the crisis among women of Nigeria's most celebrated resilient entrepreneurs – people of the Southeast (Igbos). Igbos are known for their entrepreneurial pathways and have made significant contributions to global entrepreneurship through their resilient spirit, risk-taking/management skills, perseverance, and innovativeness. The knowledge of these positive aspects is necessary for policymaking during an economic crisis, especially in supporting women-led enterprises to sustain their businesses during and after an economic crisis. Thus, it emphasizes the need for economic crisis responses that consider the negative and positive aspects of any economic crisis, such as the COVID-19 pandemic, in supporting women entrepreneurs during crisis periods. Furthermore, since little research attention has been given to women entrepreneurship in emerging nations such as Nigeria (Khan et al., 2021), this study adds to the literature in this direction.

Secondly, we contribute to theory by demonstrating and supporting the applicability of the Framing Effect Theory to entrepreneurship research. Thus, unlike previous research that disclosed that experienced (here, pre-COVID-19 established entrepreneurs) showed lesser tendencies toward negative responses, this study presents a special case where the reverse is the case. Thirdly, the study agitates further interest regarding global research on the COVID-19 pandemic and women entrepreneurship by presenting a framework from the context of the emerging African economy which might be applied to other contexts. Thus, it responds to the call for more research on women entrepreneurship from the context of emerging economies which has received very little scholarly attention (Cardella et al., 2021; Raheed & Ratten, 2020), thereby contextualizing the COVID-19 pandemic's effects on businesses run by women (Muzaffa, 2023; Anggadwita et al., 2023).

Practically, the study has social implications. To tap from these practical gains of the study, the following are recommended to policymakers for sustainable national development even in times of economic crisis and in providing support to women entrepreneurs:

The study shows that during an economic crisis, governments and policymakers are required to put an eye on the negative and positive aspects of the crisis, and not just only on the negative. This will help to carefully

deploy economic interventions and assistance inclusively to all entrepreneurs. Every crisis has both positive and negative aspects, and so does the COVID-19 pandemic on entrepreneurship. Therefore, proactive actions that can ameliorate economic challenges and uphold the positive aspects should be put in place by the government. Further assistants by the government are required to solidify the rebounding of older enterprises affected by the pandemic and to help the nascent, pandemic-induced enterprises grow. More specifically, the newly elected Nigerian government is encouraged to put entrepreneurship development at the center of any economic decisions or policies. For instance, the Naira redesign experience, the Central Bank of Nigeria's new foreign exchange rules, and the sudden removal of the petrol subsidy have drawn several enterprises back to the struggling stage. Any policy that stifles entrepreneurship has invariably announced the collapse of the nation.

More importantly, the findings of this research call for the deepening of interventions on women entrepreneurship by establishing special initiatives and schemes meant solely for this group. This will accelerate women's access to government support and also improve inclusiveness in meeting national economic development.

To take this study further, there is a need for studies that can take pure quantitative or mixed approaches, and which can cover other zones/ethnic groups of the country.

References

[1] **Adeola, G.** (2021). Indigenous African enterprise: the Igbo Traditional Business School (I-TBS). *Advanced Series In Management, 26*, Emerald Publishing Limited.

[2] **African Development Report**. (2011). *Entrepreneurship development*. www.afdb.org

[3] **Agu, G. A., Okwara, O.O., Okocha, E.R., & Madichie, N.O.** (2022). COVID-19 pandemic and entrepreneurial intention among university students: a contextualisation of the Igbo Traditional Business School. *African Journal of Economic and Management Studies*, *13*(1), 89-104.

[4] **Agu, G.A., Okereafor, G. E., Omotosho, D.T., Okocha, E.R., & Uche, D.B.** (2023)**.** Drivers of religious entrepreneurial behaviour among Pentecostal pastors: push-pull-mooring theory and theory of planned behaviour. *Small Enterprise Research*, *30*(3), 275-300. https://doi.org/10.1080/13215906.2023.2231408

[5] **Agu, G.A., Ogbuji, C.N. & Okpara, G.S.** (2023b). Product Management and Business Policy: Marketing approach. Gandic Universal Services: Owerri.

[6] **Alanzi, S. & Ratten, V.** (2023). The use of technology in facing the COVID-19 negative consequences and the associated opportunity for digital entrepreneurship in KSA", Journal of Trade Science, 11 (2/3), 31-44. https://doi.org/10.1108/JTS-06-2023-0002

[7] **Anggadwita, G., Indarti, N., & Ratten, V.** (2023). Women entrepreneurs in the craft industry: a case study of the batik industry during the COVID-19 pandemic. *International Journal of Sociology and Social Policy*, *43*(11/12), 1029-1046. https://doi.org/10.1108/IJSSP-12-2022-0305

[8] **Bartik, A. W., Bertrand, M., Cullen, Z. B., Glaeser, E. L., Luca, M., & Stanton, C. T.** (2020). How are small businesses adjusting to COVID-19? Early Evidence from a Survey. *NBER Working Paper No. w26989.*

[9] **Cera, G., Ndoka, M., Dika, I., & Cera, E.** (2022). Examining the impact of COVID-19 on entrepreneurial intention through a stimulus–organism–response perspective. *Administrative. Sciences*, *12*(4), 184. https://doi.org/10.3390/admsci12040184

[10] **Coad, A., Amaral-Garcia, S., Bauer, P., Domnick, C., Harasztosi, P., Pál, R. & Teruel, M.** (2022). Investment expectations by vulnerable European firms in times of COVID. *Eurasian Business Review*, *13*(1), 28, https://doi.org/10.1007/s40821-022-00218-z

[11] **Dhar, S., Farzana, T., & Abedin, S. S. I.** (2022). Pushed or pulled into entrepreneurship? Motivations behind entrepreneurial entry for Women with disabilities in Bangladesh. *Journal of Women's Entrepreneurship and Education*, (3-4), 103-125.

[12] **Elena, S., Olga, B. & Olga, G.** (2021). Women entrepreneurship in the time of COVID-19 pandemic: Opportunities and risks. *Journal of Women's entrepreneurship and Education,* (1-2), 70-83.

[13] **Emami, A., Welsh, D.H.B., Ramadani, V., & Davari, A.** (2019). The impact of judgment and framing in entrepreneurs' decision making. *Journal of Small Business & Entrepreneurship*. https://doi.org/10.1080/08276331.2018.1551461

[14] **Engidaw, A.E.** (2022)**.** Small businesses and their challenges during COVID-19 pandemic in developing countries: in the case of Ethiopia. *Journal of Innovation and Entrepreneurship, 11*(1). https://doi.org/10.1186/s13731-021-00191-3

[15] Gopinath**, G.** (2020). *The great lockdown: Worst economic downturn since the great depression*. www.imf.org

[16] **Gur, N., Babacan, M., Aysan, A.F. and Suleyman, S**. (2023). Firm size and financing behavior during COVID-19 pandemic: Evidence from SMEs

in Istanbul, *Borsa Istanbul Review, 23(4),* 804-817. https://doi.org/10.1016/j.bir.2023.02.001

[17] **Igwe, P. A., Newbery, R., Amoncar, N., White, G. R.T. & Madichie, N. O.** (2018) Keeping it in the family: Exploring Igbo ethnic entrepreneurial behaviour in Nigeria. *International Journal of Entrepreneurial Behaviour & Research, 26*(1), 34-53.

