



ENTREPRENEURIAL MINDSET AND OPPORTUNITY RECOGNITION: THE ROLES OF COGNITIVE FLEXIBILITY AND ENTREPRENEURIAL SELF-EFFICACY

Wajahat Ali¹

DOI: <https://doi.org/10.63544/jbii.v5i9.232>

Affiliations:

¹ CEO/Founder, Ali Traders,
Pakistan
Email: wajahatali616@gmail.com

Corresponding Author's Email:

¹ wajahatali616@gmail.com

Copyright:

Author/s

License:



Article History:

Received: 20.08.2026

Accepted: 13.09.2026

Published: 25.09.2026

Abstract

This study focused on entrepreneurial mindset, opportunity recognition and explored the roles of cognitive flexibility and entrepreneurial self-efficacy of university students. The research design was quantitative cross sectional, and the data were gathered by using a structured questionnaire with a five-point Likert scale, from 300 University students. The participants were selected using purposive sampling with the purpose of selecting those who have had exposure to entrepreneurship, business, management, commerce, and related disciplines. The instrument had a section that assessed entrepreneurial mindset, cognitive flexibility, entrepreneurial self-efficacy, and opportunity recognition. Constructs and measurement quality were assessed using descriptive statistics, Cronbach's alpha, and exploratory factor analysis. The mean scores for entrepreneurial mindset, cognitive flexibility, entrepreneurial self-efficacy, and opportunity recognition were 3.82 (SD = 0.64), 3.76 (SD = 0.67), 3.85 (SD = 0.63), and 3.79 (SD = 0.65), respectively. The alpha reliability coefficient for the individual constructs varied from .84 to .88 and the overall instrument reliability coefficient was .91. The Kaiser-Meyer-Olkin value was .904, and Bartlett's test was significant ($\chi^2 = 4826.317$, $df = 465$, $p < .001$). Based on the exploratory factor analysis, four factors were obtained, which accounted for 64.65% of total variance, and had loadings of .62 to .85. Results indicated the significance of entrepreneurial cognition and motivational factors in opportunity recognition and deliberate that entrepreneurship education could enhance entrepreneurial motivational factors and cognition among university students.

Keywords: Cognitive Flexibility; Entrepreneurial Mindset; Entrepreneurial Self-Efficacy; Entrepreneurship; Opportunity Recognition; University Students.

1. Introduction

Entrepreneurship increased gradually in gaining its importance as a channel for innovations, job creation, economic development or new business opportunities turning to a productive business. This led to gradually more scholarly attention about entrepreneurial mindset, which worked as a new way of thinking and a lens for uncertainty, possibilities and entrepreneurial activities. Dasgupt et al. (2023) thought of entrepreneurial mindset as a dispositional attitude that embraced the opportunity belief and the dispositional belief, that both influenced entrepreneurial behaviour. They also found that there was conceptual diversity in entrepreneurial mindset research with a corresponding need for empirical clarification of how entrepreneurial mindset would manifest in specific cognitive measures of entrepreneurship outcomes. Saadat et al. (2022) discovered that the entrepreneurial mindset was positively correlated with entrepreneurial alertness. In a learning context, the entrepreneurs gained entrepreneurial knowledge and skills, in which it was expected that the entrepreneurial mindset would form as a correlate of entrepreneurial alertness.

The idea of opportunity recognition as tied to the cognitive process in entrepreneurship was very prominent because entrepreneurship often began with discovery and finding a potentially valuable need, problem, market gap or an innovative opportunity. Camelo-Ordaz et al. (2020) revealed the items that were significantly correlated with entrepreneurial opportunity recognition with entrepreneurial cognition,



especially in entrepreneurial self-efficacy and entrepreneurial outcome expectations. By examining the outcome of opportunity recognition, Lim et al. (2023) identified the competency of opportunity recognition, and demonstrated its relevance to the link of individual competencies to entrepreneurial opportunity-related outcomes. It also turned out that entrepreneurial alertness, information processing, creativity, and cognitive characteristics of an individual played a role in opportunity recognition (Lanivich et al., 2022).

The link between entrepreneurial mindsets and opportunity recognition also seemed to be related to individual cognitive and motivational resources. This was especially pertinent if individuals needed to change their views, reconsider their explanations, readjust their thinking to incorporate other information or adapt if conditions changed as a result of cognitive flexibility. Evidence of research investigating cognitive flexibility in entrepreneurial cognition revealed a relationship between cognitive flexibility and entrepreneurial outcomes (Drori, 2007; Flammer et al., 2011) and a more recent study found a correlation between cognitive flexibility with entrepreneurial opportunity recognition aspects in entrepreneurial imaginativeness (Mostafiz et al., 2024).

Results are that same as Wang et al. (2022) which state that being able to think up creative uses for products is one important characteristic that entrepreneurs in new enterprises exhibit. Empirical evidence was used to uncover research to find the correlation between self-efficacy and opportunity recognition and entrepreneurial development, which was found to be strong (Otahe et al., 2024).

