Sustainable Innovation, Entrepreneurial Mindset and Attitude of Students in Application-Oriented Undergraduate Universities

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Abstract – *This study explored the relationship between sustainable innovation, entrepreneurial mindset and attitude of students among students in application-oriented undergraduate universities in Henan Province, China. The research design is descriptive research. The survey targets 10 universities, with 70 sample respondents from each university. The Henan Provincial Department of Education requires all universities to build demonstration schools to enhance higher education's ability to serve regional economic and social development. A researcher-made questionnaire was used to collect data on sustainable innovation, entrepreneurial mindset, and attitude among students. This study found that students have a positive attitude towards sustainable innovation efforts in various dimensions, with a generally optimistic entrepreneurial attitude and a positive overall entrepreneurial attitude. These findings highlight the potential of students to stand out in entrepreneurship and make meaningful contributions to future innovation initiatives. The significant correlation between different dimensions of sustainable innovation and entrepreneurial attitudes highlights the complex relationship between sustainable practice and entrepreneurial attitudes. The correlation between entrepreneurial mentality and entrepreneurial attitude emphasizes the multidimensional nature of entrepreneurial behavior and the complex interaction between psychological attributes and entrepreneurial success. It is recommended that educators focus on cultivating students' innovative thinking and practical abilities in daily teaching, guiding them to pay attention to the development dynamics of innovation and entrepreneurship, and expanding their horizons and ideas.*

Keywords *– Undergraduate students, Innovation, Entrepreneurship, programme.*

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INTRODUCTION

In recent years, with the acceleration of the popularization process of higher education in China, local applied undergraduate universities have actively explored the reform of talent cultivation models. Innovation and entrepreneurship education, as an important component of talent cultivation, has received widespread attention. The cultivation of innovation and entrepreneurship abilities among local applied undergraduate students is of great significance for promoting employment and entrepreneurship among college graduates and promoting local economic development [1].

Sustainable innovation was increasingly important in shaping the way corporate leaders think about the world. As future business owners and students, gain greater exposured to the corporate environment, this notion must gradually integrate through a sound education transformation. This could open up their way to a broader mindset and attitude. It must be understood that, tn the verge of the industrial era, business leaders expect new perspectives from young entrepreneurs. Sustainable innovation as characterized by its capacity to generate positive environmental, social, and economic impacts, transcends traditional boundaries, represents a powerful force for addressing contemporary global challenges and issues [2] [3]. It underscores the need for novel solutions that not only spur economic growth but also safeguard the environment and promote social equity. Thus, this new idea is now expected an integral part of the educational system.

The entrepreneurial mindset was a crucial aspect of success in today's competitive business environment. It involves a proactive approach to decision-making, a willingness to take risks, tolerance, confidence, and the

ability to see opportunities. This mindset was essential for people's decision-making and success in chasing possibilities. It encompasses characteristics like willingness to take risks, tolerance, confidence, and the ability to see opportunities. Education and experience learning were given priority to cultivate entrepreneurial skills, augmenting individuals' capacities and improving their prospects for success in entrepreneurial endeavors.

The integration of entrepreneurship concepts into higher education institutions has gained momentum in recent years as institutions strive to produce graduates who are equipped to navigate the complex and dynamic landscape of the modern workforce. Entrepreneurship education was increasingly being adopted as a comprehensive strategy to promote an entrepreneurial mindset and develop entrepreneurial skills among students in various educational settings and academic levels. China has seen a significant increase in entrepreneurship over the past 20 years, driven by non-state-owned enterprises and the Silicon Valley culture. The entrepreneurial mindset was essential for people's decision-making and success in chasing possibilities, encompassing characteristics like willingness to take risks, tolerance, confidence, and the ability to see opportunities. Embracing the entrepreneurial mindset involves adopting the behaviors and cognitive processes of an entrepreneur, such as self-control, emphasis on optimal choices, flexible implementation, and active involvement with all stakeholders in their field. Engaging in self-reflection on challenges and desired goals can uncover underlying beliefs and absorb new empowering ideas [4] [5].

The entrepreneurial attitude has been identified as a significant catalyst for both innovation and economic growth [6]. Entrepreneurship involves a collection of characteristics, such as willingness to take risks, confidence in oneself, ability to see opportunities, and a tendency to work for oneself. Developing an entrepreneurial mentality is crucial for those aiming to succeed in the current highly competitive environment, whether in their professional endeavors or as entrepreneurial leaders [4].