[18] **Inegbedion, H.** (2021). Impact of COVID-19 on economic growth in Nigeria: opinions and attitudes. Heliyon. *7*(5), e06943. https://doi.org/10.1016/j.*Heliyon*

[19] **Kani, R., Alexander, A., Nayak, P.G., Mudgal., J., & Nandakumar, K.** (2020). COVID-19: Emergence, spread, possible treatments, and global burden. *Frontier Public Health*, 8. https://doi.org/10.3389/fpubh.2020.00216

[20] **Kaya, H. D.** (2021). Do Business-Friendly States Attract Female Entrepreneurs?. *Journal of Women's Entrepreneurship and Education*, (3-4), 1-21.

[21] **Khalil, R.B., Sleilaty, G., El-Khoury, J. & Nemr, E.** (2020). Teaching the use of framing and decontextualization to address context-based bias in psychiatry, *Asian Journal of Psychiatry*, *54*, 102276

[22] **Kühberger, A.** (1998). The influence of framing on risky decisions: a Meta-analysis. *Organizational Behaviour and Human Decision Process, 75*(1), 23-55.

[23] **Kirsner, S**. (2013). 11 Ways Big Companies Undermine Innovation. *Harvard Business Review*. www.hbr.org

[24] **Lazic, M., Jovanovic, O., & Marija, L.M**. (2021). Women's entrepreneurship in the wake of COVID-19 crisis. *Journal of Women's entrepreneurship and Education,* (1-2), 56-69.

[25] **Lian, J., & Vishwanath, T. (2021).** The COVID-19 crisis in Nigeria: What's happening to welfare? New data call for expanded social protection in Africa's most populous country. www.worldbank.org

[26] **Madichie, N.O, & Agu, G.A.** (2022). The role of universities in scaling up informal entrepreneurship. *Industry and Higher Education, 37*(1). https://doi.org/10.1177/095042222211015

[27] **Modgil, S., Dwivedi, Y.K., Rano, N.P., Gupta, S., & Kamble, S.** (2022). Has Covid-19 accelerated opportunities for digital entrepreneurship? An Indian perspective. *Technological Forecasting and Social Change*, *175*, 121415.

[28] **Mueller, A., Namara, M.C.N.S., & Sinclair, D.A.** (2020). Why does COVID-19 disproportionately affect older people? *Aging*, *12*(10), 9959-9981.

[29] **Mustafa, F., Khursheed, A., Fatima, M., & Rao, M.** (2021). Exploring the impact of COVID-19 pandemic on women entrepreneurs in Pakistan.

International Journal of Gender and Entrepreneurship, *13*(2), 187-203. https://doi.org/10.1108/IJGE-09-2020-0149

[30] **Muzaffar, H.** (2023). Pandemic silver lining: how the COVID-19 pandemic helped women to beat the "gender stereotypes pandemic" in entrepreneurship. *Gender in Management*, *38*(1),76-92. https://doi.org/10.1108/GM-10-2021-0316

[31] **National Bureau of Statistics**. (2022). 20 percent of the full-time workforce in Nigeria lost their jobs due to the COVID-19 pandemic in 2020. September.

[32] **OECD.** (1997). *Defining entrepreneurial activity*. www.oecd.org

[33] **Otrachshenko, V., Popova, O., Nikolova, M., & Tyurina, E.** (2022). COVID-19 and entrepreneurship entry and exit: Opportunity amidst adversity. *Technology in Society*, *71*, 102093.

[34] **Oyewale, A., Adebayo, O., Kehinde, O.** (2021). Estimating the impact of COVID-19 on small and medium scale enterprise: Evidence from Nigeria. https://cgspace.cgiar.org/handle/10568/111225

[35] **Perera, A.** (2023). Framing effect in psychology. https://www.simplypsychology.org

[36] **Peters, E., Hart, P. S., & Fraenkel, L.** (2011). Informing patients: the influence of numeracy, framing, and format of side effect information on risk perceptions. *Medical Decision Making: An International Journal of the Society for Medical Decision Making*, *31*(3), 432–436.

[37] **Ratten, V., & Jones, P.** (2021). Covid-19 and entrepreneurship education: Implications for advancing research and practice. *The International Journal of Management Education*, *19*(1), 100432.

[38] **Sanja, P.P., Dusica, S., & Nikola, V.** (2020).Women entrepreneurship in the time of COVID-19 pandemic: The case of Serbia. *Journal of Women's entrepreneurship and Education,* (3-4), 23-40.

[39] **Santos, S.C., Liguori, E.W., & Garvey, E.** (2023).How digitalization reinvented entrepreneurial resilience during COVID-19. Technological Forecasting and Social Change, 189, *122398,* https://doi.org/10.1016/j.techfore.2023.122398

[40] **Silvia, B., Slavka, K., & Gabriela, G.** (2020). The impact of COVID-19 pandemics on schools: Challenges and new opportunities for a woman-owned organization. *Journal of Women's entrepreneurship and Education,* (3-4),.41-58.

[41] **Sörensson, A. & Ghannad, N.** (2023). Entrepreneurial opportunities and difficulties under COVID-19 for women entrepreneurs in Asia and Europe. *Journal of Entrepreneurship in Emerging Economies*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/JEEE-02-2023-0052

[42] **Tversky, A., & Kahneman, D.** (1985). The framing of decisions and the psychology of choice. In: Wright, G. (eds) Behavioral Decision Making. Springer, Boston, MA. https://doi.org/10.1007/978-1-4613-2391-4_2

[43] **United Nations**. (2020). COVID-19 to slash global economic output by $8.5 trillion over next two years. www.un.org

[44] **United Nations Conference on Trade and Development.** (2021). Global economy could lose over $4 trillion due to COVID-19 impact on tourism. www.unctad.org

[45] **Uwajumogu, N.R., Nwokoye, E.S., Anochiwa, L., Chukwu, A.B., & Agupusi, E.I.** (2022). COVID-19 and Entrepreneurship in Nigeria: Embedded Opportunities and Challenges. *COVID-19 in the African Continent*, 137-152.

[46] **Osabuohien, E., Odularu, G., Ufua, D., & Osabohien, R.** (Eds.) *COVID-19 in the African Continent*, Emerald Publishing Limited, Bingley, pp. 137-152. https://doi.org/10.1108

[47] **Valdez-Juárez, L.E, Castillo-Vergara, M, Ramos-Escobar, E.A**. (2022). Innovative Business Strategies in the Face of COVID-19: An Approach to Open Innovation of SMEs in the Sonora Region of Mexico. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(1), 47. https://doi.org/10.3390/joitmc8010047

[48] **Vamvaka, V., Stoforos, C., Palaskas, T., & Botsaris, C.** (2020). Attitude toward entrepreneurship, perceived behavioral control, and entrepreneurial intention: dimensionality, structural relationships, and gender differences. *Journal of Innovation and Entrepreneurship*, *9*(5), 1-26. https://doi.org/10.1186/s13731-020-0112-0

[49] **WHO.** (2020). *Coronavirus disease (COVID-19)*. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20201005-weekly-epi-update-8.pdf

[50] **World Bank.** (2021). *Impact of COVID-19 on Nigeria*. www.worldbank.org

[51] **Worldometer**. (2023). *Coronavirus death toll and trends*. www.worldometers.info

[52] **Xu, Z., & Jia, H.** (2022). The influence of COVID-19 on entrepreneur's psychological well-being. *Organizational Psychology*, *12*, 823542. https://doi.org/10.3389/fpsyg.2021.823542

[53] **Yao , Z., and Liu, Y** (2023). How Covid-19 impacts the financing in SMEs: Evidence from private firms. *Economic Analysis and Policy.* https://doi.org/10.1016/j.eap.2023.06.036

[54] **Zhong N., Zheng B., Li Y., Poon L., & Xie Z.** (2002). Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People's Republic of China, in February, 2003. *The Lancet*, *362*(9393), 1353-1358.