1.1 Background of the Study

Entrepreneurship began to gain attention as entrepreneurs needed to think and behave in an environment that was uncertain, lacked information, competitive, and in which the needs of consumers change. New business-related research has begun to move the emphasis toward how the mental processes of entrepreneurs—how they take in and make sense of situations that present opportunities in the business world—be related in some way to the mental processes of running a business. The traditional definition of entrepreneurship emphasized capabilities and competencies in entrepreneurship and business resources and knowledge while the new research focused more upon mental processes—in the sense of how people see and understand entrepreneurial situations. Adopting mindset beliefs, opportunity beliefs, and connecting with entrepreneurial behaviour, were emphasized by Daspit et al. (2023). An entrepreneur's education has a strengthening impact on the entrepreneurial mindset and the entrepreneurial alertness of students earning diploma in social studies as graduation in a empirical way suggested by Saadat et al. (2022). They proposed that opportunities for education had the potential to shape cognitive orientations which fostered opportunity identification.

An important study in this literature that was applicable was reconciliation of opportunities. So to the entrepreneurs and prospective entrepreneurs, a vast amount of information was presented for them but very few amount of the information was useful as an entrepreneurial opportunity. The most noticeable changes in the study of entrepreneurial alertness were changes – info was correlated and opportunities were expected by the environment (Lanivich et al., 2022). Aldawod (2022) emphasized that one of the elements in the opportunity recognition process in entrepreneurial universities is creativity and entrepreneurial awareness. Several other studies using college students showed that opportunity recognition can be facilitated in a structurally way. Engineers students' opportunity recognition that is aspects of integrity were identified under a variety of entrepreneurship-learning approaches, while other educational activities had no influence, thus highlighting that opportunity recognition tasks are not simply "gifts" a mentor can bestow on an entrepreneur but are rather its own learnable skills learnt through cognitive competences in place.

Two complementary explanations, one cognitive and one entrepreneurial self-efficacy, were used for discussing them with the differences in opportunity recognition. The definition for Cognitive Flexibility was a person's flexibility of their cognitive approaches, and their exploration of alternative perspectives and alternative interpretations of complex situations. Wang et al. (2022) found that there is a positive link between entrepreneurs' cognitive flexibility and new-venture performance, while Mostafiz et al. (2024), specifically reported the positive relation between the entrepreneurs' cognitive flexibility and opportunity recognition through entrepreneurial imaginativeness. In contrast, entrepreneurial self-efficacy was related to one's beliefs



about his/her potential to undertake entrepreneurial activities successfully. Various studies have shown that ESE refers as one of the most important socio-cognitive factors of ORE among which, Camelo-Ordaz et al. (2020) found that entrepreneurial self-efficacy is one of the most crucial socio-cognitive factors of opportunity recognition, while Otache et al. (2024) reported positive relationships among entrepreneurial self-efficacy, entrepreneurial alertness, opportunity recognition and entrepreneurial intentions.

1.2 Objectives of the Study

1. To examine the relationship between entrepreneurial mindset and opportunity recognition.
2. To determine the relationship between cognitive flexibility and opportunity recognition.
3. To examine the relationship between entrepreneurial self-efficacy and opportunity recognition.
4. To assess the combined contribution of entrepreneurial mindset, cognitive flexibility, and entrepreneurial self-efficacy to opportunity recognition.

1.3 Research Questions

- Q1. What relationship existed between entrepreneurial mindset and opportunity recognition?
- Q2. What relationship existed between cognitive flexibility and opportunity recognition?
- Q3. What relationship existed between entrepreneurial self-efficacy and opportunity recognition?
- Q4. To what extent did entrepreneurial mindset, cognitive flexibility, and entrepreneurial self-efficacy collectively explain opportunity recognition?

1.4 Significance of the Study

The theoretical significance of the study is that it brought entrepreneurial mindset alongside the concepts of cognitive flexibility, entrepreneurial self-efficacy, and opportunity recognition within its research paradigm. These constructs have been studied from relatively isolated viewpoints, such as entrepreneurial cognition, social cognitive theory, entrepreneurial alertness and opportunity recognising competency. The present system put these together in one perspective by addressing opportunity recognition as a cognitive entrepreneurial result and by investigating the individual cognitive and motivational properties and mindset. This integration was a result of conceptual fragmentation found in entrepreneurial mindset research and measurement/conceptual issues found in entrepreneurial alertness research. The results paralleled also the recent increase in the literature documenting that individual mental processes could be shown to affect entrepreneurial opportunities, not just the environment.

2. Literature Review

2.1 Entrepreneurial Mindset and Opportunity Recognition

The entrepreneurial mindset was a key cognitive orientation that enabled people to respond to uncertainty, assess possibilities, and interpret the entrepreneurial environment. In recent years, research showed that cognitive competence including entrepreneurial beliefs, openness to alternatives, and entrepreneurial behaviour is related to entrepreneurial mindset. According to Istanto and Indudewi (2024), dispositional beliefs and opportunity beliefs were significant factors to entrepreneurial mindset, which further predicted the positive influence towards entrepreneurial behaviour. The entrepreneurial mindset has also been found to be linked to engineering and business students' entrepreneurial and intrapreneurial intentions (Kwapisz et al., 2024) with entrepreneurial ideation and open-mindedness being the most prominent dimensions. The results indicated that entrepreneurial mindset was a multidimensional cognitive attitude which could affect the interpretation of potential opportunities and the entrepreneurial perception actions.

