

Assessing Questionnaire Validity and Reliability on Learning Environment, School-Enterprise Cooperation, Motivation, and Employment Competitiveness

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ABSTRACT

Graduate employment outcomes are increasingly regarded as a primary indicator for assessing both the quality and the social value of higher education. With shifting labor market expectations, applied universities in China have placed greater priority on strengthening students' employability. This research investigates how the learning environment, collaboration between universities and enterprises, and student motivation collectively influence the employment competitiveness of undergraduates at Qingdao Hengxing University. A quantitative strategy rooted in a positivist paradigm was employed, and data were obtained through stratified random sampling with standardized questionnaires tailored to local academic and cultural contexts. A central focus of this study was the validation of the measurement tool. The process involved expert appraisal, exploratory factor analysis (EFA) and assessments of internal consistency using Cronbach's Alpha. Findings verified the robustness of the 97-item scale, providing strong support for both reliability and construct validity. By offering a validated and contextually relevant instrument, this study advances empirical research on the determinants of employability in applied universities. The results highlight the essential roles of supportive learning environments, university-enterprise partnerships, and student motivation in enhancing employment readiness. This validated framework can guide further investigations and inform practical interventions that align educational practices with labor market demands, thereby improving the competitiveness of graduates in China's evolving higher education sector.

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Contribution/Originality: This study provides a validated questionnaire that integrates learning environment, school-enterprise cooperation, motivation and

employment competitiveness, offering a reliable tool for research and practical improvements in graduate employability.

1. Introduction

Amid China's ongoing economic restructuring within the framework of the "new normal," the demand for application-oriented professionals with comprehensive capabilities, practical experience, and innovative potential has become increasingly prominent. In this context, the traditional dichotomy between research-oriented undergraduate education—which emphasizes theoretical and academic training—and vocational education—which focuses primarily on operational skills—has proven inadequate in addressing the complexities of contemporary labor market requirements. As an essential component of the higher education system, applied universities are distinctively positioned to fill this void by nurturing graduates who integrate practical proficiency with creative problem-solving abilities. The development of such talent not only serves national strategies for socio-economic advancement but also reflects the intrinsic developmental trajectory of higher education and reinforces the specialized educational mandate of applied institutions.

Recent research underscores the pivotal role of applied universities in cultivating industry-ready professionals through ability-centered education models (Zhang, 2025). The core mandate of applied higher education institutions is to foster students' capacity for critical thinking, knowledge mastery and practical application, the skills that are increasingly essential in addressing the demands of a rapidly evolving labor market (Okolie et al., 2019). This ability-driven approach reflects a strategic alignment with national economic development goals and emphasizes the integration of knowledge, cognitive development, technical competence, and personal attributes. Consequently, applied universities are tasked with restructuring curricula to promote interdisciplinary learning, optimize teaching plans, and construct a holistic framework for talent development. This pedagogical shift is aimed at producing versatile and high-quality graduates capable of adapting to the complex challenges of contemporary employment environments.

In recent years, the issue of graduate employment competitiveness has garnered increasing scholarly attention across a range of academic fields, including human resource management, educational leadership and policy, psychology, and sociology (Tomlinson, 2012). Driven by intensifying labor market pressures, universities have proactively incorporated employability development into their curricular and co-curricular practices, with the aim of fostering graduates equipped not only with disciplinary knowledge and technical skills but also with the personal attributes and behavioral competencies necessary for navigating the transition from higher education to professional employment. To support this agenda, academic inquiry has advanced both theoretical and empirical understandings of employability, focusing on its conceptualization (Donald et al., 2019), determinants (Monteiro et al., 2025), and structural models (Dacre Pool et al., 2014). These scholarly efforts provide an important foundation for enhancing the effectiveness of talent cultivation within the context of higher education reform and workforce development (Nghia et al., 2020).

1.1. Purpose of the Study

The purpose of this study is to develop and validate a comprehensive questionnaire designed to measure key factors influencing the employability of students in applied universities. Specifically, the study aims to assess the validity and reliability of the instrument across four critical constructs: learning environment, school-enterprise cooperation, student motivation and employment competitiveness. These constructs reflect the core dimensions shaping students' career readiness and are aligned with the strategic goals of applied higher education in fostering practice-oriented, industry-relevant talent.

1.2. Significance of Study

This study was conducted in Qingdao, China an emerging first-tier city recognized for its innovative educational reforms and the rapid expansion of its higher education sector. Despite notable progress in institutional development, empirical research on the employment competitiveness of university students in Qingdao remains relatively scarce, particularly within the context of private higher education institutions. To address this research gap, the present study aims to construct and validate a comprehensive measurement instrument that captures the antecedent factors influencing undergraduate students' competitiveness. By establishing the reliability and validity of the proposed scale, this study contributes to a rigorous diagnostic tool for use by educational policymakers, institutional leaders, and researchers. The validated instrument not only facilitates systematic assessment of employability-related constructs but also enhances the understanding of key drivers shaping graduate outcomes in applied university settings.

2. Literature Review

2.1. Research Framework

The formation of employment competitiveness is a complex process that requires an integrated theoretical perspective. In this study, human capital theory and total quality management theory were chosen as theoretical frameworks, aiming to comprehensively analyze the internal mechanisms of employment competitiveness from the perspectives of reciprocity and cognitive development.

In examining the employment outcomes of college graduates, core employment competitiveness can be understood as a multidimensional construct, reflected through several observable indicators such as professional competence, practical skills, job search capabilities, and the ability to access and mobilize employment-related resources (Wang et al., 2025). Among these, professional competence is often regarded as a latent or implicit capability, gradually cultivated through students' academic learning and extracurricular involvement throughout their university education. In contrast, practical skills, employment-seeking strategies, and resource utilization are typically seen as explicit competencies, developed primarily through structured career counseling and targeted employability training initiatives. These two categories—implicit and explicit competencies—are intrinsically linked and function in a complementary manner. While the accumulation of implicit capabilities underpins graduates' long-term career development, explicit skills play a critical role in facilitating their immediate entry into the workforce. A balanced enhancement of both dimensions is essential not only for

improving graduates' employment rates and career satisfaction but also for strengthening the institutional image and competitive advantage of higher education institutions in an increasingly dynamic labor market.

