SCIENTIFIC CULTURE
www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 4, (2026), pp. 8803-8813
Open Access. Online & Print

DOI: 10.5281/zenodo.12426870

VALIDATING BUSINESS CREATION INSTRUMENTS FOR CHINESE UNIVERSITY STUDENTS: A CONTENT VALIDITY INDEX (CVI) APPROACH

Yanli Wang[1], Sheerad Sahid[2]*, Hadi Sumarsomo[3]*

[1] Faculty of Education, Universiti Kebangsaan Malaysia
[2] Faculty of Education, Universiti Kebangsaan Malaysia
[3] kultas Ekonomi dan Perniagaan,Universitas Negeri Malang

Received: 19/07/2025
Accepted: 16/01/2026

Corresponding Author: Sheerad Sahid

ABSTRACT

This study developed and validated a content-valid scale to measure Business Creation among Chinese university students. Applying a rigorous two-stage process, we first constructed an initial 28-item pool across four dimensions: Creativity & Innovation, Proactiveness & Initiative, Risk-Taking, and Entrepreneurial Behaviors. Seven interdisciplinary experts evaluated item relevance using the content-validity index (CVI) methodology. Four items with sub-threshold I-CVI scores (<0.83) were removed, resulting in a 24-item pool with excellent scale-level content validity (S-CVI/Ave = 0.90-1.00 per dimension). In the second, theory-driven stage, to achieve a purer behavioral construct, we refined the scale by removing all items measuring psychological predispositions, retaining only those assessing observable, reportable entrepreneurial actions. The final 11-item University Student Business Creation Scale demonstrates robust content validity, with an S-CVI/Ave of 0.95. By integrating Western measurement theory with the Chinese educational context through expert validation, this study provides a concise, contextually relevant tool for assessing Business Creation and establishes a solid foundation for subsequent psychometric validation and cross-cultural research.

KEYWORDS: Content Validation; Content Validity Index; Business Creation; Chinese university Students; Measuring Instruments.

1. INTRODUCTION

In the Contemporary Chinese economic landscape, business creation has been enshrined as a pivotal national strategy for driving innovation, alleviating employment pressures, and fostering sustainable economic growth. This is perhaps best encapsulated in the nationwide "Mass Entrepreneurship and Innovation" initiative, championed by the Chinese government since 2014, which has created a powerful ecosystem supporting new venture creation (State Council, 2017). Within this ecosystem, Chinese university students represent a critical demographic. They are perceived not only as a source of high-quality human capital but also as potent agents of technological innovation and disruptive business models (Mamun et al., 2017).

To catalyze this potential, a comprehensive support system has been established. Chinese universities have been mandated to integrate entrepreneurship education into their curricula, offering courses, workshops, and seminars. Beyond the classroom, a vast infrastructure of university-based incubators, science parks, and annual business plan competitions provides students with practical resources, mentor-ship, and seed funding (The State Council General Office, 2021). The policy environment further incentivizes student start-ups through tax breaks, simplified registration procedures, and preferential loan schemes. Consequently, the number of college graduates choosing the path of business creation has seen a significant uptick, transforming from a peripheral alternative to a mainstream career choice (Huang et al., 2022; Cotter, 2024).

However, beneath this façade of vigorous development, a fundamental academic and practical challenge has become increasingly apparent: how to accurately, effectively, and contextually measure the key outcome variable of business creation among Chinese university students. Although numerous measurement tools have been developed within the field of entrepreneurship research, such as the Entrepreneurial Intention Scale or the Entrepreneurial Self-Efficacy Scale, most focus on measuring antecedent variables or psychological traits such as intention, attitude, or perceived efficacy (McGee et al., 2009; Shirokova et al., 2016). Business creation itself, as a multidimensional behavioural construct, and its concrete, observable manifestations are often not directly or sufficiently captured by existing tools, particularly within the unique context of Chinese university students.

This measurement gap stems from a dual disconnect. First, a cultural-contextual disconnect. Predominant instruments are rooted in Western, individualistic paradigms, emphasizing personal ambition, risk-taking, and independence. In contrast, the entrepreneurial decisions and activities of Chinese students are embedded within a collectivist cultural fabric, potentially shaped by complex factors such as familial expectations, social networks ("guanxi"), fear of losing face, and responses to national development agendas (Su et al., 2023; Duong et al., 2022). Existing scales often fail to incorporate these localized drivers or inhibitors of business creation. Second, an economic-technological disconnect. The unique structure of China's digital economy, especially the asset-light, opportunity-driven venture models revolving around super-platforms (e.g., WeChat, Alipay), has shaped the behavioral characteristics of a new generation of student entrepreneurs (Huang et al., 2025). Traditional scale items may not reflect these novel, specific preparatory and enactment behaviors.

Therefore, developing a measurement tool that accurately captures the essence of business creation among Chinese students—one that is both culturally adapted and sensitive to contemporary realities—is a pressing need for advancing research and enhancing the efficacy of policy and educational interventions. This instrument must be theoretically sound yet pragmatically relevant, capturing the multifaceted nature of business creation, as it is understood within this unique demographic and cultural setting. The development process must be methodologically robust, ensuring the instrument is both reliable and valid. The first and most critical step in this process is establishing content validity—the degree to which an instrument has an appropriate sample of items for the construct being measured (Polit & Beck, 2006). Without strong content validity, any subsequent statistical validation (e.g., construct validity, reliability) is built on a flawed foundation. An instrument cannot accurately measure "entrepreneurial readiness" if its items are not relevant, representative, and clear to the target population and experts in the field.