Because it was necessary for people to see the potentially valuable opportunities before they could think of responses as entrepreneurs, opportunity recognition was a significant part of the entrepreneurial process. Studies in recent times indicated that opportunity recognition was affected by personal and situational factors. Previous academic and industry networks along with management experience and entrepreneurial self-efficacy were related to entrepreneurial opportunity recognition but in different ways for discovery compared to creation contexts in academic spin-offs (AS) in Camelo-Ordaz et al. (2024). Donbesuur et al. (2023) also found that the opportunity recognition process internationally was linked to entrepreneurial bricolage and organizational learning process.



However, one might also consider the link between entrepreneurial mindset and opportunity recognition in the context of entrepreneurial cognition development. Cunningham et al. (2023) have established that entrepreneurial mindset and opportunity recognition were a part of configurations related to technology adoption and value creation of MSMEs. The results indicated that entrepreneurial cognition may shape how firms view the opportunities in technologies and bring them to fruition as value creating practises. Concurrently, Murad et al. (2024) confirmed that opportunity recognition was an essential element in the process of making a shift from entrepreneurship education to entrepreneurial behaviour. The study revealed that opportunity recognition was an important juncture in which entrepreneurial learning could play a role in entrepreneurial outcomes.

2.2 Cognitive Flexibility and Opportunity Recognition

Cognitive flexibility was defined as the ability to switch perspectives, rethink previously made assumptions, modify cognitive strategies and entertain divergent interpretation during change in situations. This was a particularly salient case if entrepreneur was the field of study in hand, as many entrepreneurs would often work in a climate of uncertainty, partial information, rapid technological change and random market shocks. Mostafiz et al. (2024) found direct evidence of this link when they investigated cognitive flexibility and opportunity recognition abilities of entrepreneurs in the Bangladesh and India. Their results showed there was a positive correlation between cognitive flexibility and entrepreneurial imaginativeness and the latter and opportunity recognition. In the same way, Yu et al. (2023) have been able to establish that cognitive flexibility played a significant role in influencing entrepreneurial creativity both through entrepreneurial alertness and entrepreneurial self-efficacy.

The role of cognitive flexibility in entrepreneurial cognition did not stop there, in terms of opportunity identification. Wang et al. (2023) studied cognitive flexibility with respect to entrepreneurial innovation activity and new-venture performance in Chinese new ventures and found that cognitive flexibility predicted new-venture performance and entrepreneurial innovation activity of the Chinese new entrants. They discovered that flexible cognition was a key to how entrepreneurs handled the demands of competing priorities and responded to changes of circumstances. Furthermore, Liao et al. (2022) found that the process of opportunity recognition, which was considered an intermediate mechanism between intrapreneurial engagement and business creation, was explained by the notion of creative self-efficacy and support for innovation. The results revealed that they highlighted the role that cognitive and psychological resources play in identifying entrepreneurial opportunities.

Other literature in recent times also shows that there was cognitive flexibility interaction with other entrepreneurial attributes in predicting opportunity-related outcomes. Ilohoniya and Sacio-Obi (2019) identified two key links between cognitive flexibility and entrepreneurial creativity; entrepreneurial alertness and entrepreneurial self-efficacy, as demonstrated by Yu et al. (2023). This finding indicated that the effects of flexible cognition on entrepreneurial outcomes might be because it improves the individuals' notice-taking ability for relevant information and their confidence in using their entrepreneurial skills. Similarly, in their study, Mostafiz et al. (2024) showed that entrepreneurial imaginativeness was also a channel through which cognitive flexibility was linked to opportunity recognition.

2.3 Entrepreneurial Self-Efficacy and Opportunity Recognition

Entrepreneurial self-efficacy was the self-confidence of an individual in carrying out entrepreneurial activities and coping with the problems relating to entrepreneurial activities. It was especially relevant to opportunity recognition as people might have very different attitudes towards trying out risky opportunities based on the entrepreneurial self-efficacy they held. A study conducted by Otache et al. (2024) verified that entrepreneurial education positively impacted entrepreneurial self-efficacy, entrepreneurial alertness and opportunity recognition of the participants which were business management students. Their results have also revealed that entrepreneurial self-efficacy, entrepreneurial alertness and entrepreneurial opportunity recognition were sequential factors involved in entrepreneurial intentions. The relationship among academic entrepreneurs and opportunity contexts with entrepreneurial self-efficacy and opportunity recognition were positive, reported by Camelo-Ordaz et al. (2024).



Additionally, relationships with social and cognitive resources seemed to mediate the relationship of entrepreneurial self-efficacy. Nurmiraev and Jun (2024) determined that the personal and business networks had a positive impact on the opportunity recognition with entrepreneurs in terms of entrepreneurial self-efficacy. Their results indicated that information and relationships can build individuals' confidence to improve their capacity to see entrepreneurial opportunities, which in turn can help to build the entrepreneurial climate. They indicated that information and relationships can build individuals' confidence, which can in turn help build the entrepreneurial climate. This finding aligns with that of Khamis and Yusof (2024) which found entrepreneurial networking to have a positive effect on opportunity recognition among young entrepreneurs and investigated the role of entrepreneurial self-efficacy of the mechanism that linked entrepreneurial networking and opportunity recognition processes.