[55] **Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., ... & Tan, W.** (2020). A novel coronavirus from patients with pneumonia in China, 2019. *New England journal of medicine*, *382*(8), 727-733.

Article history: Received: *November 6th, 2023*
Accepted: *April 17th, 2024*

DOI: 10.28934/jwee24.12.pp248-269
JEL: I24

ORIGINAL SCIENTIFIC PAPER

Advancing Women's Empowerment: Influential Factors in The Educational Sector of Jordan

Eman Awad Albaddawi[1]
University of Pécs, Faculty of Business & Economics, Pécs, Hungary

A B S T R A C T

Women's empowerment is crucial in creating a more equitable society, breaking gender barriers, and fostering sustainable growth by harnessing the talents and contributions of women, especially in the education sector. The percentage of women in the labor force in Jordan is among the lowest worldwide; thus, there is a need to examine the factors affecting this phenomenon. The presented study aims to examine the underlying factors that impact women's empowerment in Jordan's education sector. The selected factors were economic needs, job efficiency, leadership, social needs, organizational commitment, organizational satisfaction, and public policy. The study used convenience sampling to collect data. A survey questionnaire was the main technique for data collection. In total, 367 questionnaires were distributed to women who occupy administrative positions; 311 questionnaires were systematically gathered (84.7% response rate). Structural equation modeling was set as the basis of analysis. The results suggested that economic needs, job efficiency, leadership, social needs, organizational commitment, organizational satisfaction, and public policy have a positive direct impact on women's empowerment in Jordan's education sector. Further studies are encouraged to confirm the findings by taking the background of the respondents into account.

[1] E-mail: albtoush.eman@pte.hu; dr.emanbtoush@gmail.com

KEYWORDS: *women, empowerment, survey questionnaire, education sector, Jordan*

Introduction

There are various definitions and illustrations of women's empowerment (WE), as noted by studies (Sahay, 1998; Nassani et al., 2019; Santoso et al., 2019; Cislaghi et al., 2019; Kunyanti & Mujiono, 2021; Aziz et al., 2022;). The presented study reviewed various conceptualizations and definitions (Sahay, 1998), and a definition of empowerment as an active, multidimensional process which enables women to achieve their full identity and powers in all spheres of life (Pillai, 1995) was adopted. The definition is adopted from a wide range of definitions due to simplicity and inclusive approach. It emphasizes the active process of women while also acknowledging the complexity of the concept itself as multidimensional, not narrowly focused or limiting to achieving equality or access to resources, but as a holistic aspect for women to achieve their full aspirations and potential.

Empowering women is crucial for achieving sustainable development and creating a more equal and just society (Hussain & Jullandhry, 2020). Empowering women has been recognized as a critical step toward achieving gender equality and promoting sustainable development. It helps reduce poverty, improve health outcomes, and promote economic growth (Tindowen, 2019; Aldoghan et al., 2022). It involves challenging and changing the norms and structures that limit women's opportunities and potential, as well as promoting gender-sensitive policies and programs that address gender inequalities (Soharwardi & Ahmad, 2020). Additionally, empowering women has positive effects on the entire community, including men and children, by promoting more inclusive and equitable societies (Sharma & Das, 2021). Overall, women's empowerment is crucial for creating a more equitable and just society, and efforts should be made to ensure that women have equal opportunities to participate fully in all aspects of social and economic life (Ahdan et al., 2019; Lamichhane, 2020).

Efforts for women's empowerment have received great attention in the Middle East, especially in Jordan. Women face significant barriers to economic participation, which can limit their ability to fully participate in society and achieve their potential. Many studies have addressed women's

empowerment and gender roles (Heckert et al., 2019; Priya et al., 2021; Abou-Shouk et al., 2021).

Jordan has one of the lowest rates of female labor force participation in the entire globe. According to the IMF (2022), Jordan ranks fifth from the bottom of the list in terms of female participation out of 185 countries and territories; Jordan exhibited notable gender disparities in its labor market, with female unemployment rates at 23%, significantly higher than the 12% observed for males. Labor force participation further underscored this divide, featuring a mere 14.7% for females against 62.5% for males. A prominent trend is observed where half of the women withdraw from the workforce by the age of 30. Unemployment is particularly evident in the private sector, where female representation is low, paralleled by a reduction in public sector employment opportunities. Female business ownership stands at 18%, contrasted with males at approximately 82%. The roots of such low female participation are complex, intertwined with issues in structural infrastructure, public policy, and regulation (IMF, 2022; World Bank, n.d.).

Despite the remarkable improvements in educational attainment among women in Jordan, the female labor force participation rate remains low (Koburtay et al., 2023). On the other hand, the low representation of women in leadership positions in the Jordanian Ministry of Education results in their participation in educational decision-making at the Ministry level noticeably low. The weakness of women's economic and political empowerment and gender inequality are among the most important challenges facing Jordanian women. Women's empowerment is an incentive to build more inclusive societies and a means to achieve sustainable growth rates, and it is not possible to discuss society's progress economically politically, or socially without the active participation of women (Aziz et al., 2022).

Various strategies can be employed to promote women's empowerment, one of the most pivotal being the promotion of education and skills training (Verma, 2009; Heckert et al., 2019; Priya et al., 2021; Ivanovic et al., 2021), especially in Jordan (Abou-Shouk et al., 2021). Providing access to education is essential to help women develop the skills they need to succeed in the workforce and become leaders in their communities. This closely linked with economic and political empowerment, for instance, research highlights a significant financial inclusion gap of women globally, especially in some Arab countries (i.e., Saudi Arabi and Bahrain) (which share many similarities with Jordan

(Antonijević et al., 2022). However, the interplay in the education sector between factors affecting women's empowerment development is often ignored. Therefore, there is a strong need for a deep understanding of how these factors interplay.

The presented study aims to identify key determinant factors of women's empowerment and assess the potential effect of these factors on women's empowerment within the educational sector of Jordan. The objectives were extended further to empirically evaluate the interactions of affecting factors and the extent of their effect.

Data and Method

Identifying the Influential Factors in Women's Empowerment

Identifying the influential factors holds equal importance to examining their significance subsequently. Therefore, to be inclusive while also preserving the focus and simplicity, any empowerment of women needs to consider contextuality because empowerment is contextual (Richardson 2018), such as individualism, social inclusion, the physical context of the women, economic needs, and psychological context (Verma, 2009). Through the means of education as a pivotal mechanism for empowerment and guided by theoretical frameworks on empowerment, the presented study has identified critical factors for empirical examination based on the contextual framework. These factors were chosen based on their theoretical relevance and potential impact on empowerment and they include: Economic Needs (EN), Job Efficiency (JE), Leadership (LE), Social Needs (SE), Organizational Commitment (OC), Organizational Satisfaction (OS), and Public Policy (PP).

Economic needs are instrumental tools in the empowerment process as economic resources enhance individual freedom (Sen, 1999), while job efficiency also enhances self-efficiency and independence (Becker, 2009). Leadership is also seen as a means of fostering a high sense of purpose and self-ability, which in turn is translated into more empowerment (Bass, 1985). Similarly, reaching higher objectives in life requires fulfilling psychological well-being. Therefore, it is important to acknowledge the significance of addressing social needs, which are at the core of psychological well-being, as highlighted by Maslow (2000). Organizational commitment and organizational satisfaction can both lead to greater

enhancement of skills and performance and organizational growth, as illustrated in the literature (Meyer, 1991; Locke, 1976). Finally, public policy serves as a means to remove barriers and pave the road for a strong empowerment ecosystem (Duflo, 2012).