Content validity is a critical early step in the instrument validation process, ensuring that scale items are representative, relevant, and clearly aligned with the intended construct (Haynes et al., 1995; Boateng et al., 2018). Unlike other forms of validity that rely on empirical testing, content validity depends primarily on expert judgment and systematic analysis of the measurement domain. In this context, the Content Validity Index (CVI) has been widely adopted as a transparent and replicable method for evaluating expert agreement on item

relevance (Zamanzadeh et al., 2015). Despite its recognized importance, few studies have applied CVI methodology to validate business creation instruments tailored to Chinese university students—a significant gap given that this method provides a systematic, quantitative approach to evaluating and maximizing content validity (Polit et al., 2007). Moving beyond simple face validation, the CVI method leverages judgments from a curated panel of experts who rate each item's relevance to the target construct. By calculating both item-level (I-CVI) and scale-level (S-CVI) indices, researchers can make evidence-based decisions to retain, revise, or discard items, refining the instrument to a high standard before field deployment. This approach is particularly crucial for the present study, as it allows for the formal incorporation of expert insight into culturally and contextually appropriate indicators of business creation potential within the unique Chinese academic environment.

This study aims to develop and preliminarily validate a multidimensional scale designed specifically to measure business creation among Chinese university students, employing a systematic and rigorous Content Validity Index (CVI) approach. The objectives are to: (1) generate an initial item pool grounded in literature and contextual analysis across key dimensions such as entrepreneurial cognition, behavioral preparation, opportunity exploration, and resource acquisition; (2) convene an interdisciplinary panel of experts to quantitatively evaluate the relevance and cultural appropriateness of each item using CVI metrics; (3) refine the items based on both item-level and scale-level CVIs, incorporating qualitative expert feedback; and (4) produce an initial scale with strong content validity. This work will establish a solid foundation for subsequent large-sample empirical testing (e.g., construct validity, reliability), ultimately providing a reliable, localized measurement tool for both academic research and practical entrepreneurship education.

2. LITERATURE REVIEW

2.1 Business Creation Among University Students

Business creation, also referred to as new venture creation, has become a central focus in entrepreneurship education, particularly within the context of higher education. It encompasses a range of activities related to initiating and developing a business venture, including opportunity recognition, resource mobilization, team building, and market entry (McGee et al., 2009; Shirokova et al., 2016). Among Chinese university students, business creation has gained increasing attention due to the government's strong policy support under the "Mass Entrepreneurship and Innovation" initiative. In this environment, universities are actively promoting business creation through competitions, incubators, and curriculum development. However, despite the proliferation of such activities, the evaluation tools used to measure business creation often lack context-specific validation.

2.2 Measuring Business Creation: Constructs and Instruments

Several existing instruments attempt to measure entrepreneurial activities or behaviors, but few directly address business creation as a distinct construct. For example, Shirokova et al. (2016) proposed a unidimensional business creation scale emphasizing initiative-taking and action orientation. Escrig-Tena et al. (2022) further refined business creation into sub-dimensions such as entrepreneurial activities, proactive behavior, and resilience in the face of failure. These scales are widely used in international research but may not fully capture the nuances of business creation within China's unique educational and sociocultural context.

Furthermore, in the Chinese context, scholars have noted that business creation among students is often influenced by environmental factors such as entrepreneurial climate, policy incentives, and institutional support (Mei & Symaco, 2020; Huang et al., 2023). Therefore, measuring business creation among Chinese university students requires not only linguistic translation of existing instruments but also contextual adaptation to ensure cultural relevance and conceptual alignment. Without rigorous content validation, adapted scales may risk construct-irrelevant variance or fail to capture key dimensions of student-led entrepreneurial efforts.

2.3 Content Validity and the Content Validity Index (CVI)

Content validity is defined as the degree to which an instrument adequately represents the construct it intends to measure (Polit & Beck, 2006). It is a critical step in ensuring the relevance, clarity, and representativeness of questionnaire items, particularly when instruments are adapted across different populations or settings. Unlike other forms of validity that rely on empirical testing, content validity is judged by expert consensus. In quantitative content validation, the Content Validity Index (CVI) is widely recognized for its rigor and transparency. The CVI includes two components: I-CVI (Item-Level CVI), which assesses the proportion of experts rating an item as relevant, and S-CVI (Scale-Level CVI), which evaluates the overall

validity of the instrument, either through average agreement (S-CVI/Ave) or universal agreement (S-CVI/UA) (Lynn, 1986; Davis, 1992).

Recent studies have demonstrated the practical application of CVI in various domains. For instance, Munisamy et al. (2021) applied the CVI method to validate a financial literacy scale for B40 households in Malaysia, using a 7-point relevance scale rated by five experts. Their results indicated that most items achieved I-CVI values above the recommended threshold of 0.83. Similarly, Wang and Sahid (2024) validated an entrepreneurial behavior instrument among Chinese vocational college students using a 4-point relevance scale with five domain experts. Items scoring below an I-CVI of 1.00 were either revised or removed, ensuring high scale-level content validity (S-CVI/Ave ≥ 0.90).