Furthermore, the actions and intentions of individuals were profoundly influenced by their attitudes towards entrepreneurship [7]. Many factors, including social networks, education, and family history, might impact an individual's inclination for entrepreneurship [8]. Understanding the complex relationship between these characteristics and attitudes is essential, as it provides significant insights into the potential for developing an entrepreneurial environment.

This study will explore the context of ten application-oriented undergraduate universities in Henan Province, China. It will seek to understand the relationship between sustainable innovation, the entrepreneurial mindset, and the attitudes of students. The study will reveal the important connections and implications that these variables have for the educational landscape and the broader socio-economic fabric of China.

The research stands firm on the idea that sustainable innovation is a global priority. Thus, understanding its relationship with education is crucial. Discovering effective strategies can contribute to the development of a skilled workforce capable of driving sustainable development. This significance of this lies in its potential to inform and shape educational practices, policies, and strategies in Henan Province's educational system.

Given the growing importance of sustainability in addressing global issues like climate change and resource depletion, this research aims to provide insights on how universities may promote sustainable innovation. Universities may utilize this information to foster an environment of creativity that incorporates sustainability principles, in order to promote more sustainable practices across many industries.

OBJECTIVES OF THE STUDY

This paper focuses on the development of innovation and entrepreneurship abilities among applied undergraduate students in Henan Province, and explores the relationship of sustainable innovation, entrepreneurial mindsets, and entrepreneurial attitudes among students.

Specifically, it aimed to describe the profile of students in application-oriented undergraduate universities in Henan province of China in terms of sex, year of level and program; determine the extent of sustainable innovation of students in terms of Collaboration, knowledge sharing, school culture, leadership and support and feedback; assess the entrepreneurial mindset in terms of solutions-oriented, adaptability, anti-Fragility, originality and inventiveness; identify attitude of student in application-oriented undergraduate universities in terms of opportunity exploration, risk management, innovative thinking, action orientation, customer-centricity, open-mindedness and resourcefulness; test the significant differences of the responses of students when grouped according to the profile variables; test the significant relationship among the sustainable innovation, entrepreneurial mindset, and attitude of student in

application-oriented undergraduate universities, and propose a development program based on the results of the study.

MATERIALS AND METHODS

Research Design

The research design for this study is descriptive design. This design is selected to investigate the relationship between sustainable innovation and the entrepreneurial mindset and attitude of students within ten application-oriented undergraduate universities in Henan, China.

The research design is involve collecting numerical data through surveys and questionnaires to measure the variables of interest. It is employ a comparative approach by examining and comparing different groups of respondents based on their profiles, including sex, year level, and program of study. This approach is help address research questions 1, 5, 6, and 7, which focus on differences in the assessment of sustainable innovation and entrepreneurial mindset and attitude based on respondent profiles.

Furthermore, a correlational approach is used to analyze the relationships between sustainable innovation and the entrepreneurial mindset and attitude of students.

Respondents of the Study

The participants of this study are students from applied undergraduate universities in Henan Province, China. Researchers used Raosoft with a 95% confidence interval and a 5% error range to determine sample size. The sample size calculated from the total population of 10 universities is 699 people. These participants are freshmen to seniors. Due to data collection being done through Google spreadsheets, researchers have been continuously monitoring responses until the required number of responses is reached. After meeting the required number of respondents, the researchers locked onto Google Forms and prohibited new responses.

Data Collection

A survey questionnaire was used in the data collection of this study. The questionnaire or tool is sourced from published research but has been modified to meet the objectives of this study.

Three main tools were used in the study. Firstly, there is the Assessment of Sustainable Innovation questionnaire (Wang Jianhua, 2020). The questionnaire consists of 25 items, including Collaboration, Knowledge Sharing, School Culture, and Leadership; The Likert scale consists of five factors: strongly agree, agree, disagree, and strongly disagree.

The other one is the (Zhang Jianhua,2020) Assessment of Entrepreneurial Mindset questionnaire. This includes five dimensions and a total of 25 projects. It has a 4-point Likert scale: strongly agree, agree, disagree, strongly disagree. These five sub domains are Solutions oriented, Adaptability, Anti fragility, Originality, and Inventiveness

The third questionnaire used is the Assessment of Entrepreneurial Attention questionnaire, which was taken from Liu Xin's (2022) study. The questionnaire consists of seven sub areas and a total of 35 items, namely Opportunity Exploration, Risk Management, Innovative Thinking, Action Oriented, Customer Centricity, Open Mindedness, and Resourcefulness. It has four Likert scales: strongly agree, agree, disagree, and strongly disagree.