However, while these selected factors may not encompass the full range of potential effects on women's empowerment, they collectively represent the most important contextual considerations for women's empowerment. The factors in the presented study, serving as indicators as well, fulfill the purpose of the aforementioned context (Verma, 2009) and have also shown practicality in various other literature (see Spector, 1997; Macey et al., 2011; Van Dierendonck & Nuijten, 2011; Gottlieb & Bergen, 2010; Malik et al., 2010; Belias & Koustelios, 2014; Forgeard et al., 2011; Sserwanja et al., 2022). The factors are assumed to collectively encompass the multifaceted nature of empowerment within both the individual and organizational context of the Jordanian educational sector.

This study adopted a survey questionnaire as the main technique for data collection, utilizing a cross-sectional study approach for women employees in the Jordanian education sector. The target population of this study consisted of approximately 7 388 women who are employed in the Jordanian education sector. This study used the distributed tables method (Krejcie & Morgan, 1970) in order to calculate a sample size, where the sample size reached a total of 367 respondents. An important method for gathering data was convenience sampling because it is the easiest way to reach the respondents. 367 questionnaires were distributed to women who occupy administrative positions in the Jordanian Ministry of Education. Data were collected using a paper-and-pencil survey method. Female participants were provided with structured questionnaires. The surveys were distributed in person at the designated work locations during April 2023 and respondents had four weeks to complete the survey. All collected data were anonymized and securely stored in compliance with local data regulations to protect participants' privacy.

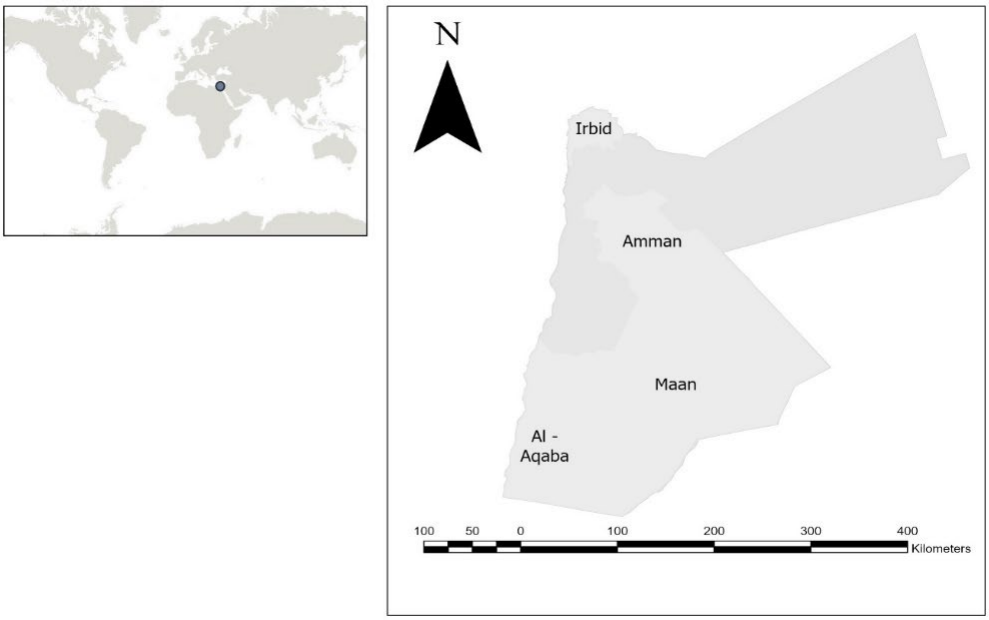
The targeted sample consisted of females aged 25 to 60. To enhance the response rate, background information was not requested from participants due to the sensitive nature of such information within Jordanian society. This approach was taken despite assurances of anonymity provided to participants. By the end of the allotted time, 311 questionnaires had been collected, resulting in an 84.7% response rate. This rate supports Kline's

(2015) findings that a sample size of 200 or more is suitable for the target analysis.

The basis of analysis was based on the following selected factors: economic needs (EN), job efficiency (JE), leadership (LE), social needs (SE), organizational commitment (OC), organizational satisfaction (OS), and public policy (PP).

Each of the factors was measured by a set of aspects, specified as questions in the survey. Economic needs were measured by 4 aspects, job efficiency by 6 aspects, leadership by 8 aspects; social needs were measured by 7 aspects, an organizational commitment by 5 aspects, organizational satisfaction by 5 aspects, and public policy was measured by 7 aspects. Finally, women's empowerment (WE), as the main dependent variable, was measured by 9 aspects.

Figure 1: The study locations, showcasing equitable distribution across diverse regions of Jordan



Source: Authors' research

All these aspects were measured using a 5-point Likert-type scale where '1' indicates 'Strongly Disagree', '2' indicates 'Disagree', '3' is 'Neutral', '4' is 'Agree', and '5' is 'Strongly Agree'. In the course of our analysis, we

investigated seven distinct hypotheses, each addressing a factor that potentially influences women's empowerment. This study investigates the directionality of this influence, assessing selected factors (positively or negatively impact WE) so the "impact" here implies either a positive or negative effect.

Hypothesis 1 (H1): Economic needs have a positive impact on women's empowerment.

Hypothesis 2 (H2): Job efficiency has a positive impact on women's empowerment.

Hypothesis 3 (H3): Leadership has a positive impact on women's empowerment.

Hypothesis 4 (H4): Social needs have a positive impact on women's empowerment.

Hypothesis 5 (H5): Organizational commitment has a positive impact on women's empowerment.

Hypothesis 6 (H6): Organizational satisfaction has a positive impact on women's empowerment.

Hypothesis 7 (H7): Public policy has a positive impact on women's empowerment.

Structural Equation Modeling (SEM), as utilized in the analysis referenced by Hair et al. (2019), proves advantageous when dealing with complex structural models containing numerous constructs, indicators, and model relationships. It is particularly useful in these cases, especially when the path model involves one or more formatively measured constructs and also when analyzing financial ratios or similar data types. Considering the above criteria, SEM emerged as a fitting statistical analysis for the study. Table 1 represents the key factors, description, and measurement scale.

Table 1: Description of key factors and their measurement scales

Variable (Factor)	**Description**	**Sample statement of aspect used to measure the variable (5-point Likert Scale)**
Economic Needs (EN)	Measures the extent to which individuals perceive finance related as a means of empowerment.	My organization provides all forms of compensation and benefits to employees 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.
Job Efficiency (JE)	Assesses employees' perceptions of efficiency and productivity at work.	I feel efficient and productive in my current role. 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.
Leadership (LE)	Evaluates employees' satisfaction with leadership and management within the organization.	My supervisor can understand my situation and give me encouragement and assistance. 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.
Social Needs (SE)	Measures the importance of social interactions and relationships at work.	My organization provides social groups inside the work environment. 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.
Organizational Commitment (OC)	Assesses the level of commitment and loyalty employees feel towards their organization.	I feel emotionally attached to my organization. 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.
Organizational Satisfaction (OS)	Measures overall job satisfaction within the organization.	I am satisfied with the existing salary structure of the company. 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.
Public Policy (PP)	Measure perceptions of how public policy affects working conditions.	I am satisfied with the public policy. 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.
Women empowerment (WE)	Measure the empowerment of participating females	Women employees have authority, power, and influence to make and implement decisions about tasks. Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree

Source: author's research

Empirical Results

Table 2 illustrates internal consistency, reliability, convergent validity, and discriminant validity. Values of the modeling parameters that were above the threshold criteria were retained; as per Aburumman et al. (2023), their loadings varied from 0.711 to 0.941. Cronbach's alpha values ranged from 0.738 to 0.913, and for all components, from 0.841 to 0.945 for the composite reliability. Therefore, these results follow Hair et al. (2016; 2019) that acceptable Cronbach's alpha and composite reliability values should range from 0.70 to 0.95. As shown in Table 2 results, all average variance extracted (AVE) values were above the specified threshold values of 0.50 and above (Aburumman et al., 2023). The statistical analysis was performed using SmartPLS (version 3.3.9).