These precedents reinforce the CVI's value in quantitatively evaluating content validity, especially for adapted or newly developed instruments. The CVI method is particularly useful when expert panel sizes range between 5 to 10, and researchers aim to establish transparent criteria for retaining, revising, or discarding items (Polit et al., 2007). Importantly, the content validation process should also be documented systematically, including the selection of expert panels, item review procedures, and decision rules for CVI thresholds.

2.4 Gaps in the Literature and Study Contribution

While internationally developed scales for measuring business creation provide valuable frameworks, their applicability to Chinese university students' business creation activities remains limited due to inadequate content validation within this specific context. Existing instruments often prioritize generalized entrepreneurial intentions or psychological traits—such as risk propensity or creativity—over concrete, observable venture creation behaviors. Moreover, within China's unique higher education ecosystem, characterized by strong policy support and institutional incubators, there is a distinct lack of consensus regarding which constructs most accurately reflect student-led entrepreneurial development. Many scales overlook critical operational activities essential in early-stage venturing, such as business registration, intellectual property application, market validation, and securing funding—actions that signify the transition from intention to implementation. This gap underscores the necessity of developing a culturally adapted and rigorously content-validated instrument capable of capturing the full spectrum of entrepreneurial actions among Chinese university students, from ideal to enterprise establishment.

This study seeks to address this gap by conducting a rigorous content validation of a business creation instrument adapted for Chinese university students. Drawing on best practices from Polit and Beck (2006), Lynn (1986), and the procedures used in Munisamy et al. (2021) and Wang & Sahid (2024), this study applies the CVI method with a panel of seven domain experts to evaluate item relevance and scale validity. The results aim to offer an empirically grounded tool for assessing student business creation and lay the foundation for subsequent psychometric validation.

3. METHODOLOGY

Content validity reflects the extent to which an instrument's items adequately represent the construct under investigation and is considered a foundational aspect of measurement quality (Haynes et al., 1995; Zamanzadeh et al., 2015). In the early stage of instrument development, researchers are expected to conduct a detailed construct analysis, clarify conceptual dimensions, and ensure item alignment with theoretical definitions (Boateng et al., 2018). In this study, Business Creation refers to the process-oriented behaviors and preparatory actions that students undertake to explore, develop, and advance a new venture idea toward realization. To ensure the content validity of the measurement tool, a six-step procedure was followed, adapted from Yusoff (2019):

（1）Drafting the content validation form；
（2）Recruiting a panel of domain experts；
（3）Conducting independent expert evaluations；
（4）Reviewing items and construct domains；
（5）Assigning relevance scores and dichotomizing responses；
（6）Calculating content validity indices；

3.1 Developing the Content Validation Form

To ensure consistency and informed judgment, each expert was provided with a comprehensive validation form that outlined the study's objectives, key construct definitions, and intended measurement framework. Prior research emphasizes that expert reviewers must have a solid understanding of the theoretical foundation and practical application of the instrument to provide meaningful evaluations (Haynes et al., 1995; Boateng et al., 2018). Without this contextual understanding, item ratings may lack coherence or misrepresent the construct domains. Therefore, a structured content validation form was developed, incorporating a 4-point relevance scale ranging from "not relevant" to

"highly relevant" (Zamanzadeh et al., 2015). This form guided experts in evaluating each item's clarity, representativeness, and alignment with the defined conceptual dimensions. As shown in Figure 1.

Assessment Guide of Content Validation

We cordially invite you as an expert to evaluate the content validity of the Students' Business Creation Determinants Inventory, a instrument designed to assess key factors influencing business creation using a 7-point Likert scale (1 = "Strongly Disagree" to 7 = "Strongly Agree"). We kindly request your objective assessment of item representative, clarity of phrasing, theoretical coherence, and potential redundancies. Constructive suggestions for refining ambiguous wording, reclassifying items, or removing irrelevant content are highly appreciated. For questions or additional details, feel free to contact us directly. Thank you for contributing to the advancement of this research tool. Please use the following rating to indicate the extent to which each item applies with this study.

Degree of relevance:

1 = The item is not relevant to the measured domain.
2 = The item is somewhat relevant to the measured domain.
3 = The item is quite relevant to the measured domain.
4 = The item is highly relevant to the measured domain.

Figure 1 Content Validation Evaluation

The initial instrument was developed to assess business creation activities among Chinese university students. The measurement items were developed based on the three-dimensional theoretical framework of Entrepreneurial Orientation (EO) by Miller (1983), which includes innovativeness, risk-taking, and proactiveness. These items were adapted from established instruments by Escrig-Tena et al. (2022), Shirokova et al. (2016), and Bolton & Lane (2012), and the scale was adapted to fit the sociocultural and educational context of Chinese higher education. Each item was revised for clarity, cultural relevance, and alignment with the intended construct definitions. A total of 28 items were retained in the initial version of the instrument.

Table 1: Form of the content validation for the measured structures.