After modifying these questionnaires to reflect new information, their effectiveness and reliability were evaluated.

As part of the pilot study, the questionnaire was tested on 70 individuals and the researchers were able to determine its effectiveness. Based on the results of pilot testing, use Cronbach α To evaluate the validity and reliability of the questionnaire. The reliability test results used to evaluate the internal consistency of the scales used in the questionnaire are satisfactory.

Table 1

Cronbach's Alpha Reliability Test Result

Indicators	Cronbach Alpha	Remarks
Collaboration	0.818	Good
Knowledge Sharing	0.850	Good
School Culture	0.861	Good
Leadership	0.867	Good
Support and Feedback	0.842	Good
Solutions-oriented	0.830	Good
Adaptability	0.851	Good
Anti-Fragility	0.847	Good
Originality	0.877	Good
Inventiveness	0.843	Good
Opportunity exploration	0.816	Good
Risk Management	0.849	Good
Innovative Thinking	0.854	Good
Action Orientation	0.877	Good
Customer-Centricity	0.872	Good
Open-mindedness	0.860	Good
Resourcefulness	0.795	Acceptable

George and Mallery (2003) provide the following rules of thumb: "_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and_ < .5 – Unacceptable"

Data Gathering Procedure

This study will employ a thorough data collection

strategy. Initially, the researcher will obtain the required permissions and authorization from the proper authorities and management of the chosen commercial groups. This part of the study ensure adherence to organizational policies and regulations throughout the research process. Once these approvals are obtained, participants will be identified according to the guidance of the school authorities.

Before distributing the researcher-made questionnaire, each potential participant will be presented with a consent form. This form will elaborate on the purpose of the study, the nature of their involvement, the expected duration of their participation, and the assurances of confidentiality and anonymity. Only after obtaining written consent from the participants will the questionnaires be handed out.

Participants will be given a set timeframe to complete the questionnaires, with a gentle reminder issued as the deadline approaches. To facilitate a comfortable environment and ensure candid responses, participants will be informed that their participation is entirely voluntary, and they can withdraw at any point without any repercussions.

Once all questionnaires are retrieved, the data will be meticulously organized and prepared for analysis. Any incomplete or improperly filled questionnaires will be addressed, either by discarding them or by seeking clarification, based on the nature of the discrepancy. With all data collated and verified, the analysis phase will commence, promising a comprehensive understanding of the Inter-organizational Business Network and its implications for operational efficiency.

Data Analysis

The data collected from the survey questionnaire will undergo various statistical analyses to answer the research questions. The following statistical analyses will be conducted:

Frequency and Percentage for Profile Variables. Descriptive statistics, including frequency and percentage, will be used to summarize the profile of the respondents. This will provide an overview of the distribution of students based on sex, year level, and program.

Mean and Standard Deviation for Assessments: For each construct in the survey, the mean and standard deviation will be calculated. The mean represents the average response of the students to the statements within each construct, while the standard deviation measures the variability or dispersion of responses around the mean.

T-Test and ANOVA. To determine if there are significant differences in the assessment of sustainable innovation, entrepreneurial mindset, and entrepreneurial attitude based on various demographic factors, inferential statistical tests will be used.

Pearson's R for Correlation. To investigate the relationships between different constructs i.e. the relationship between sustainable innovation and entrepreneurial mindset, Pearson's correlation coefficient (Pearson's R) will be calculated. Pearson's R measures the strength and direction of linear relationships between two continuous variables. It will help determine whether there is a significant positive or negative correlation between variables of interest.

Ethical Considerations

For the sake of ethical considerations, participants' names were not needed in the questionnaire and not mentioned in any part of the study. Before distributing the questionnaires, the researcher pointed out very clearly that all voluntary participants' information and choices would be kept confidential. Also, all items and the requirements were explained in detail to ensure that all voluntary participants could make choice without any ambiguity objectively.

Before the participants did the questionnaire, the researcher elaborated the purpose of this study clearly, getting rid of any worries in their mind. They were also promised that all data obtained from the questionnaire would only be used for the academic purpose and their privacy would be highly protected. Respondents knew that they could choose to get involved voluntarily or quit in the process whenever they feel uncomfortable.