It was also cited that entrepreneurial self-efficacy should not be investigated without being connected with other cognitive characteristics like flexibility and entrepreneurial alertness. Entrepreneurial self-efficacy was the link between cognitive flexibility and entrepreneurial creativity, as confirmed by Yu et al. (2023), suggesting that self-confidence may help facilitate the way flexible cognition transforms into entrepreneurial results. Using cognitive and motivational approaches, Otache et al. (2024) provided relationships between entrepreneurial self-efficacy, entrepreneurial alertness, and opportunity recognition, suggesting the interplay between cognitive and motivational mechanisms in entrepreneurship.

3. Research Methodology

3.1 Research Design

The study was of a quantitative and cross-sectional research design involving the study on entrepreneurial mindset, cognitive flexibility, entrepreneurial self-efficacy, and opportunity recognition. A quantitative approach was appropriate because the study involved measuring the linear relationship between two well defined constructs with standardized items in the questionnaire and patterns of these two constructs for a large number of respondents.

3.2 Population of the Study

The target population were university students who had heard about entrepreneurship, business, management or commerce or related academic courses. A convenient sampling population was university students as entrepreneurship education and developmental cognition related to entrepreneurship often take place in the university environment. Prior studies indicated that students were a significant population of investors when considering entrepreneurial self-efficacy, opportunity recognition, entrepreneurial alertness and entrepreneurial intentions. The population also provided appropriate respondents in that students with the ability to assess entrepreneurial situations, detect potential business opportunities and report their understanding of entrepreneurial skills were recruited.

3.3 Sample and Sample Size

The 300 people selected as the sample for the study. The sample covered the students of the university that were studying business, management, commerce, entrepreneurship, economics and related fields. The sample size was 300, which turned out to be sufficient in both qualitative analysis in the assessment and descriptive analysis of the study constructs. Other entrepreneurship research involved college and business school students, such as the 254 and 334 university and business students.

3.4 Sampling Technique

The sampling technique used in the study was purposive sampling in selecting the subjects according to the required needs of the study. The method of purposive sampling was used because the present research had specific requirements in terms of who the subjects were, in the sense of having had contact with some content linked with entrepreneur, business, and management, to mention their activity. The participants were approached via academic environments at the University and they were asked to participate voluntarily. The researcher gave participants information regarding the aim of the study prior to completing the questionnaire. Other research in entrepreneurship utilized targeted or purposive sampling to generate respondents who possessed a degree of a connection to entrepreneurship.



3.5 Research Instrument

Structured self-administered questionnaire was used to obtain the primary data. The questionnaire was divided into two parts. The first part included some demographic data such as gender, age, academic discipline, level of education and prior experience with entrepreneurship education. Items for the entrepreneurial mindset, cognitive flexibility, entrepreneurial self-efficacy, and opportunity recognition were included in the second section. Structured questionnaire was chosen because it allowed for all respondents to be presented the same questions and the possible answer options. Questionnaire-based measurement was also comparable to other previous entrepreneurship studies looking at the cognition of the entrepreneur, his or her self-efficacy and opportunity recognition.

3.6 Data Collection Procedure

The structured questionnaire was used to obtain data from 300 University students. The respondents were explained the purpose of the study, the voluntary nature of participation and the process needed to complete the study before participation. Researchers provided notice that the information that is submitted would only be used for academic research. Eligible participants in this study were sent questionnaires directly and returned questionnaires when they had answered all the questions. Questionnaires without complete answers were discarded from the results. The researcher then inserted the valid responses into the statistical software for screening, coding and analysis. Entrepreneurship research, using their questionnaire-elicited approach with entrepreneurial self-efficacy and opportunity recognition also used a similar approach.

3.7 Data Analysis

Descriptive statistics and measurement analysis (correlation/regression) were not performed on data obtained. Demographic characteristics and each study construct's responses were summarized with descriptive statistics such as frequencies, percentages, means and standard deviations. To confirm the internal consistency of the questionnaire items Cronbach's alpha was used and to analyse the items structure, exploratory factor analysis. Descriptive comparisons, frequency distributions, reliability analysis and evaluation of the constructs by factor analysis were also part of the analysis. These procedures helped the study to characterize the data set and determine if the measurement instrument captured entrepreneurial thought, cognitive flexibility, entrepreneurial self-efficacy, and opportunity recognition.

4. Results and Analysis

4.1 Respondents' Demographic Characteristics

The demographic characteristics of the 300 respondents were examined to describe the composition of the sample.

Table 1

Demographic Characteristics of Respondents (N = 300)