In the context of the present study, employment competitiveness is conceptualized as an individual's capacity to obtain, retain and re-enter employment, integrating multiple facets of employability such as knowledge acquisition, skill proficiency, and attitudinal readiness. According to [Kottmann and De Weert \(2013\)](#), while domain-specific expertise remains a fundamental requirement, employers increasingly prioritize graduates who exhibit a strong capacity for lifelong learning and possess a range of transferable skills, including teamwork, problem-solving, organizational planning, communication, and a sense of responsibility. Among these, interpersonal competence is often perceived as surpassing technical skills in importance. Additionally, attributes related to personal integrity—such as honesty, reliability, and ethical conduct—are frequently highlighted as essential selection criteria in recruitment processes ([Hinchliffe & Jolly, 2011](#)). To evaluate employment competitiveness in this study, a 24-item measurement instrument was adopted and refined based on [McQuaid and Lindsay's \(2013\)](#) employability framework, ensuring both theoretical coherence and contextual relevance.

Total Quality Management (TQM) has demonstrated significant influence on the enhancement of university students' employment competitiveness, particularly by embedding quality-driven practices throughout the academic ecosystem ([Lepeley, 2019](#)). Institutions that adopt TQM principles do not merely focus on internal efficiency or academic rigor, but extend their quality initiatives toward aligning education with labor market needs. This responsiveness to market dynamics allows students to acquire competencies that are directly applicable in professional contexts, such as technical proficiency, analytical skills, and innovation capacity ([Utkirov, 2024](#)).

Human Capital Theory serves as a foundational framework for understanding employment competitiveness, positing that education and training significantly enhance an individual's employability, thereby increasing their potential for improved labor market outcomes and income levels ([Kuzminov, 2019](#)). This theoretical lens emphasizes the complex and multidimensional character of employability. Within the scope of this research, students' employment competitiveness is viewed as a result of the dynamic interaction among three critical factors: a supportive and enriching learning environment, robust collaboration between universities and enterprises, and sustained student motivation. This conceptualization provides the analytical foundation for examining how these interrelated elements collectively shape graduates' competitiveness in an increasingly demanding employment landscape.

2.2. The Antecedents of Employment Competitiveness

[Closs et al. \(2022\)](#) conceptualize the learning environment as encompassing three interrelated dimensions: physical, pedagogical, and psychosocial. The physical dimension refers to the tangible and spatial attributes of the learning setting, including elements such as room layout, furniture design, and instructional equipment ([Lebasi & Talischi, 2024](#)). These physical characteristics can significantly influence the implementation of teaching strategies by either facilitating or limiting pedagogical flexibility. Peer relationships, as a key social factor, can foster a sense of belonging and support, which in turn encourage greater participation in academic tasks ([Yang et al., 2025](#); [Yang & Ompok, 2025](#)). Such positive interactions contribute to the acquisition of skills relevant to employability.

In the context of Chinese higher education, the learning environment plays a crucial role in shaping both students' academic achievement and their broader educational development. It encompasses a combination of physical, social, and cultural dimensions that interact to influence student engagement, motivation, and learning outcomes. Prior studies have shown that a supportive and stimulating learning environment enhances learners' intrinsic motivation, promotes collaboration, and fosters a sense of academic belonging are the factors that positively associated with improved academic performance (Kassab et al., 2024). Liang et al. (2025) describe a constructive learning environment as one that provides a supportive climate, encouraging creativity, collaboration, and critical thinking among students.

A well-structured educational setting, characterized by clear instructional goals, interactive pedagogy, and equitable peer and teacher support, has been found to encourage active participation and facilitate the co-construction of knowledge (Markauskaite et al., 2021). Such environments support deeper cognitive processing and the practical application of learned concepts. Conversely, learning spaces that are poorly designed or lack emotional and instructional support may demotivate students, hinder social integration, and constrain academic growth (Reinius et al., 2021). Therefore, effective learning environment design in Chinese universities must extend beyond physical infrastructure to intentionally cultivate meaningful student-teacher interactions and a culture of academic engagement.

A growing body of empirical research has examined the effectiveness of school-enterprise collaboration, particularly within the context of industry-academia integration. Findings indicate that the success of such partnerships is influenced by multiple interrelated factors, including stakeholder motivation, the quality of institutional relationships, communication mechanisms, organizational environment, collaborative behaviors, and structural models of cooperation (Chen et al., 2022). Drawing on these theoretical foundations, some scholars have developed comprehensive evaluation index systems centered on four primary dimensions: motivation, relationship, communication, and environment. These frameworks have been empirically tested and validated through statistical methods such as factor analysis. In the domain of vocational education, researchers have increasingly adopted mixed-methods designs to assess the practical impact of school-enterprise cooperation.

University-enterprise cooperation yields wide-ranging benefits that extend beyond student development to encompass higher education institutions, employers, and the broader industrial sector. Through the integration of practical industry experience into academic curricula and the cultivation of sustained linkages with external stakeholders, universities are better positioned to respond to evolving labor market needs and student aspirations (Tran, 2016). Such alignment not only facilitates adherence to policy directives emphasizing graduate employability but also contributes to enhancing the institutional image and competitiveness within an increasingly market-oriented higher education landscape. Moreover, initiatives aimed at improving employability frequently act as catalysts for deeper collaboration in domains such as applied research, technological innovation, and knowledge transfer (Arranz et al., 2022).

Motivation is widely recognized as a pivotal determinant of effective teaching and learning outcomes (Brophy, 2004). It constitutes a fundamental driving force in the learning process, as the acquisition of knowledge and skills typically depends on an individual's intrinsic desire or perceived need to engage with educational content (El

Miedany, 2018). Student motivation reflects the internal drive to achieve academic goals and can be observed through active participation in learning activities. Classroom engagement, encompassing cognitive, emotional, and behavioral dimensions, is a visible expression of this motivation (Yang & Ompok, 2025). Motivation is influenced by both intrinsic factors, such as personal interest and self-determination, and extrinsic elements, including recognition, rewards, and social support systems (Qinghua & Ompok, 2022). Empirical studies have further suggested that students' competitive tendencies are influenced by their motivational orientations as well as personality characteristics shaped through social interactions. Individuals exhibiting high levels of competitiveness often display a strong sense of responsibility, pronounced achievement motivation, and aspirations for financial success (Griffin, 2006). They also tend to value autonomy and demonstrate adaptability in response to shifting socio-economic conditions.

According to the achievement motivation model, individuals exhibiting high levels of this trait are typically more goal-oriented, resilient when confronted with difficulties, and actively engaged in the development of their own competencies (Magnano et al., 2016). This form of motivation enhances learners' perseverance, mitigates the fear of failure, and promotes adaptive behavior in dynamic or uncertain contexts. Consequently, individuals with strong achievement motivation are more likely to demonstrate higher levels of employability, particularly within highly competitive labor markets (Hogan et al., 2013).