Table 2: Results of testing for consistency and accuracy of selected factors

Factors	Aspects	Loadings	Cronbach's Alpha	Composite Reliability	AVE
Economic Needs	EN1	0.889	0.821	0.879	0.709
	EN2	0.902			
	EN3	0.711			
	EN4	0.891			
Job Efficiency	JE1	0.850	0.738	0.841	0.640
	JE2	0.924			
	JE3	0.815			
	JE4	0.763			
	JE5	0.881			
	JE6	0.749			
Leadership	LE1	0.941	0.913	0.945	0.852
	LE2	0.912			
	LE3	0.920			
	LE4	0.859			
	LE5	0.850			
	LE6	0.924			
	LE7	0.815			
	LE8	0.922			
Social Needs	SN1	0.819	0.855	0.909	0.769
	SN2	0.932			
	SN3	0.929			
	SN4	0.860			
	SN5	0.771			

Factors	Aspects	Loadings	Cronbach's Alpha	Composite Reliability	AVE
	SN6	0.932			
	SN7	0.919			
Organizational Commitment	OC1	0.833	0.889	0.931	0.799
	OC2	0.914			
	OC3	0.871			
	OC4	0.917			
	OC5	0.868			
Organizational Satisfaction	OS1	0.756	0.874	0.882	0.661
	OS2	0.743			
	OS3	0.817			
	OS4	0.860			
	OS5	0.810			
Public Policy	PP1	0.779	0.863	0.887	0.671
	PP2	0.865			
	PP3	0.854			
	PP4	0.854			
	PP5	0.822			
	PP6	0.894			
	PP7	0.843			
Women's empowerment	WE1	0.894	0.851	0.901	0.669
	WE2	0.929			
	WE3	0.743			
	WE4	0.831			
	WE5	0.816			
	WE6	0.936			
	WE7	0.845			
	WE8	0.777			
	WE9	0.821			

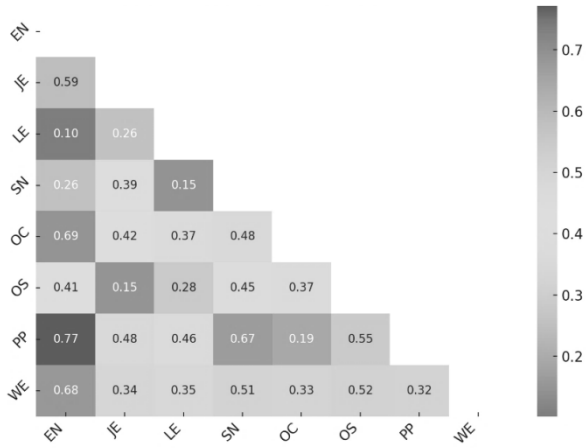
AVE denotes the average variance extracted. Each aspect was assessed by a question, evaluated, and measured using a 5-point Likert-type scale

Source: Authors' research

Discriminant validity (Henseler et al., 2015) was assessed according to HTMT criteria (Heterotrait-Monotrait). The HTMT criteria, based on a comparison of the heterotrait-heteromethod correlations and the monotrait-heteromethod correlations, identify a lack of discriminant validity, effectively. A lower HTMT indicates higher discriminant validity, suggesting the constructs are more distant from each other. Henseler et al.

(2015) recommend threshold values range from 0.85 or 0.90, where values above this may indicate discriminant validity problems between the constructs. Figure 2 illustrates the discriminant validity analysis, where all of the HTMT values for each factor (i.e., EN to PP) were less than 0.85 and fell between the ranges of 0.102 and 0.772 (see also Aburumman et al., 2023), indicating adequate distinctiveness of the factors in the analysis with EN and PP demonstrating lowest distinctive power.

Figure 2: A heatmap of the discriminant validity of the factors used in the analysis. Each cell represents the values associated with two factors at a time



Source: Authors' research

Table 3 shows hypotheses testing according to the bootstrapping method of Hayes and Preacher (2014). All the hypotheses (i.e., H1 to H7) tested revealed a positive impact. The significance of these factors in positively empowering women suggests that holistic strategies addressing these factors could be effective in further enhancing women's empowerment in this sector. It has been shown empirically that some factors have a stronger positive impact (i.e., Organizational Commitment, Organizational Satisfaction, and Social Needs), but the interplay of these factors within the particular environment of the education sector should also be observed. The *β*-values in the study range from 0.074 for Leadership to 0.169 for Organizational Commitment, indicating varying degrees of impact on women's empowerment in the Jordanian education sector. The *p*-values range from less than 0.001 for both Social Needs and Organizational

Commitment, suggesting very strong statistical significance, to 0.037 for Leadership, which still denotes a significant impact but with less statistical strength compared to the others. Specification of the empirical model for testing the hypothesis can be represented as follows:

$WE=\beta_0+\beta_1(factor)+\epsilon$

Where:
WE denotes Women's Empowerment as the dependent variable.
factor denotes the factor being examined as the independent variable.
β_0 is the intercept term.
β_1 is the coefficient.
ϵ is the error term

Table 3: The hypotheses tested across different factors affecting WE. H1 to H7 denote the hypotheses being evaluated

No.	Hypotheses	B	Standard Error	T-Value	P-Value	Decision
H1	EN→WE	0.094	0.68	2.208	0.014*	Supported
H2	JE→WE	0.082	0.74	2.016	0.022*	Supported
H3	LE→WE	0.074	0.88	1.783	0.037*	Supported
H4	SN→WE	0.161	0.47	2.978	0.000***	Supported
H5	OC→WE	0.169	0.43	3.572	0.000***	Supported
H6	OS→WE	0.159	0.49	2.838	0.002**	Supported
H7	PP→WE	0.140	0.55	2.474	0.007**	Supported

*Note: *: p<0.001; 5,000 bootstrap samples*
Source: Authors' research

Discussion

This study aims to examine factors that impact women's empowerment in Jordanian education. The findings suggested that all factors have a positive impact on WE. This result is consistent with the reported results by other studies and reviews (Varghese, 2011; Yaghi, 2016; Gupta & Mirchandani, 2018; Khayyal et al., 2021). Considering that the examined factors have a positive enhancement on WE, it is important to address the structural barriers that prevent women from participating in the job market.

This includes addressing gender-based discrimination, providing access to education and training, promoting equal pay for equal work, and creating supportive policies and programs that enable women to balance work and family responsibilities. Yet, capturing WE in a complicated case should be treated on a case-by-case basis (Raudeliuniene et al., 2014).

In the process of examining various dimensions of women's empowerment, it was discovered that not all factors have corresponding studies for direct comparison. However, it was possible to identify factors that are closely related to the ones under investigation. Samanta (2020) expanded upon a similar concept by combining the SEM with a detailed Ordinary Least Squares (OLS) output and multiple variables, in contrast to the presented study's approach of testing hypotheses one variable at a time through the bootstrapping method (see Hayes & Preacher 2014), which enhances the robustness, especially the standard errors and significance levels (*p*-values), by using resampling techniques. There is no prior assumption of normal distribution, making it suitable for complex models and small sample sizes.