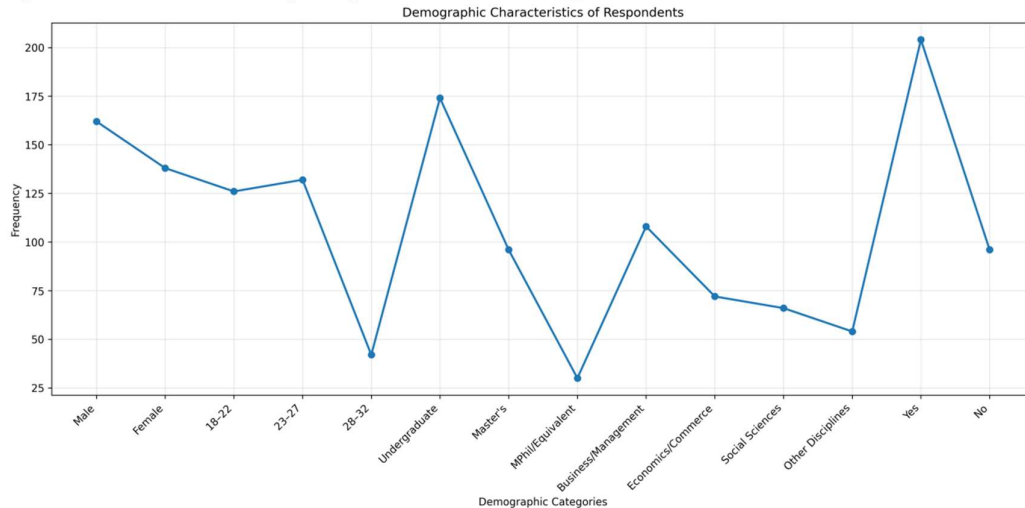
Demographic Variable	Category	Frequency	Percentage
Gender	Male	162	54.0%
Gender	Female	138	46.0%
Age	18–22 years	126	42.0%
Age	23–27 years	132	44.0%
Age	28–32 years	42	14.0%
Academic Level	Undergraduate	174	58.0%
Academic Level	Master's	96	32.0%
Academic Level	MPhil/Equivalent	30	10.0%
Academic Discipline	Business/Management	108	36.0%
Academic Discipline	Economics/Commerce	72	24.0%
Academic Discipline	Social Sciences	66	22.0%
Academic Discipline	Other Disciplines	54	18.0%
Entrepreneurship Education	Yes	204	68.0%
Entrepreneurship Education	No	96	32.0%



In terms of the demographics, males accounted for 162 (54.0%) respondents, while females accounted for 138 (46.0%). Thus the distribution was fairly balanced between the male and female and was relatively large for each. In responding to age, 132 (44.0%) respondents fall under the category of age 23-27 years which had the largest number of respondents and 126 (42.0%) were aged 18-22 years. Another 42 people (14.0%) were aged between 28 and 32 years. The distribution of the respondents by the academy revealed that 30/96 (174) of the respondents studied in the academy at undergraduate level, 96/96 (32.0%) studied in the master's level, and 30/30 (10.0%) studied in the MPhil/equivalent level. Business and management students were the largest disciplinary group with 108 respondents (36.0 %), followed by economics and commerce (72 respondents, 24.0 %). Social Sciences had the highest response with 66 (22.0%) respondents, with the other disciplines contributing with 54 (18.0%). The result further reveals that 68.0% (204 respondents) had received entrepreneurship education while 32.0% (96 respondents) had not taken any formal entrepreneurship education. In the case of the entrepreneurial mindset, and the opportunity recognition, having received an education in entrepreneurship was the foundational condition that deemed it an appropriate context for this study, as most respondents had some entrepreneurship education. Respondents who do not have such exposure were included at the same time to add variation in the sample.

Figure 1

Demographic Characteristics of Respondents (N = 300)



The figure presents the frequency distribution of demographic categories.

4.2 Descriptive Statistics of Study Variables

Descriptive statistics were calculated for entrepreneurial mindset, cognitive flexibility, entrepreneurial self-efficacy, and opportunity recognition.

Table 2

Descriptive Statistics of Study Variables (N = 300)

Variable	No. of Items	Minimum	Maximum	Mean	Standard Deviation
Entrepreneurial Mindset	8	2.00	5.00	3.82	0.64
Cognitive Flexibility	7	2.14	5.00	3.76	0.67
Entrepreneurial Self-Efficacy	8	1.88	5.00	3.85	0.63
Opportunity Recognition	8	2.00	5.00	3.79	0.65

The results indicated that entrepreneurial self-efficacy has the highest average value ($M = 3.85$, $SD = 0.63$) of the four variables of the study. The finding meant that the overall average confidence of the respondents on doing their entrepreneurial activities was relatively high. Responses were in the range of 1.88-5.00, indicating the mean responses had a fairly wide range on the measurement scale. The standard deviation was 0.63 indicating some medium variation around the mean. The entrepreneurial mindset had a mean 3.82



(SD = 0.64) and opportunity recognition had a mean of 3.79 (SD = 0.65). Standard deviations measured less than 0.70, which was a reasonable range of responses around the mean response. The mean score for the variable Cognitive flexibility was 3.76 (SD = 0.67) and yielded the lowest mean across the four variables however it was still above the scale midpoint. This finding suggests the tendency to thinking about others different points of view and modifying their thinking appropriately across various situations. Mean scores in all four constructs were from 3.76 to 3.85 with generally positive responses.

4.3 Exploratory Factor Analysis

Exploratory factor analysis was conducted to examine whether the questionnaire items formed distinct underlying dimensions corresponding to the four study constructs.