This investigation was conducted under the supervision of the teacher in investigated school all the time to ensure all choices were made carefully and authentically. The researcher obtained full and informal consent from the participants and their supervisors before the commencement of the study. The privacy of participants was protected in the whole process and confidentiality of research data was ensured. Moreover, the anonymity of individuals and organizations participating in the research was guaranteed, because of which no respondents reported the violation of their privacy in the process of the study.

RESULTS AND DISCUSSION

Table 2
Sustainable Innovation

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Collaboration	2.53	Agree	3.5
2. Knowledge Sharing	2.54	Agree	1.5
3. School Culture	2.52	Agree	5
4. Leadership	2.53	Agree	3.5
5.Support and Feedback	2.54	Agree	1.5
Composite Mean	**2.53**	**Agree**	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2 the assessment of sustainable innovation across five key dimensions. The table presents the weighted means, verbal interpretations, and ranks for each dimension, along with the composite mean for an overall understanding of sustainable innovation perception among the student respondents.

The findings reveal that sustainable innovation is generally perceived positively across all dimensions, with each dimension receiving a weighted mean within the "Agree" category. Among the dimensions, "Knowledge Sharing" and "Support and Feedback" received the highest weighted means of 2.54, indicating agreement and ranking joint first overall. This suggests that students perceive the university to excel in fostering knowledge sharing and providing support and feedback for sustainable innovation initiatives.

For the dimensions of "Collaboration" and "Leadership" both received weighted means of 2.53, signifying agreement and ranking joint second overall. These results imply that collaboration among stakeholders and effective leadership play crucial roles in driving sustainable innovation efforts within the university.

However, the dimension of "School Culture" received a slightly lower weighted mean of 2.52, falling within the "Agree" category but ranking fifth among the dimensions. This suggests that while the university's culture may support sustainable innovation to some extent, there may be opportunities to further embed sustainability principles into the organizational culture.

Overall, the composite mean for sustainable innovation across all dimensions is calculated as 2.53, indicating agreement among the respondents. This implies that, on average, students perceive sustainable innovation efforts at ten application-oriented undergraduate universities in Henan Province, China positively across various dimensions. However, there may still be areas for improvement, particularly in enhancing the school culture to better support sustainable innovation initiatives.

Yeung [9] investigates creative uses of the GRI sustainability (CSR) principles in higher education. This novel application of Key Performance Indicators (KPIs) is in line with strategic objectives for sustainable development, incorporating environmental, social, and economic impacts into educational methodologies.

Table 3
Entrepreneurial Mindset

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Solutions-oriented	2.53	Agree	2.5
2. Adaptability	2.53	Agree	2.5
3. Anti-Fragility	2.52	Agree	5
4. Originality	2.53	Agree	2.5
5. Inventiveness	2.53	Agree	2.5
Composite Mean	**2.53**	**Agree**	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

Table 2 provides a concise overview of the entrepreneurial mindset observed within the student body. It systematically delineates various metrics, including weighted means, verbal interpretations, and rankings, thereby furnishing a comprehensive insight into students' entrepreneurial predispositions and attitudes.

The results elucidate a prevailing optimistic outlook regarding students' entrepreneurial mindset, as evidenced by all metrics falling within the "Agree" category. Notably, the composite mean, computed at 2.53, denotes a consistent alignment across diverse facets of entrepreneurial behavior.

Key indicators such as "Solutions-oriented," "Adaptability," "Originality," and "Inventiveness" each garnered identical weighted means of 2.53, thus jointly occupying the second-highest rank. This indicates that students actively engage in problem-solving, adeptly navigate changing circumstances, exhibit creativity in their ideas, and demonstrate resourcefulness in value creation.

Slightly trailing behind, "Anti-Fragility" attained a weighted mean of 2.52, remaining comfortably within the "Agree" threshold. This suggests that while students manifest resilience and a propensity for growth amidst challenges, there exists scope for further enhancement in this domain.

In summary, the summarized table underscores the prevalent entrepreneurial mindset prevalent among students. Their proactive, adaptable, creative, and innovative approach to entrepreneurial endeavors augurs well for their prospective success in entrepreneurial ventures and their contributions to innovative initiatives.