Code	Tested Items	Expert's Consent Level				Expert's Comments
BC1	I often seek out new and creative ways to solve problems or complete tasks.	1	2	3	4	
BC2	I often come up with ideas that others have not thought of.	1	2	3	4	
BC3	I enjoy tasks that require me to think creatively.	1	2	3	4	
BC4	I often generate original solutions to problems.	1	2	3	4	
BC5	I often help implement new ideas into practice in entrepreneurship-related projects or competitions.	1	2	3	4	
BC6	I take the initiative to start tasks or projects.	1	2	3	4	
BC7	I often plan ahead to avoid problems before they happen.	1	2	3	4	
BC8	I am quick to act when I identify a good opportunity.	1	2	3	4	
BC9	I often take initiative immediately even when others don't.	1	2	3	4	
BC10	I often jump at opportunities to reach my goals.	1	2	3	4	
BC11	I often motivate key team members to support innovative ideas during entrepreneurial activities.	1	2	3	4	
BC12	I often actively tackle problems.	1	2	3	4	
BC13	I often take the chance to get actively involved in entrepreneurial events or competitions.	1	2	3	4	
BC14	I enjoy taking calculated risks to achieve goals.	1	2	3	4	
BC15	I take bold action even when the outcome is uncertain.	1	2	3	4	
BC16	If I believe in an idea, I am not afraid to fail.	1	2	3	4	
BC17	I often take risks in entrepreneurship-related activities or decisions.	1	2	3	4	
BC18	I often go for high returns even when it involves major risks.	1	2	3	4	
BC19	I have discussed business ideas with potential customers during an entrepreneurial project.	1	2	3	4	
BC20	I have collected information about markets or competitors for entrepreneurial purposes.	1	2	3	4	
BC21	I have written a business plan as part of my entrepreneurial training or course.	1	2	3	4	
BC22	I have participated in developing or marketing products/services through university entrepreneurial programs.	1	2	3	4	
BC23	I have prepared materials or equipment for an entrepreneurial project.	1	2	3	4	
BC24	I have tried to obtain financial support (e.g., competitions, incubators) for my entrepreneurial activities.	1	2	3	4	
BC25	I have applied for a patent, copyright, or trademark for my entrepreneurial project.	1	2	3	4	
BC26	I have successfully applied for a patent, copyright, or trademark for my business idea.	1	2	3	4	
BC27	I have registered or attempted to register a business.	1	2	3	4	
BC28	I have tried to sell products or services to real customers.	1	2	3	4	

3.2 Recruiting a panel of domain experts

In order to assess the content validity of the tool, an expert panel of seven domain experts was purposely selected on the basis of their conceptual expertise and practical relevance. In accordance with the recommended practices for content validation (Lynn, 1986; Zamanzadeh et al., 2015), the composition of the expert panel comprised a diverse group of professionals, incorporating entrepreneurship education and practical entrepreneurial experience. Two of the seven experts were selected on the basis of their practical experience in business creation and mentoring students in business creation. The other five experts were all from different universities, including one from an international university. Primarily, candidates were expected to have obtained a PhD in a relevant discipline, such as entrepreneurship, education, or business. Additionally, they were required to demonstrate at least a certain degree of academic or entrepreneurial experience. Finally, they were expected to have a certain degree of familiarity with the tool's development or evaluation process. The invitations were formally dispatched via email and WeChat. Each expert was provided with a comprehensive validation pack, which included an overview of the research purpose, a definition of the concept, a description of the project, and a standardised 4-point relevance rating scale. The assessment team was tasked with evaluating the relevance and clarity of each entry in relation to the construct definition, utilising a standardised 4-point relevance scale (Davis, 1992). The validation process was characterised by both academic rigour and practical insight, ensured by a diverse panel. The detailed information of the evaluation experts is shown in Table 2.

Table 2 Correlation between experts' expertise and measurement tools

NO.	Position or title	Organization	Areas of expertise
1	Professor	Sichuan Tourism University	Entrepreneurship Education
2	Associate Professor	Hubei Normal University	Entrepreneurship Education
3	Associate Professor	Hubei Polytechnic University	Entrepreneurship Education
4	Doctor of philosophy	Universitas Negeri Malang	Entrepreneurship Education
5	Doctor of philosophy	Nanchang University	Entrepreneurship Education
6	CEO	Huangshi Lantu Bio-Technology Co., Ltd.	Entrepreneurship Education
7	EP	Beijing Zhongnan Tianhua Education Technology Development Co., Ltd.	Entrepreneurship Education

3.3 Conducting independent expert evaluations

This study adopted a remote, asynchronous content validation strategy, enabling expert reviewers to independently assess the instrument without the constraints of in-person meetings. Expert panels were contacted via email and WeChat and received a formal invitation letter outlining the study purpose and their expected role. Upon confirmation of participation, each expert was provided with a complete evaluation package, including a cover letter, construct definitions, item descriptions, scoring instructions, and a standardized validation form. Prior literature suggests that non-face-to-face validation procedures, when supported by clear communication and follow-up mechanisms, can achieve high levels of response accuracy and efficiency (Hyrkäs et al., 2003; Zamanzadeh et al., 2015).