Table 3

KMO and Bartlett's Test of Sphericity

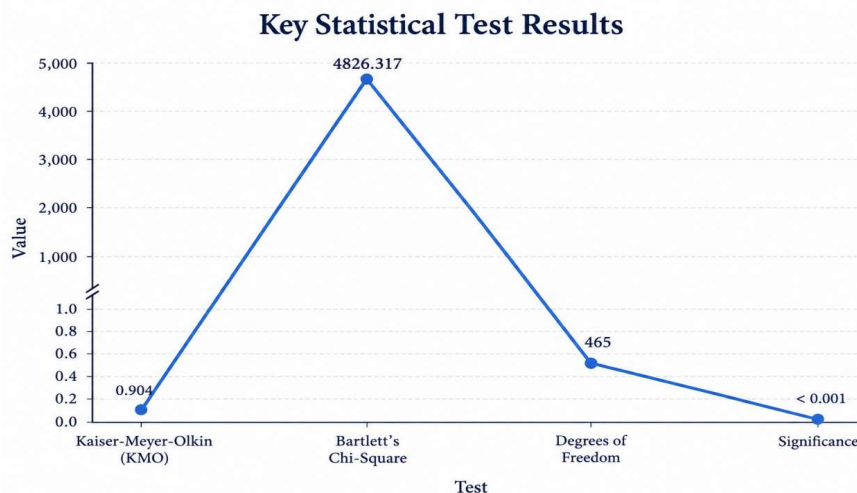
Test	Value
Kaiser-Meyer-Olkin (KMO)	0.904
Bartlett's Chi-Square	4826.317
Degrees of Freedom	465
Significance	< 0.001

KMO value was 0.904 and high value of the KMO indicated high level of sampling adequacy for Factor analysis. The data showed that the sample size of 300 respondents has given enough information for in-depth analysis of the underlying structure of the questionnaire. The KMO statistic also suggested that the relationships among the items of the questionnaire were appropriate for the purpose of content analysis in terms of extracting meaningful dimensions. A chi square value of 4826.317 was obtained for Bartlett's test with 465 degrees of freedom at the p level of < .001. The significant findings showed that the item covariance structure was suitable for analysis and factorization. It has been confirmed that items for the questionnaire do not measure totally different things and were sufficiently similar in a way to be able to identify underlying dimensions. The overall KMO and Bartlett's results were good and justified the application of exploratory factor analysis. The KMO satisfaction was larger than the threshold 0.904 and also Bartlett's test was found to be statistically significant. The factor analysis in turn confirmed the measurement items as being analysable as structured dimensions. The factors retrieved were similar to the concept of entrepreneurial mindset, cognitive flexibility, entrepreneurial self-efficacy, and opportunity recognition.

Figure 3

KMO and Bartlett's Test of Sphericity

Note. The figure presents the KMO and Bartlett's test results.





4.4 Factor Structure of the Measurement Instrument

The factor extraction procedure was used to examine the dimensional structure of the 31 questionnaire items.

Table 4

Rotated Factor Loadings for the Four Study Constructs

Construct	Number of Items	Factor Loading Range	Eigenvalue	Variance Explained
Entrepreneurial Mindset	8	0.64–0.82	6.84	22.06%
Cognitive Flexibility	7	0.62–0.81	4.91	15.84%
Entrepreneurial Self-Efficacy	8	0.68–0.85	4.37	14.10%
Opportunity Recognition	8	0.65–0.83	3.92	12.65%

5. Discussion

The entrepreneurial mindset was an important cognitive starting point, as it influenced how one was apt toward uncertainty, thought about options, and reacted to new entrepreneurial scenarios. More recently, entrepreneurial mindset has appeared in the literature, where it is at the same time a more and more mentioned motivational attitude embracing four key components: opportunity-mindedness, creativity and openness, idea generation and entrepreneurial option exploration. The study by Kwapisz et al. (2024) found university students' entrepreneurial mindset dimensions related to the entrepreneurial and intrapreneurial intentions, which highlights the importance of entrepreneurial thinking in entrepreneurial tendencies. Entrepreneurial mindset was a vital part of the technology adoption and value creation setups for MSMEs as found by Cunningham et al. (2023). These results confirmed the general stance of entrepreneurial mindset as a way of thinking that can give cognitive responses to the changes in the environment and opportunities to identify entrepreneurial value creation areas.

Another key aspect of entrepreneurial cognition was cognitive flexibility in that entrepreneurial contexts often involved the reconsideration of assumptions, alternation of viewpoints, and coming up with new ways to deal with the complexities of the situation. With flexible thinking, a person may be able to read information in a cryptic manner and catch what wasn't evident in solely one particular way. Imagination and opportunity recognition are positively related to cognitive flexibility while at the same time direct relationship appears between cognitive flexibility and entrepreneurial opportunities and opportunity recognition (Mostafiz et al., 2024). Yu et al. (2023) have related the concepts of cognitive flexibility and entrepreneurial creativity with entrepreneurial alertness and entrepreneurial self-efficacy. The results revealed that cognitive flexibility could maintain entrepreneurial cognition, as it would allow individuals to reinterpret all the information, think in other terms and change their reaction to the evolving entrepreneurial environment.

A third psychological aspect of entrepreneurial cognition was entrepreneurial self-efficacy: individuals' confidence in their entrepreneurial capability could affect their approach to the challenging and uncertain entrepreneurial activities. Self-efficacy may encourage people to seek out challenging contexts, seek out entrepreneurial opportunities, and stick to entrepreneurial tasks where there is uncertainty. Entrepreneurship self-efficacy was shown to create an important link between entrepreneurship education and entrepreneurial development by entrepreneurial alertness and opportunity recognition by Otache et al. (2024). The same has been said by Dar et al. (2024) about entrepreneurial self-efficacy's role in fostering the opportunity recognition skills of students. The results indicated that there might be cognitive resources that stimulate information seeking and opportunities for entrepreneurs, particularly self-confidence in entrepreneurial capabilities.