Establishing the validity and reliability of the questionnaire used in this study is of critical importance for both academic research and institutional practice. In the context of applied universities, where education quality is increasingly linked to employment outcomes, the ability to accurately and consistently measure key influencing factors such as the learning environment, school-enterprise cooperation, and student motivation that essential for data-driven decision-making. Validity ensures that the instrument truly captures the constructs it is intended to measure, thereby enhancing the credibility of the research findings. Reliability, on the other hand, guarantees consistency across items and respondents, allowing for generalization across similar educational contexts.

3. Methodology

This study employed a quantitative research design rooted in the positivist paradigm, as its central aim was to empirically examine the relationships among the learning environment, school-enterprise cooperation, student motivation, and employment competitiveness. The adoption of a quantitative approach was justified in that it facilitates the application of standardized measurement instruments, enables rigorous statistical analyses, and supports the generalization of findings to the broader target population. Careful consideration was given to the number of items included, as an overly lengthy instrument may lead to reduced response rates, whereas an insufficient number of items may compromise content validity. To ensure alignment with the research objectives, the questionnaire was developed based on an established theoretical framework, thereby enhancing its reliability, construct coverage, and overall measurement precision.

According to Berk (1990), expert judgment plays a critical role in establishing content-related validity, particularly in ensuring that measurement instruments accurately represent the intended constructs. An initial item pool comprising 169 statements was developed to comprehensively capture the constructs under investigation. To ensure content validity, the instrument was reviewed by two subject-matter experts in the field of education. Based on their evaluations, which identified redundancy and the inclusion

of non-essential items, revisions were undertaken to enhance the clarity and relevance of the questionnaire. As a result, the instrument was streamlined to a total of 97 items. The finalized version included four subscales: the Learning Environment Scale, the School–Enterprise Cooperation Scale, the Student Motivation Scale, and the Employment Competitiveness Scale. Each subscale was purposefully constructed to align with the study’s central research objectives and to facilitate accurate measurement of the key variables. Responses are recorded on a five-point Likert scale, ranging from “strongly disagree” (scored 1), “do not agree” (scored 2), “Basic agree” (scored 3), “agree” (scored 4), to “strongly agree” (scored 5).

The Learning Environment Questionnaire employed in this study was adapted from the *What Is Happening In this Class?* (WIHIC) instrument originally developed by Fraser (2023), which is recognized as one of the most widely used tools for assessing classroom learning environments worldwide. The WIHIC is structured around seven dimensions—student cohesiveness, teacher support, involvement, investigation, task orientation, cooperation, and equity—that collectively capture critical aspects of students’ classroom experiences. Responses are measured on a five-point Likert scale, indicating the frequency of specific classroom occurrences. The version adopted for this study consists of 30 items distributed across the seven subscales, with items carefully selected to align with the study’s objectives. While the WIHIC has been extensively validated in international research, minor adaptations were made to ensure contextual relevance to the present research setting.

The School–Enterprise Cooperation Questionnaire employed in this study was adapted from earlier instruments developed by Xu (2011) in 2011 (Chunying, 2020). These instruments collectively provide a comprehensive framework for assessing school–enterprise engagement by capturing both organizational behaviors and psychological constructs relevant to partnership effectiveness. Building on these foundations, the adapted instrument in the present study is organized into four dimensions: institutional behavior of schools, enterprise behavior, students’ psychological capital, and students’ employability. In total, the questionnaire comprises 26 items across these four subscales. While the original scales offer robust coverage of school–enterprise cooperation, modifications were made to ensure contextual relevance to the current research setting.

Students’ motivation questionnaire comes from The Student Psychological Needs Scale (Goldman, Goodboy, & Weber, 2017; Gottfried, 1985), comprises five distinct dimensions encompassing a total of 17 items. It contains 5 dimensions: Autonomy, Competence, Relatedness with Classmates, Relatedness with Instructor, and Intrinsic Motivation.

The Employment Competitiveness Questionnaire utilized in this study was adapted from the empirical framework proposed by Zhang et al. (2022) in their study titled *An Empirical Study on the Improvement of College Students’ Employability Based on University Factors*. The instrument comprises 24 items rated on a 5-point Likert scale and is structured around eight specific sub-dimensions: professional knowledge and skills, learning ability, stress management (strain) ability, communication ability, practical skills, teamwork competence, information acquisition ability, and career planning capacity. This multidimensional structure enables a comprehensive assessment of students’ perceived competitiveness in the labor market.

3.2. Pilot Test

Prior to the commencement of the formal data collection process, a pilot study was conducted to examine the feasibility and suitability of the research design. As noted by [Chua \(2006\)](#), although a successful pilot test does not guarantee the overall success of the main study, it serves as a critical step in assessing the functionality of research instruments and the efficiency of data collection procedures. In a similar vein, [McMillan and Schumacher \(2010\)](#) emphasize the importance of utilizing previously validated measurement tools and recommend referencing empirical findings from related studies to further establish the reliability and consistency of the proposed measurement framework.

The target population for this pilot study comprised undergraduate students enrolled at Qingdao Hengxing University, an applied higher education institution located in Shandong Province, China. This cohort was intentionally chosen because the university places strong emphasis on applied learning and school–enterprise collaboration, thereby rendering its students an appropriate and representative group for examining constructs related to employability. The determination of the sample size followed the guidelines of [Krejcie and Morgan's \(1970\)](#) sample size determination table, which specifies recommended sample sizes for different population levels at a 95% confidence interval and a 5% margin of error. Institutional records indicated that the undergraduate population was approximately 2,500. According to the table, the minimum required sample size for this population was 152. To ensure robustness and to offset potential non-responses, 156 valid questionnaires were ultimately obtained. Accordingly, the final sample size satisfied the statistical requirements while also ensuring practical feasibility.

To assess the reliability and validity of the measurement instrument, a pilot study was conducted at Qingdao Hengxing University, China, between March 26 and April 8, 2025. A total of 156 undergraduate students from four classes participated in the pretest. The selection was purposive, aimed at ensuring alignment with the demographic and academic characteristics of the target population. To maintain the integrity and independence of the main dataset, participants involved in the pilot phase were excluded from the final sample used in the primary analysis.

Before distributing the questionnaire, the researchers provided participants with a clear explanation of the study's objectives and emphasized the principles of confidentiality and anonymity. These measures were intended to foster participant trust, promote honest responses, and enhance the overall quality of the collected data. The pilot version of the questionnaire comprised 97 items, developed to assess four primary constructs: the learning environment, school–enterprise cooperation, student motivation, and employment competitiveness.