3.4 Reviewing items and construct domains

Before rating the relevance of each item, experts were asked to thoroughly evaluate the alignment between items and their respective construct domains. This step ensured that each item was not only conceptually accurate but also representative of the theoretical framework underpinning the instrument. As noted by DeVellis (2017), content validation requires more than surface-level agreement—it depends on how well items reflect the full breadth and depth of the construct being measured. Experts were encouraged to provide detailed feedback, either in written form or through brief comments, regarding item clarity, redundancy, or conceptual mismatch. Such qualitative input plays a crucial role in enhancing item relevance and refining domain boundaries (Haynes et al., 1995). To facilitate communication and reduce the risk of misunderstanding during the review process, the researcher included clear instructions, contact information, and follow-up support throughout the evaluation phase.

3.5 Assigning relevance scores and dichotomizing responses

A total of seven experts were engaged to provide independent assessments of the instrument's item relevance and clarity. Each expert received both a rating form and a comment form, allowing for both quantitative scoring and qualitative feedback. Experts were instructed to evaluate each item using a 4-point relevance scale, where 1 = not relevant and

4 = highly relevant. In line with established content validation procedures, responses were dichotomized for CVI computation: ratings of 3 or 4 were coded as "1" (indicating relevance), while ratings of 1 or 2 were coded as "0" (indicating non-relevance) (Polit & Beck, 2006; Zamanzadeh et al., 2015). This binary classification ensured standardization in I-CVI calculations across expert judgments. In addition to numerical scores, experts were encouraged to provide open-ended comments on each item's clarity, ambiguity, or contextual appropriateness. These qualitative insights were systematically reviewed and used to guide potential item revision prior to further scale validation. As suggested by Hyrkäs et al. (2003), combining quantitative ratings with expert commentary enhances both the depth and credibility of the content validation process.

3.6 Calculating content validity indices

To evaluate the content validity of the instrument, both the Item-Level Content Validity Index (I-CVI) and the Scale-Level Content Validity Index (S-CVI) were calculated. The I-CVI was computed for each item as the proportion of experts who rated it as relevant (i.e., a score of 3 or 4 on the four-point relevance scale) out of the total number of experts. Given the participation of seven experts in this study, according to the criteria recommended by Polit and Beck (2006), To ensure a high degree of consistency in the evidence, we adopted a stricter criterion than the conventional threshold (0.78): items with an I-CVI ≥ 0.86 were retained; those with an I-CVI ≤ 0.83 were directly excluded and did not enter the revision stage.For scale-level validation, the S-CVI was assessed using the average method (S-CVI/Ave), which represents the mean of all I-CVI values across the scale. In line with widely accepted methodological recommendations, an S-CVI/Ave value of ≥ 0.90 was adopted as indicative of excellent overall content validity (Polit & Beck, 2006). This approach ensures that the instrument demonstrates both item-level appropriateness and scale-level coherence, essential for the robustness of the measurement tool.

Table 3 Decision Table for Content Validity Assessment

Number of Agreeing Experts	I-CVI Value	Polit & Beck (2006) Criterion	Action Recommendation
7 out of 7	1.0	Excellent	Remain
6 out of 7	0.86	Excellent	Remain
5 out of 7	0.78	Revise	Delete
4 out of 7	≤ 0.57	Unacceptable	Delete

4. FINDINGS

4.1 Initial Content Validity Assessment Based on Expert Evaluation

This study used the content validity index to quantitatively analyze the Business Creation Scale. Seven experts evaluated the relevance of each item to the target construct. At the item level, we calculated the item-level content validity index (I-CVI), which is the proportion of experts who rated an item 3 or 4 out of the total number of experts. Based on the criteria established by Polit and Beck (2006), the critical value of the I-CVI was set at 0.83 (meaning that at least six experts agreed on the item's relevance) for a seven-person panel. Items that did not meet this threshold were revised or deleted. At the scale level, this study used the mean value method (S-CVI/Ave), which is calculated by averaging the I-CVIs of all items. The S-CVI/Ave is widely considered to be superior to the unanimous consensus method (S-CVI/UA) because it is less sensitive to individual expert disagreements and provides a more stable and representative assessment of overall validity (Polit & Beck, 2006).

This study initially constructed a theoretical item pool comprising 28 items, covering four dimensions: Creativity & Innovation, Proactiveness & Initiative, Risk-Taking, and Entrepreneurial Behaviour. Following expert evaluation, the initial item pool demonstrated sound content validity across all four predefined dimensions, as shown in Tables 4, 5, 6, and 7. Based on the I-CVI threshold, four items (BC9, BC11, BC18, BC26) were excluded for failing to meet the criteria. Following these deletions, the S-CVI/Ave values for each dimension ranged between 0.90 and 1.00, indicating that the revised 24-item pool possesses excellent content validity.