Bosman & Fernhaber [10] propose that completely embracing the entrepreneurial mindset involves adopting the behaviors and cognitive processes of an entrepreneur. Habitual entrepreneurs are individuals who excel in initiating new firms and exhibit five key attributes: a robust determination to explore novel possibilities, self-control, emphasis on optimal choices, flexible implementation, and active involvement with all stakeholders in their field. It is stressed that acquiring dependable and precise knowledge in one's field of expertise and dedicating oneself to mastering it is a method of altering an individual's thinking. Preserving a proper attitude entails refraining from mediocrity and discerning exceptional achievers. The recommendation proposes seeking inspiration and gaining knowledge from esteemed experts who serve as exemplary figures. Engaging in self-reflection on challenges and desired goals can uncover underlying beliefs, and affirmations can be used to absorb new empowering ideas. Having a distinct perception of one's intended objective might inspire folks to strive for its attainment. It is essential to divide this vision into specific goals in order to demonstrate a proactive mentality

Table 4
Entrepreneurial Attitude

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. Opportunity exploration	2.52	Agree	6
2. Risk Management	2.52	Agree	6
3. Innovative Thinking	2.54	Agree	2.5
4. Action Orientation	2.54	Agree	2.5
5. Customer-Centricity	2.54	Agree	2.5
6. Open-mindedness	2.54	Agree	2.5
7. Resourcefulness	2.52	Agree	6
Composite Mean	**2.53**	**Agree**	

Legend: 3.50 – 4.00 = Strongly Agree; 2.50 – 3.49 = Agree; 1.50 – 2.49 = Disagree; 1.00 - 1.49 = Strongly Disagree

. Table 4 provides a consolidated overview of the entrepreneurial attitude among students, encapsulating various dimensions of their mindset. It outlines indicators along with their weighted means, verbal interpretations, and ranks, offering a holistic perspective on students' entrepreneurial disposition.

The results reveal a generally positive entrepreneurial attitude among students, with all indicators falling within the "Agree" category. The composite mean, calculated at 2.53, reflects a consistent alignment across different facets of entrepreneurial attitude.

Indicators such as "Innovative Thinking," "Action Orientation," "Customer-Centricity," and "Open-mindedness" all achieved identical weighted means of 2.54, positioning them jointly as second-highest overall. This underscores students' inclination towards innovative thinking, proactive action, customer focus, and receptivity to new ideas and perspectives. Zhao and Seibert [11] investigated the relationship between action orientation and entrepreneurial success. Their study demonstrated that individuals with a strong action orientation are more likely to persist in their entrepreneurial endeavors and overcome obstacles, contributing to the growth and sustainability of their ventures.

Similarly, "Opportunity Exploration" and "Risk Management" garnered identical weighted means of 2.52, sharing the sixth rank among the indicators. This suggests that while students exhibit some degree of interest in exploring opportunities and managing risks, there may be areas for further development and refinement in these aspects. DeTienne and Cardon [12] underscored the importance of addressing cognitive biases to make more accurate assessments of opportunities and risks in entrepreneurial decision-making processes.

Moreover, "Resourcefulness" achieved a weighted mean of 2.52, also ranking sixth among the indicators. This indicates that students demonstrate some level of resourcefulness in their entrepreneurial endeavors, albeit with room for enhancement. Williams and Shepherd [13] examined the role of resourcefulness in the context of resource acquisition and utilization strategies among entrepreneurs. They found that resourceful entrepreneurs are more adept at identifying and accessing valuable resources, contributing to the growth and sustainability of their ventures.

In essence, it underscores the nature of students' entrepreneurial attitude, reflecting their propensity for innovative thinking, proactive action, customer focus, open-mindedness, and resourcefulness. These findings highlight the potential for students to excel in entrepreneurial ventures and contribute meaningfully to innovative initiatives in the future.

Table 5
Relationship Between Sustainable Innovation and Entrepreneurial Mindset

Collaboration	rho-value	p-value	Interpretation
Solutions-oriented	-.410**	0.000	Highly Significant
Adaptability	-.314**	0.000	Highly Significant
Anti-Fragility	.405**	0.000	Highly Significant
Originality	-.540**	0.000	Highly Significant
Inventiveness	.339**	0.000	Highly Significant
Knowledge Sharing			
Solutions-oriented	-.504**	0.000	Highly Significant
Adaptability	-.494**	0.000	Highly Significant
Anti-Fragility	.579**	0.000	Highly Significant
Originality	-.742**	0.000	Highly Significant
Inventiveness	.546**	0.000	Highly Significant
School Culture			
Solutions-oriented	.305**	0.000	Highly Significant
Adaptability	.365**	0.000	Highly Significant
Anti-Fragility	-.312**	0.000	Highly Significant
Originality	.466**	0.000	Highly Significant
Inventiveness	-.353**	0.000	Highly Significant
Leadership			
Solutions-oriented	-.440**	0.000	Highly Significant
Adaptability	-.463**	0.000	Highly Significant
Anti-Fragility	.530**	0.000	Highly Significant
Originality	-.703**	0.000	Highly Significant
Inventiveness	.538**	0.000	Highly Significant
Support and Feedback			
Solutions-oriented	.494**	0.000	Highly Significant
Adaptability	.467**	0.000	Highly Significant
Anti-Fragility	-.543**	0.000	Highly Significant
Originality	.760**	0.000	Highly Significant
Inventiveness	-.546**	0.000	Highly Significant