Assessing the validity and reliability of instruments through statistical methods in pilot studies is an important step to ensure that appropriately developed instruments are used in actual studies.

According to [McMillan and Schumacher \(2010\)](#), validity constitutes a core criterion in determining the extent to which a measurement instrument appropriately supports the interpretations and conclusions derived from the data it produces. In the context of this study, ensuring the validity of the research instrument is critical, as it directly affects the accuracy, credibility, and interpretive strength of the research findings. Establishing

validity, therefore, represents a necessary prerequisite for drawing meaningful and trustworthy inferences.

Instrument validity can be established through multiple approaches, including assessments of content validity, face validity, and structural validity (Drost, 2011). A measurement tool is deemed valid when it accurately reflects the construct it is intended to measure (Creswell, 2009). In the present study, content validity was examined through expert review, wherein two scholars specializing in educational administration were invited to evaluate the relevance and clarity of each item. In addition, structural validity was assessed using SPSS, with statistical procedures applied to verify the underlying factor structure of the instrument. These combined validation strategies offer empirical support for the instrument's suitability in addressing the study's research objectives.

Expert judgment serves as a critical mechanism for verifying the accuracy, relevance, and comprehensiveness of an instrument's content. As Almasreh et al. (2019) asserts, items that are evaluated by experts as relevant, clear, and appropriate within their designated domains are more likely to exhibit strong content validity. Similarly, Shaheen et al. (2023) highlight that a systematic and rigorous expert review process contributes significantly to ensuring structural coherence and semantic clarity, thereby strengthening the overall validity of the measurement tool.

To ensure that the research instruments were closely aligned with the study's objectives, all four questionnaires underwent a formal expert review process followed by iterative revision. A content validity assessment was conducted with the participation of two senior university professors in Malaysia, both of whom possess expertise in curriculum and instructional design. During the initial evaluation, one expert raised concerns regarding the length of the instruments, noting that certain items appeared redundant or non-essential. In response to this feedback, the questionnaires were refined to enhance clarity and focus. The revised versions were subsequently resubmitted for a second round of evaluation. Both reviewers endorsed the updated instruments and confirmed their appropriateness for use in academic research contexts.

Exploratory Factor Analysis (EFA) is a fundamental statistical method employed to assess the construct validity of measurement instruments. Given that this study involved a refinement of the original scale through item reduction, it was necessary to re-establish construct validity for the revised version, as modifications to item composition may alter the underlying factor structure and loadings. Prior to performing EFA, it is essential to evaluate whether the dataset satisfies the assumptions required for factor analysis. This is commonly determined by examining the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity. A KMO value exceeding 0.60, combined with a statistically significant Bartlett's test result ($p < 0.05$), indicates that the correlations among items are sufficient to justify the application of factor analysis (Kaiser, 1974; Williams et al., 2010).

The extraction and retention of factors in Exploratory Factor Analysis (EFA) are guided by widely accepted statistical criteria. Specifically, each retained factor should possess an eigenvalue greater than 1.0, and individual item loadings should typically exceed 0.50 to ensure adequate representation of the underlying construct. Furthermore, items should load strongly on a single factor without exhibiting substantial cross-loadings on others. Additionally, the total variance explained by the retained factors should reach or exceed

50%, thereby indicating a satisfactory level of explanatory power for the instrument as a whole (Mustafa et al., 2024).

Reliability refers to the degree of consistency with which a measurement instrument yields stable and repeatable results when applied under similar conditions. It reflects the extent to which the tool produces dependable outcomes across repeated applications. Reliability can be broadly classified into internal and external dimensions. Internal reliability examines the coherence among items within a scale in measuring a single construct, whereas external reliability evaluates the stability of results over time through repeated administrations. Among the commonly employed methods for assessing reliability are the test-retest approach, split-half technique, and Cronbach's alpha coefficient, with the latter being the most frequently utilized in social science research. The Cronbach's alpha value ranges from 0 to 1, with higher values indicating stronger internal consistency. Conventionally, an alpha coefficient above 0.90 is considered excellent, between 0.80 and 0.90 as good, 0.70 to 0.80 as acceptable, and 0.60 to 0.70 as marginally acceptable (Izah et al., 2023). For most empirical research contexts, a threshold of 0.60 is generally regarded as the minimum acceptable level of reliability. To ensure the instrument's reliability and validity, the procedures recommended in previous quantitative studies were followed. Similar methodological approaches have been employed in educational research to evaluate instruments measuring psychological and organizational constructs (Ligin, Shin, & Ompok, 2025).

4. Study results

Researchers have conducted a process of evaluation of the study instruments from the aspects of validity and reliability to ensure that the instruments are appropriate and can be used in actual studies. Validity is used to measure the extent to which these study instruments actually evaluate the construct to be studied, while reliability refers to the degree of consistency and stability of the items in those instruments when used repeatedly in the same context.

4.1. Validity of Study Instruments

Both experts involved in the process of reviewing the instruments have stated the suitability of the built-in items in the context of this study. This agreement indicates that the study instrument has good face and content validity, i.e. the items formed are relevant and clear to the objectives of the study.

Before performing a factor analysis, researchers need to assess the perfection or adequacy of the item first. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test are commonly utilized to assess whether a dataset is appropriate for conducting factor analysis (Kaiser, 1974; Williams et al., 2010). The KMO index evaluates the adequacy of sampling by examining the proportion of common variance among variables, with values approaching 1 indicating greater suitability for factor extraction. In contrast, Bartlett's test of sphericity examines whether the variables are sufficiently correlated by testing if the correlation matrix significantly differs from an identity matrix. A p-value below 0.05 indicates significant inter-variable correlations, supporting the application of factor analysis (Bartlett, 1950; Williams et al., 2010).

4.1.1. Learning Environment Factor Analysis

Learning Environment contracts involve as many as 30 items to be analyzed. The results of the Bartlett tolerance test showed large and significant results. While the Kaiser-Meyer-Olkin sample adequacy measurement test value was 0.951, far from the recommended value of 0.60. Based on these findings, the data were considered suitable for factor analysis, and the test was continued. The load values for each item are shown in [Table 1](#).