Table 4 The relevance rating on the scale for Creativity & Innovation

Item	Expert1	Expert2	Expert3	Expert4	Expert5	Expert6	Expert7	Expert in Agreement	I-CVI
BC1	1	1	1	1	1	1	1	7	1
BC2	1	1	1	1	1	1	1	7	1
BC3	1	1	1	1	1	1	1	7	1
BC4	1	1	1	1	1	1	1	7	1
								S-CVI/Ave	1

Table 5 The relevance rating on the scale for Proactiveness & Initiative

Item	Expert1	Expert2	Expert3	Expert4	Expert5	Expert6	Expert7	Expert in Agreement	I-CVI
BC5	1	0	1	1	1	1	1	6	0.86
BC6	1	1	1	1	1	1	1	7	1
BC7	1	1	1	1	1	1	1	7	1
BC8	1	1	1	1	1	1	1	7	1
BC9	1	0	1	1	1	0	1	5	0.71
BC10	1	1	1	1	1	1	1	7	1
BC11	1	0	1	1	1	0	1	5	0.71
BC12	1	1	1	1	1	1	1	7	1
BC13	1	0	1	1	1	1	1	6	0.86
								S-CVI/Ave	0.90

Table 6 The relevance rating on the scale for Risk-Taking

Item	Expert1	Expert2	Expert3	Expert4	Expert5	Expert6	Expert7	Expert in Agreement	I-CVI
BC14	1	1	1	1	1	1	1	7	1
BC15	1	1	1	1	1	1	1	7	1
BC16	1	1	1	1	1	0	1	5	0.86
BC17	1	1	1	1	1	1	1	7	1
BC18	1	0	1	1	1	0	1	5	0.71
								S-CVI/Ave	0.91

Table 7 The relevance rating on the scale for Entrepreneurial Behaviors

Item	Expert1	Expert2	Expert3	Expert4	Expert5	Expert6	Expert7	Expert in Agreement	I-CVI
BC19	1	1	1	1	1	1	1	7	1
BC20	1	1	1	1	1	1	1	7	1
BC21	1	1	1	1	0	1	1	6	0.86
BC22	1	1	1	1	1	1	1	7	1
BC23	1	1	0	1	1	1	1	6	0.86
BC24	1	1	1	1	1	1	1	7	1
BC25	1	1	1	1	1	1	1	7	1
BC26	1	1	0	1	1	1	0	5	0.71
BC27	1	1	1	1	1	1	1	7	1
BC28	1	1	1	1	1	1	1	7	1
								S-CVI/Ave	0.94

4.2 Item Refinement Based on Construct Purity

Although the preliminary CVI analysis supported a 24-item, four-dimensional model, further theoretical scrutiny revealed that this model conflated psychological dispositions (such as Creativity & Innovation, Proactiveness & Initiative and Risk-taking) with specific behaviours under the single concept of Entrepreneurial Behaviour. This risked blurring theoretical definitions and potentially compromising discriminant validity in subsequent statistical validation.

To ensure construct purity and measurement precision, this study decided to strictly confine the measurement focus to observable and reportable business readiness and creation actions. Based on this consideration, we removed all items primarily measuring psychological dispositions, namely all 15 items across the three dimensions of Creativity and Innovation, Proactiveness & Initiative, and Risk-Taking. This decision was theoretically grounded, aiming to ensure the scale more purely reflects entrepreneurial behaviour itself rather than its antecedent traits.

Ultimately, all 9 items meeting the I-CVI standard under the original 'Business Creation' dimension were retained. Additionally, 2 highly relevant specific behavioural items (BC5, BC13) were supplemented from the 'Proactiveness & Initiative' dimension to ensure behavioural completeness. All 11 items received high expert endorsement (I-CVI ≥ 0.86, with 9 items at 1.00), collectively forming the final version of the university Student Business Creation Scale.

4.3 Content Validity of the Final Scale

The final 11-item scale yielded I-CVI values ranging from 0.86 to 1.00 for all items, all significantly exceeding the critical threshold of 0.83 (See Tables 8). The overall S-CVI/Ave value for the scale was 0.95, substantially exceeding the excellent benchmark of 0.90 (Polit & Beck, 2006). This provides robust evidence that the streamlined scale adequately, accurately, and without redundancy represents the core dimensions of business creation among Chinese university students, demonstrating exceptionally robust content validity.

Table 8 Content Validity Indices for the Final Version of the University Student Business Creation Scale

Item	Expert1	Expert2	Expert3	Expert4	Expert5	Expert6	Expert7	Expert in Agreement	I-CVI
BC5	1	0	1	1	1	1	1	6	0.86
BC13	1	0	1	1	1	1	1	6	0.86
BC19	1	1	1	1	1	1	1	7	1.00
BC20	1	1	1	1	1	1	1	7	1.00
BC21	1	1	1	1	0	1	1	6	0.86
BC22	1	1	1	1	1	1	1	7	1.00
BC23	1	1	0	1	1	1	1	6	0.86
BC24	1	1	1	1	1	1	1	7	1.00
BC25	1	1	1	1	1	1	1	7	1.00
BC27	1	1	1	1	1	1	1	7	1.00
BC28	1	1	1	1	1	1	1	7	1.00
								S-CVI/Ave	0.95

5. DISCUSSION

5.1 Key Findings and Methodological Implications

This study developed an 11-item University Student Business Creation Scale with high content validity through a clear two-stage process: expert validity assessment followed by theory-driven refinement. Unlike many existing scales, this instrument explicitly distinguishes entrepreneurial psychological antecedents from concrete behaviors, strictly focusing measurement on the latter. This construct purity is a central methodological contribution, as it helps avert potential issues like factor conflation or multicollinearity in subsequent confirmatory factor analysis or structural equation modeling. It renders the scale particularly suitable for investigating various antecedents influencing business creation.