Samanta's (2020) work focused on a specific, less visible type of empowerment (self-compassion-based empowerment) and its positive impact on reproductive health, aligning with the social needs factor in the presented study.

Despite different sample sizes (e.g., 569 vs. 311 in the presented study), both studies found consistent results supported by acceptable construct loadings.

Another study (Sarumathi & Mohan, 2011), with a 181 sample size to investigate the effect of micro-finance on empowerment in entrepreneurial women, showed that it also has a positive impact of microfinance on women empowerment. Although the study used a different approach of paired-t-test to test the hypothesis, it reached the same conclusion with a smaller sample size in another segment of society, adding further support to the results obtained within the educational sector of Jordan. Similarly, several studies investigated the factors that impact the entrepreneurship intention of females as a proxy of empowerment (Rahman et al., 2022; Messikh, 2021; Manjaly et al., 2022) using behavioral theory. Different sample sizes of female participants were utilized, comparable to the sample size being applied in the presented study (i.e., 251, 254 and 284, respectively). The significance effect, though, was not assessed based on the same approach but in another way, such as a one-sample t-test (i.e., Messikh 2021). In the latter study,

Messikh (2021), with a sample of 254 female students, found a positive effect of behavioral factors that are quite linked to the factors we presented here. For instance, Algeria is an Arab country that shares many cultural norms and customs. Parental Support (linked to social needs) and government support (linked to public policy) were very influential factors that contributed to entrepreneurial intention and, eventually, empowerment. These results from another Arab nation, can validate and support the presented study's findings of positive effect of social needs and public policy on WE.

The approach in the study by Muluneh et al. (2012) differs from the one presented here, particularly in the categorization of constructs related to empowerment. Muluneh et al. (2012) did not group dependent and independent constructs under broader categories like social needs and public policy and also did not use a Likert-type scale for measuring the response of various constructs across a sample of 746 respondents. Grouping factors that influence empowerment into main categories, as done in the presented study, offers a practical advantage by streamlining the analysis and time-effective manner, despite being potentially less detailed. Nevertheless, Muluneh et al. (2012) findings still support the notion that social needs and public policy positively impact empowerment.

Malhotra et al. (2002) delineated dimensions like legal, economic, familial, psychological, socio-cultural, and political empowerment, differing from the framework in Verma (2009) used in the presented study. Sarwar and Chaudhry (2021) employed dimensions from Malhotra et al. (2002), such as psychological, economic, familial, and socio-cultural empowerment, in a study with 321 respondents, showing a positive impact on women's empowerment. This finding aligns with the presented study, illustrating that despite differences in frameworks, the core dimensions related to empowerment consistently show a positive impact on WE.

The presented study identified factors that align with and considered the United Nations' delineation of five crucial elements of empowerment (UN WOMEN, n.d.). While these components were implicit in the study's theme, it is important to note that they may not encompass the entirety of influential factors. Our primary objective, however, was to prioritize the most significant factors capable of capturing the nuanced variations within Jordanian society.

The settings of the workplace, the gender balance (female to male ratio), and workplace policy are expected to affect the results, as we can see

from a global scale, and Jordan is no exception (Rocha & Winkler, 2019). However, we were not expecting a greater deal in the presented study as there was, to a larger extent, homogeneity in the various locations where the study took place. Likewise, the size of a workplace should have an effect (Rocha & Winkler, 2019) because diverse sizes were included in the study, so results should be interpreted with caution in this regard. The smaller scale can foster a more collaborative and communicative environment while a larger scale can hinder this ability but provide more career development and trajectory of improvement. This can be crucial, which was not tested in the presented study, though the variation can be mitigated by adopting random sampling.

The presented study was exclusively focused on the education sector. It is important to note, however, that the work culture in private educational institutions often tends to differ from that in public educational facilities. The sample size chosen for the study encompassed a wide range across the education spectrum. Furthermore, according to the IMF (2022), job creation in Jordan's private sector is relatively low compared to the public sector. In addition, the scope of this study did not encompass the impact of these factors in other sectors, such as industry and agriculture, etc. However, it is plausible that the findings could be mirrored in different sectors, though further investigation is necessary.

The anticipation that various factors would impact women's empowerment was affirmed, but the magnitude of the factors' effect is worth navigating through. Furthermore, there was a strong indication with low p-value and other analysis parameters (i.e., β), suggesting that *Organizational Commitment, Organizational Satisfaction, and Social Needs* had stronger effects compared to others on WE. Because women are very much aware of the factors leading to their empowerment (Varghese, 2011), these factors enable the advancement in career smoothly, which in turn enhances the chance of women to stay longer in the workforce, leading to greater independence for women. The latter was found to be a major hindrance for WE in Jordan (Gharaibeh et al., 2009). In addition, there is near consensus in the literature that employee well-being is at the heart of productivity, and there is no significant gender difference in that sense (Schulte & Vainio, 2010). This also means that for any future roadmap, policy improvement should consider women's well-being at work as a crucial step toward empowerment.

Ethnicity, as a delicate subject within Jordan, should have some degree of WE. However, we could not address this aspect as the diversity of the population is aimed at highlighting national unity rather than ethnic distinction. Jordan is home to a large refugee population and their needs might be more challenging than those of the rest (Jabbar & Zaza, 2016). Likewise, addressing marital status and its implications should be done with caution (Banihani, 2020), as not all opinions regarding economic and social needs can be easily generalized across diverse backgrounds.

The presented study limitations were identified; no special attention was paid to each stratum (city) characteristics, but the study strived to include all the regions within the country; the background of respondents was not collected during the survey as this could affect how respondent view the "needs" and factors largely. In addition, the study was conducted in an urban environment, excluding the rural areas. Some of the factors examined, such as PP and EN, showed relatively lower distinctive power (i.e., HTMT values of 0.772), but this was not expected to significantly affect the result greatly. Nevertheless, the nature of the examined factors implied some degree of overlap, but it was within the acceptable margin of the presented study.

Conclusion

The presented study has provided valuable insights into the intricate relationship between WE and various influential factors. The study underscores the positive influence of various factors on women's empowerment in Jordan's education sector, aligning with global research in the same direction. It highlights the necessity of dismantling structural barriers to enhance women's working conditions in the education sector toward empowerment by observing the nature of Jordanian society. Women's well-being at work (i.e., social needs and organizational commitment) were the most influential of the examined factors.

The findings emphasize that the education sector in Jordan is not necessarily distinct from other sectors regarding women's empowerment challenges. The same factors influencing women's empowerment in different parts of the world also impact the empowerment of women in the education sector of Jordan. Moreover, addressing the factors affecting women's empowerment from a broad, contextual perspective is more effective than focusing on narrowly defined sub-factors. A holistic approach

allows for a comprehensive understanding of the variety of challenges and barriers women might face, ensuring that possible mitigation efforts are balanced and impactful across different aspects of empowerment.

While the findings were confirmed by many studies, this result should be interpreted with caution. Therefore, we encourage further studies and exploration of these findings, considering possible interfering elements such as geographical distribution (e.g., urban vs. rural areas) and the background of respondents. This approach aims to develop evidence-based practices tailored to enhance women's empowerment and amplify their societal contributions.

Acknowledgments

The author would like to extend sincere gratitude for the financial support provided by the Stipendium Hungaricum Scholarship to conduct the research as an integral component of the doctoral dissertation. Additionally, the author would like to express gratitude to the anonymous experts who generously contributed their assistance during the data collection process. Appreciation also goes to the anonymous reviewers for their valuable comments to improve the content of the manuscript.