Table 1: Learning Environment

No Item	Item	Load Factor
A1	I make friendships among students in this class.	.775
A2	I work well with other class members.	.806
A3	I help other class members who are having trouble with their work.	.764
A4	Students in this class like me.	.805
A5	In this class, I get help from other students.	.785
A6	The teacher takes a personal interest in me.	.776
A7	The teacher goes out of his/her way to help me.	.734
A8	The teacher considers my feelings.	.756
A9	The teacher is interested in my problems.	.782
A10	I give my opinions during class discussions.	.685
A11	The teacher asks me questions.	.682
A12	My suggestions are used during classroom discussions.	.664
A13	I ask the teacher questions.	.629
A14	Students discuss with me how to go about solving problems.	.652
A15	I carry out investigations to test my ideas.	.682
A16	I carry out investigations to answer questions coming from discussions.	.690
A17	I carry out investigations to answer questions that puzzle me.	.761
A18	Getting a certain amount of work done is important to me.	.751
A19	I know what I am trying to accomplish in this class.	.802
A20	I pay attention during this class.	.841
A21	I know how much work I have to do.	.857
A22	I cooperate with other students when doing assignment work.	.865
A23	I share my books or resources with other students when doing assignments.	.824
A24	When I work in groups in this class, there is teamwork.	.833
A25	I cooperate with other students on class activities.	.757
A26	Students work with me to achieve class goals.	.773
A27	The teacher gives as much attention to my questions as to other students' questions.	.842
A28	I get the same amount of help from the teacher as do other students.	.843
A29	I am treated the same as other students in this class.	.782
A30	My work receives as much praise as other students' work.	.817

Based on [Table 1](#), all designated items of the original instrument exhibit factor loadings ranging from 0.652 to 0.865, indicating a strong association with their respective factors. The results of the factor analysis show that the number of items for the learning environment construct remains at 30, consistent with the original instrument. Overall, the analysis confirms that all items demonstrate good structural properties and acceptable validity.

4.1.2. School-Enterprise Cooperation Factor Analysis

A total of 26 items related to the School–Enterprise Cooperation construct were subjected to analysis. The results of Bartlett’s test of sphericity were significant, and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy yielded a value of 0.935, well above the commonly recommended minimum of 0.60. These findings indicate that the data were appropriate for conducting factor analysis, and the subsequent procedures were carried out. The factor loadings of individual items are detailed in [Table 2](#).

Table 2: School-Enterprise Cooperation Analysis

No Item	Item	Load Factor
B1	Instructor teaching high school level.	.884
B2	School curriculum to adapt to business needs.	.907
B3	Training content in the school curriculum from the real business case.	.908
B4	School internships instructor skill level is very high.	.891
B5	The school where I study in help companies solve actual problems.	.934
B6	A business where I worked in participated in the construction of the school.	.921
B7	A business where I worked in provide employment opportunities for students.	.916
B8	Companies where training equipment for schools.	.925
B9	A business where I worked in provide students with educational programs.	.924
B10	Companies where I worked in arrange a special teacher mentoring our internship training.	.931
B11	A business where I was able to forgive our mistakes.	.904
B12	Companies where I have great confidence in us.	.911
B13	I have a strong team player, able to work effectively with a team.	.946
B14	Difficulties encountered setbacks I never give in easily.	.906
B15	To achieve the goal, I can always go unremitting efforts.	.881
B16	The face of difficulties, I will focus all their energy.	.870
B17	Insolving problems, I can always make full use of the resources I have.	.898
B18	Even in difficult times, I can maintain a festive mood.	.925
B19	No matter how bad things get, there is always redemption.	.833
B20	After attending school-enterprise cooperation, I understand more professional-technical knowledge.	.921
B21	After attending school-enterprise cooperation, mastering the skills learned professional requirements, applying it in work.	.944
B22	After attending school-enterprise cooperation, I am keen to seize employment opportunities.	.911
B23	After attending school-enterprise cooperation, I can accurately career planning.	.941
B24	After attending school-enterprise cooperation, I can effectively career development.	.940
B25	After attending school-enterprise cooperation, I can take the initiative to find new working methods to improve the quality of work.	.896
B26	After attending school-enterprise cooperation, I dare to meet challenges.	.921

According to [Table 2](#), all items within the original instrument for the school–enterprise cooperation construct demonstrated factor loadings ranging from 0.833 to 0.946. Following the factor analysis, the total number of items remained unchanged at 26, consistent with the original scale design. The analysis confirmed that all items exhibited satisfactory psychometric properties and met the criteria for acceptability.

4.1.3. Students' Motivation Factor Analysis

The students' motivation construct comprised 17 items subjected to factor analysis. Bartlett's test of sphericity produced high and statistically significant results, while the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy recorded a value of 0.900, substantially exceeding the minimum recommended threshold of 0.60. These results confirmed the suitability of the data for factor analysis, which was subsequently conducted. The factor loadings for all items are presented in [Table 3](#).

Table 3: Students' Motivation

No Item	Item	Load Factor
C1	In this class, I have the freedom to learn in my own way.	.892
C2	I have the freedom to complete course assignments in my own way.	.929
C3	I have the opportunity to decide for myself how I will learn in this class.	.917
C4	I have the freedom to succeed however I want to in this class.	.859
C5	I am competent in this class.	.879
C6	I can accomplish anything that is assigned to me in this class.	.849
C7	I do well in this class compared to other students.	.905
C8	I am close to several of my classmates.	.893
C9	I share several common interests with my fellow classmates.	.893
C10	I have a lot in common with several of my peers in this class.	.877
C11	I can relate to my instructor.	.975
C12	My instructor care about me as a student.	.970
C13	I feel closeness my instructor in this class.	.972
C14	Learning new concepts in this class is fulfilling to me.	.904
C15	Developing my understanding of the content is rewarding to me.	.876
C16	I get a sense of fulfillment when I learn new things in this class.	.875
C17	Learning new things in this class makes me feel like I am growing as a person.	.895

As shown in [Table 3](#), all items of the original instrument for the students' motivation construct exhibited factor loadings ranging from 0.849 to 0.975. The factor analysis retained all 17 items, consistent with the original scale. The findings confirm that each item demonstrated satisfactory measurement properties and met the criteria for acceptability.

4.1.4. Employment Competitiveness Factor Analysis

The employment competitiveness construct comprised 24 items subjected to factor analysis. Bartlett's test of sphericity produced high and statistically significant results, while the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy reached 0.950, well above the recommended minimum of 0.60. These findings indicate that the data were

appropriate for factor analysis, which was subsequently performed. The factor loadings for each item are presented in [Table 4](#).