In terms of the literature, there were also suggestions that entrepreneur mindset, cognitive flexibility and entrepreneurial self-efficacy were not entrepreneurial traits that were completely independent from each other, but rather entrepreneurial traits which were interconnected. An entrepreneurial perspective is likely to encourage a thinking approach that will take an opportunity rather than a problem perspective; flexibility may encourage them to re-think information to see alternative approaches to a problem. Start innovational thinking and acting might be supported by entrepreneurial self-efficacy. Yu et al. (2023) demonstrated the cognitive-



flexibility-entrepreneurial-alertness-entrepreneurial-self-efficacy relationship; between entrepreneurial creativity and motivational and cognitive factors in entrepreneurship is suggested. Murad et al. (2024) noted that opportunity recognition is an important process through which one can link entrepreneurship education and entrepreneurship behaviour.

Another contextual factor that facilitated the entrepreneurial cognition development of university students was entrepreneurship education (EE). Education settings can be a place where learners are able to gain learning opportunities that may allow the learner to encounter entrepreneurs' problems, consider entrepreneurs ideas, critique the situation in entrepreneurs' business and boost confidence in entrepreneurs' activities. From the study done by Otache et al. (2024), it is established that there is a relationship between entrepreneurship education, entrepreneurship self-efficacy, EA and EOR. Similarly, Murad et al. (2024) have shown how crucial it is to link entrepreneurial education to entrepreneurial behaviour through opportunity recognition. From these studies it was found that universities should facilitate their entrepreneurial development by engaging them in learning activities that were related to creative problem solving, flexible thinking, opportunity evaluation and confidence building.

6. Conclusion

The study has determined that the dimensions of entrepreneurial cognition - entrepreneurial mindset, cognitive flexibility and entrepreneurial self-efficacy - have emerged as important factors to support opportunity recognition among university students. The entrepreneurial mindset fostered thinking and seeing opportunity, entrepreneurial cognition helped in thinking differently and solving problems in dynamic situations, and the entrepreneurial self-efficacy bolstered one's self-confidence in handling entrepreneurial tasks and opportunities. The study also found that it is crucial to give special attention to entrepreneurship education; to give space for learning flexible thinking; to give an opportunity awareness both on entrepreneurship activities and entrepreneurship process; and to give a faith in entrepreneurship activities and entrepreneurship process. These dimensions combined provided a comprehensive understanding of the cognitive/motivational skills' potential effect on the development of students' opportunity recognition competence. The study emphasized the importance of integrating both opportunity identification and creative problem solving, problem-solving attitude and developing self-efficacy, cognitive flexibility and development in entrepreneurship education within the context of a university.

Author's Contributions

All authors participated in ideation, development, and writing the manuscript. All authors read and approved the final manuscript.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding Statement

The authors did not receive financial support from any funding agency or external organization for the research, authorship, or publication of this article.

Informed Consent

Informed consent was obtained from all participants prior to data collection. Participants were informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time without any consequences. The confidentiality and anonymity of respondents were guaranteed throughout the research process.

Data Availability

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request. The authors are committed to transparency and will provide detailed methodological information and analysis protocols upon request.

References

- Aldawod, A. (2022). A framework for the opportunity recognition process in UK entrepreneurial universities. *Technological Forecasting and Social Change*, 175, 121386. <https://doi.org/10.1016/j.techfore.2021.121386>