References

[1] **Abou-Shouk, M. A., Mannaa, M. T., & Elbaz, A. M.** (2021). Women's empowerment and tourism development: A cross-country study. *Tourism Management Perspectives*, *37*, 100782. https://doi.org/10.1016/J.TMP.2020.100782

[2] **Aburumman, O. J., Omar, K., Al Shbail, M., & Aldoghan, M.** (2022). How to Deal with the Results of PLS-SEM? *International Conference on Business and Technology*, 1196–1206.

[3] **Ahdan, S., Kaharuddin, A. H. B., & Yusriadi Yusriadi, U. F.** (2019). Innovation And Empowerment Of Fishermen Communities In Maros Regency. *International Journal of Scientific and Technology Research*, *8*(12).

[4] **Al Khayyal, A. O., Alshurideh, M., Al Kurdi, B., & Salloum, S. A.** (2021). Women Empowerment in UAE: A Systematic Review. *Advances in Intelligent Systems and Computing*, *1261 AISC*, 742–755. https://doi.org/10.1007/978-3-030-58669-0_66/COVER

[5] **Aldoghan, M., Aburumman, O. J., Omar, K., & Abdulwahid, N. A.** (2022). The impact of key indicators on the overall performance of Saudi Arabian telecommunication companies, *Problems and Perspectives in Management*, *20*(3), 192–203. https://doi.org/10.21511/ppm.20(3).2022.16

[6] **Antonijević, M., Ljumović, I., & Ivanović, Đ.** (2022). Is there a Gender Gap in Financial Inclusion Worldwide?. *Journal of Women's Entrepreneurship and Education*, (1-2), 79-96. https://doi.org/10.28934/jwee22.12.pp79-96

[7] **Aziz, N., He, J., Raza, A., & Sui, H.** (2022). A systematic review of review studies on women's empowerment and food security literature. *Global Food Security*, *34*, 100647. https://doi.org/10.1016/j.gfs.2022.100647

[8] **Banihani, M.** (2020). Empowering Jordanian women through entrepreneurship. *Journal of Research in Marketing and Entrepreneurship*, *22*(1), 133–144. https://doi.org/10.1108/JRME-10-2017-0047

[9] **Bass, B. M**. (1985). *Leadership and Performance Beyond Expectations*. Free Press.

[10] **Becker, G. S.** (2009). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago press.

[11] **Belias, D., & Koustelios, A.** (2014). Organizational Culture and Job Satisfaction: A Review. *International Review of Management and Marketing*, *4*(2), 132–149. www.econjournals.com

[12] **Cislaghi, B., Denny, E. K., Cissé, M., Gueye, P., Shrestha, B., Shrestha, P. N., Ferguson, G., Hughes, C., & Clark, C. J.** (2019). Changing Social Norms: the Importance of "Organized Diffusion" for Scaling Up Community Health Promotion and Women Empowerment Interventions. *Prevention Science*, *20*(6), 936–946. https://doi.org/10.1007/s11121-019-00998-3

[13] **Duflo, E.** (2012). Women empowerment and economic development. *Journal of Economic literature*, 50(4), 1051-1079.

[14] **Forgeard, M. J. C., Jayawickreme, E., Kern, M. L., & Seligman, M. E. P.** (2011). Doing the Right Thing: Measuring Well-Being for Public Policy. *International Journal of Wellbeing*, *1*(1), 79–106. https://doi.org/10.5502/ijw.v1i1.15

[15] **Gharaibeh, M., & Oweis, A.** (2009). Why do Jordanian women stay in an abusive relationship: Implications for health and social well-being. *Journal of Nursing Scholarship*, *41*(4), 376–384. https://doi.org/10.1111/j.1547-5069.2009.01305.x

[16] **Gottlieb, B. H., & Bergen, A. E.** (2010). Social support concepts and measures. *Journal of psychosomatic research*, *69*(5), 511-520. https://doi.org/10.1016/j.jpsychores.2009.10.001

[17] **Gupta, M.** (2020). Role of NGOs in women empowerment: case studies from Uttarakhand, India. *Journal of Enterprising Communities*, *15*(1), 26–41. https://doi.org/10.1108/JEC-04-2020-0066

[18] **Gupta, N., & Mirchandani, A.** (2018). Investigating entrepreneurial success factors of women-owned SMEs in UAE. *Management Decision*, *56*(1), 219–232. https://doi.org/10.1108/MD-04-2017-0411

[19] **Hair Jr, J., Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M.** (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications.

[20] **Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M.** (2019). When to use and how to report the results of PLS-SEM. *European business review*, *31*(1), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

[21] **Hayes, A. F., & Preacher, K. J.** (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*, *67*(3), 451–470. https://doi.org/10.1111/bmsp.12028

[22] **Heckert, J., Olney, D. K., & Ruel, M. T.** (2019). Is women's empowerment a pathway to improving child nutrition outcomes in a nutrition-sensitive agriculture program?: Evidence from a randomized controlled trial in Burkina Faso. *Social Science and Medicine*, *233*, 93–102. https://doi.org/10.1016/j.socscimed.2019.05.016

[23] **Henseler, J., Ringle, C. M., & Sarstedt, M.** (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

[24] **Heywood, E.** (2020). Radio Journalism and Women's Empowerment in Niger. *Journalism Studies*, *21*(10), 1344–1362. https://doi.org/10.1080/1461670X.2020.1745668

[25] **Hussain, S., & Jullandhry, S.** (2020). Are urban women empowered in Pakistan? A study from a metropolitan city. *Women's Studies International Forum*, *82*. https://doi.org/10.1016/j.wsif.2020.102390

[26] **IMF.** (2022). Female Employment and Labor Force Participation in Jordan. https://www.imf.org/-/media/Files/Countries/MCD/JOR/employment-and-labor-force-participation-in-jordan-for-posting.ashx

[27] **IMF.** (2022). *IMF Country Report No. 22/222 JORDAN*.

[28] **Ivanovic, Dj., Simovic V., Domazet I., Antonijević M**. (2021). Average Matching Levels for Two DigComp Competence Areas of the Female Entrepreneurs in Serbia. *Journal of Women's Entrepreneurship and Education*, 3-4, 42-60. https://doi.org/10.28934/jwee21.34.pp42-60

[29] **Jabbar, S. A., & Zaza, H. I.** (2016). Evaluating a vocational training programme for women refugees at the Zaatari camp in Jordan: women empowerment: a journey and not an output. *International Journal of Adolescence and Youth*, *21*(3), 304–319. https://doi.org/10.1080/02673843.2015.1077716

[30] **Kline, R. B.** (2015). *Principles and practice of structural equation modeling.* Guilford publications.

[31] **Koburtay, T., & Abualigah, A.** (2023). The Interplay Between Workplace Incivility, Religiosity and Well-Being: Insights from Jordan and the United Arab Emirates. *Journal of Religion and Health*, 1–23. https://doi.org/10.1007/s10943-023-01862-z

[32] **Koburtay, T., Abuhussein, T., & Sidani, Y. M.** (2023). Women Leadership, Culture, and Islam: Female Voices from Jordan. *Journal of Business Ethics*, *183*(2), 347–363. https://doi.org/10.1007/s10551-022-05041-0

[33] **Krejcie, R. V., & Morgan, D. W.** (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, *30*(3), 607–610. https://doi.org/10.1177/001316447003000308

[34] **Lamichhane, B. D.** (2020). Microfinance for Women Empowerment: A Review of Best Practices. *Interdisciplinary Journal of Management and Social Sciences*, *1*(1), 13–25. https://doi.org/10.3126/ijmss.v1i1.34504

[35] **Locke, E. A.** (1976). *The Nature and Causes of Job Satisfaction*. In M. D. Dunnette (Ed.), Handbook of Industrial and Organizational Psychology. Rand McNally.