Table 4: Employment Competitiveness

No Item	Item	Load Factor
D1	Communicate with others in English fluently.	.741
D2	My professional skills are firmly mastered.	.932
D3	I have obtained professional vocational qualifications.	.632
D4	In the conflict between study and entertainment, I will give priority to study.	.904
D5	I can learn without supervision.	.920
D6	I can study hard even if I do not like the course.	.906
D7	No matter how the external environment changes, I can adapt quickly.	.894
D8	I can handle emergencies with ease.	.922
D9	I am able to adjust my mindset in time.	.938
D10	No matter how the external environment changes, I can adapt quickly.	.900
D11	I can handle emergencies with ease.	.933
D12	I am able to adjust my mindset in time.	.911
D13	I can effectively use experience to solve problems	.920
D14	I can learn from experience in practice.	.943
D15	When encountering difficulties, I can combine my professional knowledge to deal with them.	.922
D16	I can solve tough problems as a team.	.930
D17	In order to ensure the smooth solution of the problems, I will seek suggestions of team members.	.948
D18	I will effectively cooperate with the team to complete the task.	.931
D19	Access to information through multiple channels.	.934
D20	Be able to accurately grasp the key to information.	.929
D21	Can filter out false information in the mass of information.	.933
D22	It is believed that good career planning ability can improve the success rate of job-hunting.	.929
D23	Have a clear plan for your future career development.	.903
D24	Have a career plan that promotes self-development.	.926

As shown in [Table 4](#), all items of the original instrument for the employment competitiveness construct demonstrated factor loadings ranging from 0.632 to 0.948. Following factor analysis, all 24 items were retained, consistent with the original scale design. The analysis confirmed that each item exhibited acceptable measurement properties and met the standards for construct validity.

4.2. Reliability of Study Instruments

The results demonstrate that all constructs exceeded the minimum threshold of 0.60, indicating that the instruments exhibit acceptable to excellent internal consistency ([Tavakol & Dennick, 2011](#)). [Table 5](#) presents the detailed reliability coefficients for each of the four measured variables used in this study.

In this study, a reliability analysis was performed on the Learning Environment Scale during the pilot phase. As shown in [Table 6](#), all 30 items demonstrate CITC values above 0.3, indicating that the items are coherent with the construct being measured. Moreover,

the removal of any single item does not result in a substantial increase in the scale's Cronbach's alpha, suggesting that each item contributes meaningfully to the scale's reliability.

Table 5: Reliability Test Results

Variable	Number of Items	Cronbach Alpha
Learning Environment	30	.990
School-Enterprise Cooperation	26	.992
Students' Motivation	17	.959
Employment Competitiveness	24	.989

Table 6: Results of Reliability Analysis of Learning Environment Scale

Dimension	Code	CITC	Cronbach α after item deletion
Student Cohesiveness	S1	0.738	0.950
	S2	0.921	0.917
	S3	0.873	0.926
	S4	0.835	0.933
	S5	0.874	0.926
Teacher Support	TS1	0.912	0.965
	TS2	0.926	0.961
	TS3	0.938	0.958
	TS4	0.928	0.961
Involvement	Im1	0.901	0.963
	Im2	0.915	0.961
	Im3	0.925	0.959
	Im4	0.910	0.962
	Im5	0.907	0.962
Investigation	Ig1	0.944	0.949
	Ig2	0.937	0.954
	Ig3	0.924	0.963
Task Orientation	T01	0.858	0.948
	T02	0.884	0.940
	T03	0.887	0.939
	T04	0.922	0.929
Cooperation	C1	0.905	0.964
	C2	0.943	0.958
	C3	0.922	0.961
	C4	0.914	0.962
	C5	0.882	0.968
Equity	E1	0.919	0.953
	E2	0.936	0.948
	E3	0.897	0.959
	E4	0.905	0.957

As presented in Table 7, all 26 items on the School-Enterprise Cooperation Scale demonstrate Corrected Item-Total Correlation (CITC) values above 0.3, indicating strong alignment with the underlying construct and the study's aims. Furthermore, the removal of any individual item does not result in a notable increase in the overall Cronbach's alpha coefficient, suggesting that each item consistently contributes to the internal reliability of

the scale. These results confirm that the School-Enterprise Cooperation Scale possesses excellent internal consistency and is suitable for further empirical analysis.

Table 7: Results of Reliability Analysis of School-Enterprise Cooperation Scale

Dimension	Code	CITC	Cronbach α after item deletion
Behavior in schools	S1	0.908	0.967
	S2	0.915	0.966
	S3	0.930	0.964
	S4	0.916	0.966
	S5	0.930	0.964
Behavior in enterprises	E1	0.908	0.979
	E2	0.911	0.979
	E3	0.940	0.977
	E4	0.940	0.977
	E5	0.948	0.976
	E6	0.928	0.977
	E7	0.913	0.978
Psychological Capital	P1	0.901	0.967
	P2	0.932	0.964
	P3	0.901	0.967
	P4	0.894	0.967
	P5	0.943	0.964
	P6	0.902	0.967
	P7	0.806	0.974
Employability of students	ES1	0.926	0.978
	ES2	0.945	0.977
	ES3	0.914	0.979
	ES4	0.952	0.977
	ES5	0.937	0.978
	ES6	0.912	0.979
	ES7	0.917	0.979

As shown in [Table 8](#), all 17 items on the Student Motivation Scale exhibit Corrected Item-Total Correlation (CITC) values exceeding 0.3, indicating that each item effectively reflects the intended construct and is appropriate for retention. Additionally, none of the item-deleted alpha values exceed the overall alpha, confirming that all items contribute positively to the internal consistency. These findings demonstrate that the Student Motivation Scale possesses strong reliability and is suitable for continued use in this study.

Table 8: Results of the Reliability Analysis of Students' Motivation

Dimension	Code	CITC	Cronbach α after item deletion
Autonomy	A1	0.908	0.938
	A2	0.930	0.932
	A3	0.896	0.942
	A4	0.840	0.959
Competence	C1	0.908	0.934
	C2	0.878	0.957
	C3	0.937	0.915
Relatedness with Classmates	RC1	0.940	0.915
	RC2	0.920	0.930

Relatedness with Instructor	RC3	0.871	0.966
	RI1	0.983	0.979
	RI2	0.966	0.991
	RI3	0.980	0.981
Intrinsic Motivation	I1	0.937	0.957
	I2	0.897	0.968
	I3	0.929	0.959
	I4	0.935	0.957

As shown in Table 9, all 24 items of the Employment Competitiveness Scale have Corrected Item-Total Correlation (CITC) values above 0.3, indicating that each item aligns with the intended measurement objectives and is suitable for retention. Moreover, no single item deletion leads to an increase in the overall alpha, suggesting that all items contribute meaningfully to the reliability of the instrument. Therefore, the scale demonstrates robust reliability and is appropriate for use in this study.