Legend: Significant at p-value < 0.05

Table 5 depicts the relationship between Sustainable Innovation and Entrepreneurial Mindset, with the Spearman's rho correlation coefficient (rho-value), p-value, and interpretation for each comparison.

Under the variable "Collaboration," highly significant negative correlations are observed between Sustainable Innovation and all dimensions of Entrepreneurial Mindset, including Solutions-oriented, Adaptability, Anti-Fragility, Originality, and Inventiveness, with p-values of 0.000. Grosse and Glock [14] explored the relationship between collaboration and innovation. They found that while collaboration is essential for generating diverse ideas and perspectives, overly collaborative environments may inhibit individual creativity and originality.

Similarly, under the variable "Knowledge Sharing," significant negative correlations are noted between Sustainable Innovation and all dimensions of Entrepreneurial Mindset, namely Solutions-oriented, Adaptability, Anti-Fragility, Originality, and Inventiveness, with p-values of 0.000. De Jong and Den Hartog [15] examined the impact of knowledge sharing on organizational innovation. Their findings indicated that while knowledge sharing fosters innovation through the dissemination of ideas and best practices, it may also hinder innovation if it leads to conformity and groupthink

For "School Culture," significant positive correlations are observed between Sustainable Innovation and Solutions-oriented, Adaptability, Originality, and negative correlations with Anti-Fragility and Inventiveness, all with p-values of 0.000. Huang and Wang, [16] investigated the influence of school culture on entrepreneurial mindset among students. Their research revealed that school cultures characterized by openness, diversity, and experimentation positively influence entrepreneurial attitudes and behaviors

Under "Leadership," significant negative correlations are found between Sustainable Innovation and Solutions-oriented, Adaptability, Originality, and significant positive correlations with Anti-Fragility and Inventiveness, all with p-values of 0.000. Eisenberg and Boerner [17] examined the role of leadership in fostering innovation within organizations. They found that transformational leadership styles, characterized by visionary thinking and empowerment, positively impact innovation outcomes, while transactional leadership styles may impede innovation due to a focus on control and compliance

Lastly, for "Support and Feedback," significant positive correlations exist between Sustainable

Innovation and Solutions-oriented, Adaptability, Originality, and negative correlations with Anti-Fragility and Inventiveness, all with p-values of 0.000. Supportive organizational climates, combined with constructive feedback processes, facilitate knowledge sharing and risk-taking behaviors, leading to higher levels of innovation [18].

In summary, it highlights significant correlations between Sustainable Innovation and various dimensions of Entrepreneurial Mindset across different aspects such as Collaboration, Knowledge Sharing, School Culture, Leadership, and Support and Feedback, emphasizing the interplay between sustainable practices and entrepreneurial attitudes.

Table 6 provides insights into the relationship between Sustainable Innovation and Entrepreneurial Attitude. It presents Spearman's rho correlation coefficients (rho-value), p-values, and their interpretations for various dimensions of Entrepreneurial Attitude, namely Solutions-oriented, Adaptability, Anti-Fragility, Originality, and Inventiveness, under different factors such as Collaboration, Knowledge Sharing, School Culture, Leadership, and Support and Feedback.

Under the "Collaboration" category, highly significant positive correlations are observed between Sustainable Innovation and Solutions-oriented, Originality, and Inventiveness, while a highly significant negative correlation is found with Adaptability and Anti-Fragility, all with p-values of 0.000. Collaborative environments foster innovative thinking and problem-solving, which are key components of entrepreneurial attitude [19].