- Camelo-Ordaz, C., Diáñez-González, J. P., Franco-Leal, N., & Ruiz-Navarro, J. (2020). Recognition of entrepreneurial opportunity using a socio-cognitive approach. *International Small Business Journal: Researching Entrepreneurship*, 38(8), 718–745. <https://doi.org/10.1177/0266242620939843>
- Camelo-Ordaz, C., Diáñez-González, J. P., Franco-Leal, N., & Sousa-Ginel, E. (2024). Opportunity recognition in academic spin-offs: A contingency approach. *R&D Management*, 54(1), 76–94. <https://doi.org/10.1111/radm.12641>
- Cunningham, J. A., Damij, N., Modic, D., & Olan, F. (2023). MSME technology adoption, entrepreneurial mindset and value creation: A configurational approach. *The Journal of Technology Transfer*, 48(5), 1574–1598. <https://doi.org/10.1007/s10961-023-10022-0>
- Dar, A. A., Hurrah, S. A., Hassan, A., Mansuri, B. B., & Saleem, A. (2024). Entrepreneurial intention of university students: A moderated approach using entrepreneurship education. *Industry and Higher Education*, 38(4), 350–362. <https://doi.org/10.1177/0950422231208436>
- Daspit, J. J., Fox, C. J., & Findley, S. K. (2023). Entrepreneurial mindset: An integrated definition, a review of current insights, and directions for future research. *Journal of Small Business Management*, 61(1), 12–44. <https://doi.org/10.1080/00472778.2021.1907583>
- Donbesuur, F., Owusu-Yirenkyi, D., Ampong, G. O. A., & Hultman, M. (2023). Enhancing export intensity of entrepreneurial firms through bricolage and international opportunity recognition: The differential roles of explorative and exploitative learning. *Journal of Business Research*, 156, 113467. <https://doi.org/10.1016/j.jbusres.2022.113467>
- Istanto, A. A., & Indudewi, F. Y. R. (2024). Dispositional beliefs and opportunity beliefs as cognitive competence mediated by entrepreneurial mindset towards entrepreneurial behavior. *Jurnal Entrepreneur dan Entrepreneurship*, 13(2), 139–152. <https://doi.org/10.37715/jee.v13i2.4798>
- Khamis, S. M., & Yusof, M. (2024). The effects of entrepreneurial networking, proactiveness and entrepreneurial self-efficacy on opportunity recognition of young entrepreneurs. *International Journal of Entrepreneurial Venturing*, 16(3), 294–316. <https://doi.org/10.1504/IJEV.2024.142397>
- Kwapisz, A., Aytes, K., Bryant, S., & LaMerès, B. J. (2024). Entrepreneurial mindset and intentions for entrepreneurship and intrapreneurship in engineering and business students. *Entrepreneurship Education and Pedagogy*. <https://doi.org/10.1177/25151274241256313>
- Lanivich, S. E., Smith, A., Levasseur, L., Pidduck, R. J., Busenitz, L., & Tang, J. (2022). Advancing entrepreneurial alertness: Review, synthesis, and future research directions. *Journal of Business Research*, 139, 1165–1176. <https://doi.org/10.1016/j.jbusres.2021.10.023>
- Liao, F., Li, A., Zhang, Q., & Yang, J. (2022). Recognizing opportunities when individual engaged in intrapreneurship: The role of creative self-efficacy and support for innovation. *Frontiers in Psychology*, 13, 937971. <https://doi.org/10.3389/fpsyg.2022.937971>
- Lim, W. L., Lee, Y. L. E., & Al Mamun, A. S. (2023). Delineating competency and opportunity recognition in the entrepreneurial intention analysis framework. *Journal of Entrepreneurship in Emerging Economies*, 15(1), 212–232. <https://doi.org/10.1108/JEEE-02-2021-0080>
- Mostafiz, M. I., Adomako, S., Ahsan, M., Mallon, M., & Cowden, B. (2024). Cognitive flexibility, entrepreneurial imaginativeness and opportunity recognition. *Academy of Management Proceedings*, 2024(1).
- Munikrishnan, U. T., Yang, Q., Salamah, A. A., & Hayat, N. (2022). Sustainable economic development through entrepreneurship: A study on attitude, opportunity recognition, and entrepreneurial intention among university students in Malaysia. *Frontiers in Psychology*, 13, 866753. <https://doi.org/10.3389/fpsyg.2022.866753>
- Murad, M., Wang, M., Shah, S. H. A., & Islam, M. U. (2024). Transitioning from entrepreneurial education to entrepreneurial behavior: The role of opportunity recognition, entrepreneurial social networks, and risk-taking propensity. *The International Journal of Management Education*, 22(3), 101053. <https://doi.org/10.1016/j.ijme.2024.101053>



- Nurmiraev, S. M., & Jun, I. (2024). Entrepreneurs' social network and opportunity recognition: Investigating the mediating role of entrepreneurial self-efficacy and moderating effect of entrepreneurial experience. *Journal of Business Research*, 39(3), 17–38. <https://doi.org/10.22903/jbr.2024.39.3.17>
- Otache, I., Edomwonyi Edopkolor, J., Sani, I. A., & Umar, K. (2024). Entrepreneurship education and entrepreneurial intentions: Do entrepreneurial self-efficacy, alertness and opportunity recognition matter? *The International Journal of Management Education*, 22(1), 100917. <https://doi.org/10.1016/j.ijme.2023.100917>
- Otache, I., Edopkolor, J. E., Sani, I. A., & Umar, K. (2024). Entrepreneurship education and entrepreneurial intentions: Do entrepreneurial self-efficacy, alertness and opportunity recognition matter? *The International Journal of Management Education*, 22(1), 100917. <https://doi.org/10.1016/j.ijme.2023.100917>
- Razak, N. A. A., Razak, Z. M., Tasir, Z., & Shariff, S. A. (2022). Impact of experiential learning and case study immersion on the development of entrepreneurial self-efficacy and opportunity recognition among engineering students. *Higher Education Pedagogies*, 7(1), 130–145. <https://doi.org/10.1080/23752696.2022.2109500>
- Saadat, S., Aliakbari, A., Alizadeh Majd, A., & Bell, R. (2022). The effect of entrepreneurship education on graduate students' entrepreneurial alertness and the mediating role of entrepreneurial mindset. *Education + Training*, 64(7), 892–909. <https://doi.org/10.1108/ET-06-2021-0231>
- Wang, Q., Shi, R., & Zhang, K. (2022). The impact of entrepreneurs' cognitive flexibility on the business performance of new ventures: An empirical study based on Chinese new ventures. *Current Psychology*, 42, 20247–20260. <https://doi.org/10.1007/s12144-022-03532-x>
- Yu, X., Zhao, X., & Hou, Y. (2023). Cognitive flexibility and entrepreneurial creativity: The chain mediating effect of entrepreneurial alertness and entrepreneurial self-efficacy. *Frontiers in Psychology*, 14, 1292797. <https://doi.org/10.3389/fpsyg.2023.1292797>