The findings confirm that CVI-based expert evaluation is a cornerstone for ensuring cultural and content relevance. The subsequent theory-driven refinement exemplifies the deepening process in scale development from "content adequacy" to "measurement precision." This hybrid strategy, combining quantitative metrics (CVI) with qualitative theoretical judgment, offers a replicable template for adapting and developing Western measurement tools within specific cultural contexts, such as that of Chinese university students.

5.2 Practical Applications

This scale provides educators and researchers in higher education with a concise and focused assessment tool. Educators can use it to objectively evaluate the effectiveness of entrepreneurship courses or programs in prompting students to take concrete actions, rather than merely altering their attitudes or intentions. Researchers can employ it as a reliable dependent variable to examine the actual impact of different educational interventions, support policies, or individual factors on business creation.

5.3 Limitations and Future Research Directions

The limitations of this study primarily stem from the inherently context-specific nature of the scale development process itself. The "University Student Business Creation Scale" was explicitly designed and validated for the context of Chinese higher education. While the interdisciplinary and international expert panel ensured the items' relevance and cultural appropriateness for this target context, the scale's direct applicability and measurement invariance in other cultural or national educational settings remain an open empirical question. Future research should test the scale's structural validity and cross-cultural equivalence in diverse populations to establish its broader generalizability.

Second, Content Validity is a necessary but insufficient condition for scale development. It establishes that the items are relevant and representative, but does not verify how they function together statistically. The construct validity, internal reliability, and criterion-related validity of this 11-item scale require rigorous empirical testing through large-sample surveys. Subsequent research must employ exploratory and confirmatory factor analysis to verify the hypothesized uni-dimensional or multidimensional structure, and examine the scale's relationship with other theoretically relevant variables (e.g., entrepreneurial intentions, actual venture creation).

Building on this foundation, future research should pursue several promising directions. First, large-scale administration of the scale across diverse regions and university types within China is needed to confirm its psychometric robustness and establish preliminary norms. Second, leveraging the purified behavioral focus of this scale, researchers can develop and validate complementary "pure" scales for distinct antecedent

constructs like "Entrepreneurial Mindset." This would enable the testing of more precise and theoretically clean structural models. Third, longitudinal designs are crucial to examine the scale's predictive validity for students' future entrepreneurial activities. Finally, the inclusion of practitioner experts in this study highlights the value of mixed-methods approaches; future work could conduct in-depth interviews to enrich the quantitative findings and explore nuanced behavioral dimensions.

6. CONCLUSION

In summary, this study systematically applied content validity index methodology and, through theory-driven construct refinement, developed an 11-item Business Creation Scale with high content validity for Chinese university students. Focusing on specific entrepreneurial preparation and establishment actions, the scale achieves clarity in construct definition and precision in measurement items, establishing a robust psychometric foundation for scientifically and effectively assessing business creation among university students within the Chinese context. Subsequent statistical validity verification will further refine this instrument, propelling entrepreneurship education and research towards more empirical and nuanced approaches.

Ethical considerations: This research was approved by the Research Ethics Committee of Universiti Kebangsaan Malaysia (Approval Ref: JEP-2025-516).

Conflict of Interest: The authors declare no conflicts of interest.

Funding: This research did not receive any financial support.

REFERENCES

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. Frontiers in Public Health, 6, 149. https://doi.org/10.3389/fpubh.2018.00149

Bolton, D. L., & Lane, M. D. (2012). Individual entrepreneurial orientation: Development of a measurement instrument. Education + Training, 54(2/3), 219–233. https://doi.org/10.1108/00400911211210314

Cotter, T. (2024). From caps and gowns to startups: The rising trend of new grads choosing entrepreneurship. Trish Cotter. https://trishcotter.com/2024/05/21/from-caps-and-gowns-to-startups-the-rising-trend-of-new-grads-choosing-entrepreneurship/

Davis, L. L. (1992). Instrument review: Getting the most from a panel of experts. Applied Nursing Research, 5(4), 194–197. https://doi.org/10.1016/S0897-1897(05)80008-4

DeVellis, R. F. (2017). Scale development: Theory and applications (4th ed.). Sage Publications.

Duong, C. D., Wach, K., Vu, N. X., Ha, S. T., & Nguyen, B. N. (2022). Entrepreneurial education, government policies and programmes, and entrepreneurial behaviours: A serial moderated mediation model. Entrepreneurial Business and Economics Review, 10(4), 37-54. https://doi.org/10.15678/EBER.2022.100403

Escrig-Tena AB, Segarra-Ciprés M, García-Juan B, Badoiu G-A. (2022). Examining the relationship between work conditions and entrepreneurial behavior of employees: does employee well-being matter? Journal of Management & Organization, 31(4):1996-2018. https://doi.org/10.1017/jmo.2022.9

Escrig-Tena, A. B., Segarra, M., García-Juan, B., & Badoiu, G. A.(2022). Examining the relationship between work conditions and entrepreneurial behavior of employees: Does employee well-being matter? Journal of Management & Organization, 7(3), 100214. https://doi.org/10.1016/j.jik.2022.100214