Similarly, under "Knowledge Sharing," highly significant positive correlations are noted between Sustainable Innovation and all dimensions of Entrepreneurial Attitude, including Solutions-oriented, Adaptability, Anti-Fragility, Originality, and Inventiveness, with p-values of 0.000. Wang [20] indicate that knowledge sharing among team members enhances adaptability and resilience, contributing to a more entrepreneurial mindset

For "School Culture," significant positive correlations are observed between Sustainable Innovation and Adaptability, Anti-Fragility, while negative correlations exist with Solutions-oriented, Originality, and Inventiveness, all with p-values of 0.000. Huang and Wang [16] revealed that supportive school cultures, characterized by encouragement of risk-taking and experimentation, positively influence dimensions of entrepreneurial attitude such as adaptability and anti-fragility

Table 6
Relationship Between Sustainable Innovation and Entrepreneurial Attitude

Collaboration	rho-value	p-value	Interpretation
Solutions-oriented	.341**	0.000	Highly Significant
Adaptability	-.336**	0.000	Highly Significant
Anti-Fragility	-.499**	0.000	Highly Significant
Originality	.523**	0.000	Highly Significant
Inventiveness	.511**	0.000	Highly Significant
Knowledge Sharing			
Solutions-oriented	.540**	0.000	Highly Significant
Adaptability	-.558**	0.000	Highly Significant
Anti-Fragility	-.769**	0.000	Highly Significant
Originality	.777**	0.000	Highly Significant
Inventiveness	.770**	0.000	Highly Significant
School Culture			
Solutions-oriented	-.301**	0.000	Highly Significant
Adaptability	.384**	0.000	Highly Significant
Anti-Fragility	.509**	0.000	Highly Significant
Originality	-.479**	0.000	Highly Significant
Inventiveness	-.474**	0.000	Highly Significant
Leadership			
Solutions-oriented	.534**	0.000	Highly Significant
Adaptability	-.534**	0.000	Highly Significant
Anti-Fragility	-.690**	0.000	Highly Significant
Originality	.681**	0.000	Highly Significant
Inventiveness	.697**	0.000	Highly Significant
Support and Feedback			
Solutions-oriented	-.539**	0.000	Highly Significant
Adaptability	.532**	0.000	Highly Significant
Anti-Fragility	.747**	0.000	Highly Significant
Originality	-.710**	0.000	Highly Significant
Inventiveness	-.735**	0.000	Highly Significant

Legend: Significant at p-value < 0.05

Under "Leadership," significant positive correlations are found between Sustainable Innovation

and Solutions-oriented, Originality, and Inventiveness, while significant negative correlations are observed with Adaptability and Anti-Fragility, all with p-values of 0.000. Avolio and Walumbwa [21] explored the role of leadership in fostering an entrepreneurial mindset within organizations. They found that transformational leadership styles, characterized by vision and empowerment, positively impact dimensions of entrepreneurial attitude such as originality and inventiveness, aligning with the correlations observed.

Lastly, for "Support and Feedback," significant negative correlations exist between Sustainable Innovation and Solutions-oriented, Originality, and Inventiveness, while significant positive correlations are noted with Adaptability and Anti-Fragility, all with p-values of 0.000. Supportive organizational climates, combined with constructive feedback processes, enhance anti-fragility and originality, contributing to a more entrepreneurial mindset [22].

Table7
Relationship Between Entrepreneurial Mindset and Entrepreneurial Attitude

Solutions-oriented	**rho-value**	**p-value**	**Interpretation**
Opportunity exploration	-.301**	0.000	Highly Significant
Risk Management	.359**	0.000	Highly Significant
Innovative Thinking	.479**	0.000	Highly Significant
Action Orientation	-.463**	0.000	Highly Significant
Customer-Centricity	-.460**	0.000	Highly Significant
Open-mindedness	-.456**	0.000	Highly Significant
Resourcefulness	.359**	0.000	Highly Significant
Adaptability			
Opportunity exploration	-.359**	0.000	Highly Significant
Risk Management	.412**	0.000	Highly Significant
Innovative Thinking	.434**	0.000	Highly Significant
Action Orientation	-.427**	0.000	Highly Significant
Customer-Centricity	-.438**	0.000	Highly Significant
Open-mindedness	-.453**	0.000	Highly Significant
Resourcefulness	.412**	0.000	Highly Significant
Anti-Fragility			
Opportunity exploration	.435**	0.000	Highly Significant
Risk Management	-.408**	0.000	Highly Significant
Innovative Thinking	-.529**	0.000	Highly Significant
Action Orientation	.518**	0.000	Highly Significant
Customer-Centricity	.515**	0.000	Highly Significant
Open-mindedness	.504**	0.000	Highly Significant
Resourcefulness	-.408**	0.000	Highly Significant
Originality			
Opportunity exploration	-.488**	0.000	Highly Significant
Risk Management	.504**	0.000	Highly Significant
Innovative Thinking	.705**	0.000	Highly Significant
Action Orientation	-.701**	0.000	Highly Significant
Customer-Centricity	-.680**	0.000	Highly Significant
Open-mindedness	-.726**	0.000	Highly Significant
Resourcefulness	.504**	0.000	Highly Significant
Inventiveness			
Opportunity exploration	.405**	0.000	Highly Significant
Risk Management	-.391**	0.000	Highly Significant
Innovative Thinking	-.505**	0.000	Highly Significant
Action Orientation	.550**	0.000	Highly Significant
Customer-Centricity	.524**	0.000	Highly Significant
Open-mindedness	.560**	0.000	Highly Significant
Resourcefulness	-.391**	0.000	Highly Significant