Table 9: Results of the Reliability Analysis of Employment Competitiveness

Dimension	Code	CITC	Cronbach α after item
Professional knowledge and skills	P1	0.829	0.721
	P2	0.703	0.865
	P3	0.748	0.810
Learning ability	L1	0.907	0.909
	L2	0.884	0.927
	L3	0.878	0.931
Strain ability	S1	0.911	0.934
	S2	0.895	0.945
	S3	0.918	0.929
Communication ability	C1	0.895	0.921
	C2	0.890	0.925
	C3	0.888	0.927
Practical ability	PA1	0.902	0.928
	PA2	0.939	0.902
	PA3	0.860	0.961
Teamwork ability	T1	0.905	0.939
	T2	0.906	0.938
	T3	0.915	0.932
Information acquisition ability	I1	0.904	0.935
	I2	0.904	0.935
	I3	0.908	0.933
Career planning ability	CP1	0.881	0.929
	CP2	0.871	0.939
	CP3	0.919	0.900

5. Conclusion

Grounded in Human Capital Theory and Total Quality Management Theory, this study conducted an empirical validation of a questionnaire designed to measure the antecedents of employment competitiveness within a regional university context in China. Through rigorous reliability assessments and exploratory factor analysis, the instrument was refined to include 97 items demonstrating strong psychometric properties. The finalized questionnaire serves as a scientifically robust and practically applicable tool for evaluating factors influencing employment competitiveness in Chinese Applied Colleges and Universities.. The results contribute to a deeper and more

systematic understanding of the determinants shaping graduate employment competitiveness, particularly within the context of China's private universities. It is of great significance to take a series of measures to enhance the employment competitiveness of college students. Explore new models of school-enterprise cooperation, provide with high-quality learning environments, stimulate learning motivation, cultivate knowledge, skills, and literacy urgently needed by society, and effectively enhance employment competitiveness. To build a strong educational nation and to provide policy recommendations for policymakers, offer practical teaching insights for educators, and advance the reform of higher education.

In summary, the scales used in this study exhibited good reliability and validity in measuring the employment competitiveness of students in Chinese Applied colleges and universities. These results not only validate the applicability of the scales but also offer valuable references for research in related fields. Future research can build on these scales to further explore the influencing factors and mechanisms of employment competitiveness in Chinese Applied colleges and universities.

Ethics Approval and Consent to Participate

The study was approved by the Research Ethics Committee of Universiti Malaysia Sabah. All procedures involving human participants were conducted in accordance with institutional ethical standards, and informed consent was obtained from all participants.

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Conflict of Interest

The authors declare no conflict of interest.

References

- Almanasreh, E., Moles, R., & Chen, T. F. (2019). Evaluation of methods used for estimating content validity. *Research in social and administrative pharmacy*, 15(2), 214-221.
- Arranz, N., Arroyabe, M. F., Sena, V., Arranz, C. F., & Fernandez de Arroyabe, J. C. (2022). University-enterprise cooperation for the employability of higher education graduates: a social capital approach. *Studies in Higher Education*, 47(5), 990-999.
- Bartlett, M. S. (1950). Tests of significance in factor analysis. *British Journal of Statistical Psychology*, 3(2), 77-85. <https://doi.org/10.1111/j.2044-8317.1950.tb00285.x>
- Berk, R. A. (1990). Importance of expert judgment in content-related validity evidence. *Western Journal of Nursing Research*, 12(5), 659-671. <https://doi.org/10.1177/019394599001200510>.
- Brophy, J. (2004). *Motivating students to learn*. Routledge.

- Chen, X., Chen, Y., Li, D., & Dong, H. (2022). Research on the influence mechanism of university-enterprise collaboration: Evidence From five southern coastal provinces in China. *Frontiers in Psychology*, 13, 929059.
- Chua, Y. P. (2006). *Asas statistik penyelidikan* [Fundamentals of research statistics]. McGraw-Hill Education.
- Chunying, M. (2020). Mediating role of psychological capital in relationships between school-enterprise cooperation and employment of students higher vocational education institutions. *Revista de Psicología del Deporte (Journal of Sport Psychology)*, 29(4), 135-148.
- Closs, L., Mahat, M., & Imms, W. (2022). Learning environments' influence on students' learning experience in an Australian Faculty of Business and Economics. *Learning Environments Research*, 25(1), 271–285. <https://doi.org/10.1007/s10984-021-09364-7>
- Creswell, J. W. (2009). *Research designs. Qualitative, quantitative, and mixed methods approaches*. Sage Publications.
- Dacre Pool, L., Qualter, P., & J. Sewell, P. (2014). Exploring the factor structure of the CareerEDGE employability development profile. *Education+ training*, 56(4), 303-313.
- Donald, W. E., Baruch, Y., & Ashleigh, M. (2019). The undergraduate self-perception of employability: Human capital, careers advice, and career ownership. *Studies in Higher Education*, 44(4), 599–614. <https://doi.org/10.1080/03075079.2017.1387107>
- Drost, E. A. (2011). Validity and reliability in social science research. *Education Research and Perspectives*, 38(1), 105–123.
- El Miedany, Y. (2018). Motivation in Education. In *Rheumatology Teaching: The Art and Science of Medical Education* (pp. 379-402). Cham: Springer International Publishing.
- Fraser, B. J. (2023). The evolution of the field of learning environments research. *Education Sciences*, 13(3), 257.
- Goldman, Z. W., Goodboy, A. K., & Weber, K. (2017). College students' psychological needs and intrinsic motivation to learn: An examination of self-determination theory. *Communication Quarterly*, 65(2), 167–191. <https://doi.org/10.1080/01463373.2016.1215338>
- Gottfried, A. E. (1985). Academic intrinsic motivation in elementary and junior high school students. *Journal of Educational Psychology*, 77(6), 631–645. <https://doi.org/10.1037/0022-0663.77.6.631>
- Griffin, K. (2006). Striving for success: A qualitative exploration of competing theories of high-achieving Black college students' academic motivation. *Journal of college student development*, 47(4), 384-400.
- Hinchliffe, G. W., & Jolly, A. (2011). Graduate identity and employability. *British Educational Research Journal*, 37(4), 563–584. <https://doi.org/10.1080/01411926.2010.482200>
- Hogan, R., Chamorro-Premuzic, T., & Kaiser, R. B. (2013). Employability and career success: Bridging the gap between theory and reality. *Industrial and organizational psychology*, 6(1), 3-16.
- Izah, S. C., Sylva, L., & Hait, M. (2023). Cronbach's alpha: A cornerstone in ensuring reliability and validity in environmental health assessment. *ES Energy & Environment*, 23, 1057.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31–36. <https://doi.org/10.1007/BF02291575>