[36] **Macey, W. H., Schneider, B., Barbera, K. M., & Young, S. A.** (2011). *Employee engagement: Tools for analysis, practice, and competitive advantage*. John Wiley & Sons. https://doi.org/10.1002/9781444306538.indsub

[37] **Malhotra, A., Schuler, S. R., & Boender, C.** (2002,). Measuring women's empowerment as a variable in international development. In background paper prepared for the World Bank Workshop on Poverty and Gender: New Perspectives (Vol. 28, p. 58). Washington, DC: The World Bank.

[38] **Malik, M. E., Nawab, S., Naeem, B., & Danish, R. Q.** (2010). Job Satisfaction and Organizational Commitment of University Teachers in Public Sector of Pakistan. *International Journal of Business and Management*, *5*(6). https://doi.org/10.5539/ijbm.v5n6p17

[39] **Manjaly, N. B., Joseph, G., Nimmi, P. M., & KS, K. N.** (2022). Entrepreneurial Intention of Indian Women University Students. *Journal of Women's Entrepreneurship and Education*, (3-4), 273-290. https://doi.org/10.28934/jwee22.34.pp273-290

[40] **Maslow, A. H.** (2000). *A theory of human motivation*. Classics in Management Thought-Edward Elgar Publishing, 1, 450.

[41] **Messikh, A.** (2021). The Entrepreneurial Intention of Algerian Women (a Sample Study of Skikda University Female Students). *Journal of Women's Entrepreneurship and Education*, (3-4), 134-150. https://doi.org/10.28934/jwee21.34.pp134-150

[42] **Meyer, J. P., & Allen, N. J.** (1991). A three-component conceptualization of organizational commitment. *Human resource management review*, 1(1), 61-89.

[43] **Muluneh, M. D., Francis, L., Ayele, M., Abebe, S., Makonnen, M., & Stulz, V.** (2021). The effect of women's empowerment in the utilisation of family planning in western Ethiopia: a structural equation modelling approach. *International Journal of Environmental Research and Public Health*, 18(12). https://doi.org/10.3390/ijerph18126550

[44] **Nassani, A. A., Aldakhil, A. M., Abro, M. M. Q., Islam, T., & Zaman, K.** (2019). The impact of tourism and finance on women empowerment. *Journal of Policy Modeling*, *41*(2), 234–254. https://doi.org/10.1016/j.jpolmod.2018.12.001

[45] **Pillai J.K** (1995). *Women and empowerment*. Gyan Publishers House, New Delhi.

[46] **Priya, P., Venkatesh, A., & Shukla, A.** (2021, July). Two decades of theorising and measuring women's empowerment: Literature review and future research agenda. In *Women's Studies International Forum* (Vol. 87, p. 102495). Pergamon. https://doi.org/10.1016/j.wsif.2021.102495

[47] **Rahman, M. M., Salamzadeh, A., & Tabash, M. I.** (2022). Antecedents of entrepreneurial intentions of female undergraduate students in Bangladesh: a covariance-based structural equation modeling approach. *Journal of Women's Entrepreneurship and Education*, (1-2). 137-153. https://doi.org/10.28934/jwee22.12.pp137-153

[48] **Raudeliuniene, J., Dzemyda, I., & Kimpah, J.** (2014). Factors for assessment of women empowerment: Theoretical approach'. In *8th International Scientific Conference on Business and Management* (pp. 15-16).

[49] **Richardson, R. A.** (2018). Measuring women's empowerment: A critical review of current practices and recommendations for researchers. *Social Indicators Research*, *137*(2), 539-557. https://doi.org/10.1007/s11205-017-1622-4

[50] **Sahay, S.** (1998). *Women and empowerment: Approaches and strategies*. Discovery Publishing House.

[51] **Samanta, T. (2020).** Women's empowerment as self-compassion?: Empirical observations from India. Plos one, 15(5). https://doi.org/10.1371/journal.pone.0232526

[52] **Sarumathi, S., & Mohan, K.** (2011). Role of Micro Finance in Women's Empowerment (An Empirical study in Pondicherry region rural SHG's). *Journal of Management and Science*, *1*(1), 1-8. https://doi.org/10.26524/jms.2011.1

[53] **Sarwar, A. and Chaudhry, M. A.** (2021). The role of women empowerment towards household poverty reduction: evidence from Punjab,

Pakistan. *Humanities & Social Sciences Reviews*, *9*(3), 384-397. https://doi.org/10.18510/hssr.2021.9339

[54] **Schulte, P., & Vainio, H.** (2010). Well-being at work–overview and perspective. *Scandinavian Journal of Work, Environment & Health*, 422–429. https://www.jstor.org/stable/40967878

[55] **Sen, A.** (2014). Development as freedom. The globalization and development reader: Perspectives on development and global change, 525.

[56] **Soharwardi, M. A., & Ahmad, T. I.** (2020). Dimensions and determinants of women empowerment in developing countries. *International Journal of Sustainable Development and Planning*, *15*(6), 957–964. https://doi.org/10.18280/ijsdp.150620

[57] **Spector, P.** (1997). *Job satisfaction: Application, assessment, causes, and consequences* (Vol. 3). SAGE Publications.

[58] **Tindowen, D. J.** (2019). Influence of empowerment on teachers' organizational behaviors. *European Journal of Educational Research*, *8*(2), 617–631. https://doi.org/10.12973/eu-jer.8.2.617

[59] **van Dierendonck, D., & Nuijten, I.** (2011). The Servant Leadership Survey: Development and Validation of a Multidimensional Measure. *Journal of business and psychology*, *26*, 249-267. https://doi.org/10.1007/s10869-010-9194-1

[60] **Verma, M. M.** (2009). Approaches to Women's Empowerment: An Overview. *IASSI Quarterly*, *28*(1), 230-249.

[61] **W, R. W. A., Kunyanti, S. A., & Mujiono, M.** (2021). Community Empowerment-based Corporate Social Responsibility Program in Panglima Raja Village. *International Journal on Social Science, Economics and Art*, *11*(1), 12–19. https://doi.org/10.35335/ijosea.v10i1.2

[62] **Wei, M., Patadia, S., & Kammen, D. M.** (2010). Putting renewables and energy efficiency to work: How many jobs can the clean energy industry generate in the US? *Energy Policy*, *38*(2), 919–931. https://doi.org/10.1016/j.enpol.2009.10.044

[63] **World Bank.** (2011). World development report 2012: Gender equality and development. The World Bank.

[64] **World Bank. (n.d.).** Gender Data Portal: Jordan. https://genderdata.worldbank.org/countries/jordan

Article history: Received: January 10th, 2024

Accepted: April 18th, 2024

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

33

JOURNAL of Women's Entrepreneurship and Education : twice a Year Scientific Journal / editor-in
-chief Mirjana Radović-Marković. - 2009, No.
1/2- . - Belgrade : Institute of Economic Sciences,
2009- (Beograd : Donat Graf) . - 24 cm

Dva puta godišnje . - Drugo izdanje na drugom medijumu: Journal of Women's Entrepreneurship and Education (Online) = ISSN 2406-0674
ISSN 1821-1283 = Journal of Women's Entrepreneurship and Education
COBISS.SR-ID 157987852