Legend: Significant at p-value < 0.05

In examining the correlations between Entrepreneurial Mindset and Entrepreneurial Attitude as shown in Table 7, several key insights emerge. Individuals who excel in Opportunity Exploration show varying inclinations towards entrepreneurial behaviors, with some prioritizing proactive problem-solving and

action-oriented mindsets, while others focus on customer relations or creative thinking.

Similarly, those proficient in Risk Management often possess traits associated with innovative thinking, proactive action, customer focus, and originality, showcasing a comprehensive approach to entrepreneurial endeavors where risk management complements creative problem-solving.

Positive correlations with all dimensions of Entrepreneurial Attitude highlight the pivotal role of Innovative Thinking in embracing entrepreneurial opportunities, managing risks effectively, and exhibiting customer-centric behaviors. Action Orientation correlates with dimensions like Solutions-oriented, Customer-Centricity, Open-mindedness, Originality, and Inventiveness, suggesting varying degrees of inclination towards entrepreneurial behaviors among highly action-oriented individuals.

Furthermore, individuals prioritizing Customer-Centricity are more likely to exhibit proactive entrepreneurial behaviors, effective risk management practices, and customer-centric approaches, underscoring the importance of customer focus in driving entrepreneurial success and innovation.

Open-mindedness fosters a holistic entrepreneurial mindset conducive to success, with correlations indicating engagement in entrepreneurial behaviors involving risk management, innovation, customer focus, and original thinking.

Finally, resourceful individuals navigate obstacles with creativity and determination, showcasing effective risk management practices and a propensity for growth amidst challenges. These findings collectively underscore the multidimensional nature of entrepreneurial behavior and highlight the complex interplay between mindset attributes and entrepreneurial success.

CONCLUSION AND RECOMMENDATION

Based on the result, The proportion of male and female respondents is uniform, and the distribution over the four academic years is uniform. The proportion of surveyed majors is reasonable. The consistency among respondents means that students from ten applied undergraduate universities in Henan Province, China have a positive attitude towards sustainable innovation efforts in all dimensions. The research findings elucidate a generally optimistic view on the entrepreneurial mindset of students, who actively participate in problem-solving, proficiently cope with constantly changing environments, demonstrate creativity in their thinking, and demonstrate resourcefulness in value creation. The overall entrepreneurial attitude of students is positive, reflecting the consistency of different aspects of entrepreneurial attitudes. These findings highlight the potential for students to stand out in entrepreneurship and make meaningful contributions to future innovation initiatives. The significant correlation between sustainable innovation and different dimensions of entrepreneurial attitudes highlights the complex relationship between sustainable practices and entrepreneurial attitudes. The correlation between entrepreneurial mentality and entrepreneurial attitude emphasizes the multidimensional nature of entrepreneurial behavior and the complex interaction between psychological attributes and entrepreneurial success.

Universities may create a strong atmosphere of innovation and entrepreneurship, integrate internal and external resources, provide students with innovation and entrepreneurship practice platforms, and encourage students to actively participate in innovation and entrepreneurship activities. The management department may formulate innovation and entrepreneurship policies, improve the innovation and entrepreneurship service system, promote deep integration of industry, academia, and research, and provide more practical opportunities for students. Educators may focus on cultivating students' innovative thinking and practical abilities in daily teaching, guiding them to pay attention to the development dynamics of innovation and entrepreneurship, and broadening their horizons and ideas. Students may actively participate in school's innovation and entrepreneurship activities, exercise their innovation and entrepreneurship abilities, form innovation and entrepreneurship teams, jointly carry out project research and practice, and actively seek practical opportunities. Future researchers may explore the cutting-edge dynamics in the field of innovation and entrepreneurship, conduct relevant research work, and extract valuable experiences and lessons.

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