- Kassab, S. E., Rathan, R., Taylor, D. C., & Hamdy, H. (2024). The impact of the educational environment on student engagement and academic performance in health professions education. *BMC medical education*, 24(1), 1278
- Kottmann, A., & de Weert, E. (2013). *Higher education and the labour market: International policy frameworks for regulating graduate employability*. Center for Higher Education Policy Studies (CHEPS).
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607–610. <https://doi.org/10.1177/001316447003000308>
- Kuzminov, Y., Sorokin, P., & Froumin, I. (2019). Generic and specific skills as components of human capital: new challenges for education theory and practice. *Фопсаўм*, 13(2 (eng)), 19-41.
- Lebasi, A., & Talischi, G. (2024). The Impact of Physical Learning Environments on Creativity in Educational Settings: A Systematic Review. *Int. J. Archit. Eng. Urban Plan*, 34(1).
- Lepeley, M. T. (2019). *EDUQUALITY: Human Centered Quality Management in Education. A Model for Deployment, Assessment and Sustainability*. IAP.
- Liang, M., Abdullah, M. K. & Cassy Ompok, C. (2025). Work Concerns and Teacher Effectiveness in China: The Moderating Role of Cultural Norms. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 10(3), p. e003277. doi: 10.47405/mjssh.v10i3.3277.
- Ligin, N. M., Shin, C., & Ompok, C. C. (2025). Kesahan dan Kebolehpercayaan Instrumen Sokongan Organisasi, Kepuasan Kerja, Ganjaran dan Komitmen Guru. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 10(6), e003451-e003451.
- Markauskaite, L., Ripley, D., Arthars, N., & Khosronejad, M. (2021). Co-designing for learning across disciplines: Design principles for student-led innovation. In *European Association for Research on Learning and Instruction 2021 Online Conference: Book of Abstracts* (p. 85). EARLI.
- Magnano, P., Craparo, G., & Paolillo, A. (2016). Resilience and emotional intelligence: Which role in achievement motivation. *International Journal of Psychological Research*, 9(1), 9-20.
- McMillan, J. H., & Schumacher, S. (2010). *Research in education: Evidence-based inquiry* (7th ed.). Pearson Education.
- McQuaid, R. W., & Lindsay, C. (2013). The concept of employability. In *Employability and local labour markets* (pp. 6-28). Routledge.
- Monteiro, S., Santos, S., Teixeira, J. N., Torres, L., & Palhares, J. (2025). Determinants of higher education graduates' employability: a scoping review. *Education+ Training*, 67(1), 56-74.
- Mustafa, N. K., Ibrahim, R., Awang, Z., Aizuddin, A. N., & Junid, S. M. A. S. (2024). Validation of a quantitative instrument measuring critical success factors and acceptance of Casemix system implementation in the total hospital information system in Malaysia. *BMJ open*, 14(8), e082547.
- Nghia, T. L. H., Pham, T., Tomlinson, M., Medica, K., & Thompson, C. (2020). Developing and Utilizing Employability Capitals. *Developing and Utilizing Employability Capitals*. Routledge.
- Okolie, U. C., Nwosu, H. E., & Mlanga, S. (2019). Graduate employability: How the higher education institutions can meet the demand of the labour market. *Higher education, skills and work-based learning*, 9(4), 620-636.
- Qinghua, L. & Ompok, C. S. @ C. C. (2022). The Influence of Social Support on Child-Parent Relationship Among Chinese Mothers of Preschoolers in Penampang, Sabah.

- Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 7(11), p. e001880. doi: 10.47405/mjssh.v7i11.1880.
- Reinius, H., Korhonen, T., & Hakkarainen, K. (2021). The design of learning spaces matters: Perceived impact of the deskless school on learning and teaching. *Learning Environments Research*, 24(3), 339-354.
- Shaheen, N., Shaheen, A., Ramadan, A., Hefnawy, M. T., Ramadan, A., Ibrahim, I. A., ... & Flouty, O. (2023). Appraising systematic reviews: a comprehensive guide to ensuring validity and reliability. *Frontiers in research metrics and analytics*, 8, 1268045.
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 2, 53.
- Tomlinson, M. (2012). Graduate employability: A review of conceptual and empirical themes. *Higher education policy*, 25(4), 407-431.
- Tran, T. T. (2016). Enhancing graduate employability and the need for university-enterprise collaboration. *Journal of Teaching and Learning for Graduate Employability*, 7(1), 58-71.
- Utkirov, A. (2024). Enhancing Alumni Employability: Aligning Higher Education Quality with Workforce Expectations. Available at SSRN 4948534.
- Wang, Y., Sangsawang, T., Vipahasna, P. P., Vipahasna, K., & Watkraw, W. (2025). Applying Factor Analysis to Assess Employment Competitiveness Strategies: A Data Science Perspective. *Journal of Applied Data Sciences*, 6(1), 726-741.
- Williams, B., Onsmann, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine*, 8(3), 1-13. <https://doi.org/10.33151/ajp.8.3.93>
- Xu, X. (2011). *Study on the measurement scale of school-enterprise cooperation behavior* [Unpublished master's thesis].
- Yang, Z., Shin, C., & Sharif, S. B. (2025). Classroom engagement in Chinese private colleges: The role of teacher-student interactions and peer relationships. *Humanities and Social Sciences Letters*, 13(3), 1130-1144. <https://doi.org/10.18488/73.v13i3.4390>
- Yang, Z., & Ompok, C. S. C. C. (2025). "The Relationship Between Peer Relationships and Classroom Engagement Among Undergraduate Private College Students", *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 10(4), p. e003271. doi: 10.47405/mjssh.v10i4.3271.
- Zhang, Y. C., Zhang, Y., Xiong, X. L., Liu, J. B., & Zhai, R. B. (2022). An empirical study on the improvement of college students' employability based on university factors. *Frontiers in Psychology*, 13, 793492.
- Zhang, J. (2025). Research on Innovation of Industry-Education Integration Model in Chinese Applied Vocational Universities. *Pacific International Journal*, 8(3), 110-116.