Escrig-Tena, A. B., Segarra-Ciprés, M., García-Juan, B., & Badoiu, G.-A. (2022). Examining the relationship between work conditions and entrepreneurial behavior of employees: Does employee well-being matter? Journal of Management & Organization, 1–23. https://doi.org/10.1017/jmo.2022.9

Haynes, S. N., Richard, D. C. S., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. Psychological Assessment, 7(3), 238–247. https://doi.org/10.1037/1040-3590.7.3.238

Huang M, Hua M, Li J, Han Y (2025), Digital economy empowered entrepreneurship. Management Decision, Vol. 63 No. 1 pp. 155–186. https://doi.org/10.1108/MD-09-2023-1650

Huang, L., Bai, X., Huang, L., Huang, Y., & Han, G. (2023). How Does College Students' Entrepreneurial Learning Influence Entrepreneurial Intention: Evidence from China. Sustainability, 15(12), 9301. https://doi.org/10.3390/su15129301

Huang, Y., An, L., Wang, J., Chen, Y., Wang, S., & Wang, P. (2021). The role of entrepreneurship policy in college students' entrepreneurial intention: The intermediary role of entrepreneurial practice and entrepreneurial spirit. Frontiers in Psychology, 12, 439. https://doi.org/10.3389/fpsyg.2021.585698

Hyrkäs, K., Appelqvist-Schmidlechner, K., & Oksa, L. (2003). Validity and reliability of a visual analogue scale for evaluating job satisfaction. Journal of Nursing Measurement, 11(1), 15–29. https://doi.org/10.1891/1061-3749.11.1.15

Lynn, M. R. (1986). Determination and quantification of content validity. Nursing Research, 35(6), 382–386. https://doi.org/10.1097/00006199-198611000-00017

Mamun, A. A., Nawi, N. B. C., Mohiuddin, M., Shamsudin, S. F. F. B., & Fazal, S. A. (2017). Entrepreneurial intention and startup preparation: A study among business students in Malaysia. Journal of Education for Business, 92(6), 296–314. https://doi.org/10.1080/08832323.2017.1365682

McGee, J. E., Peterson, M., Mueller, S. L., & Sequeira, J. M. (2009). Entrepreneurial Self-Efficacy: Refining the Measure. Entrepreneurship Theory and Practice, 33, 965-988. https://doi.org/10.1111/j.1540-6520.2009.00304.x

Mei, W., & Symaco, L. (2020). University-wide entrepreneurship education in China's higher education institutions: issues and challenges. Studies in Higher Education, 47(1), 177–193. https://doi.org/10.1080/03075079.2020.1735330

Miller, D. (1983). The correlates of entrepreneurship in three types of firms. Management Science, 29(7), 770–791. https://doi.org/10.1287/mnsc.29.7.770

Munisamy, A., Sahid, S., & Hussin, M. I. (2021). Content validation and content validity index calculation of B40 household's financial literacy. Turkish Online Journal of Qualitative Inquiry, 12(8):1057-1072. https://www.researchgate.net/publication/353731135

Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. Research in Nursing & Health, 29(5), 489–497. https://doi.org/10.1002/nur.20147

Shirokova, G., Osiyevskyy, O., & Bogatyreva, K. (2016). Exploring the intention–behavior link in student entrepreneurship: Moderating effects of individual and environmental characteristics. European Management Journal, 34(4), 386–399. https://doi.org/10.1016/j.emj.2015.12.007

State Council. (2017). Opinions of the State Council on strengthening the implementation of the innovation - driven development strategy and further promoting the in - depth development of mass entrepreneurship and innovation. Ministry of Science and Technology of the People's Republic of China. https://www.most.gov.cn/xxgk/xinxifenlei/fdzdgknr/fgzc/gfxwj/gfxwj2017/201707/t20170728_134303.html

Su, S., Costanzo, L.A., Lange, K., Ghobadian, A., Hitt, M.A. and Ireland, R.D. (2023), How Does Guanxi Shape Entrepreneurial Behaviour? The Case of Family Businesses in China. Br. J. Manag., 34: 1895-1919. https://doi.org/10.1111/1467-8551.12684

The State Council General Office. (2021). Guiding Opinions of the General Office of the State Council on Further Supporting College Students' Innovation and Entrepreneurship. Ministry of Education of the People's Republic of China. https://www.gov.cn/gongbao/content/2021/content_5647349.htm?eqid=833714c30002166a000000066459a2a6.

Wang F & Sahid, S.(2024). Content validation and content validity index calculation for entrepreneurial behavior instruments among vocational college students in China. Multidisciplinary Reviews, 7(9):2024187. https://doi.org/10.31893/multirev.2024187

Yusoff, M. S. B. (2019). ABC of content validation and content validity index calculation. Education in Medicine Journal, 11(2), 49–54. https://doi.org/10.21315/eimj2019.11.2.6

Zamanzadeh, V., Ghahramanian, A., Rassouli, M., Abbaszadeh, A., Alavi-Majd, H., & Nikanfar, A. R. (2015). Design and implementation content validity study: Development of an instrument for measuring patient-centered communication. Journal of Caring Sciences, 4(2), 165–178. https://doi.org/10.15171/jcs.2015.017