Environment and Social Psychology (2024) Volume 9 Issue 12 ISSN: 2424-8975 (O)
doi: 10.59429/esp.v9i12.3297 2424-7979 (P)

RESEARCH ARTICLE

Building capacity indicators for hotel management in Chinese vocational colleges: A social psychology perspective

Xuan Zhang[1], Kuan-Chun Tsai[1*], Hu Gao[1,2]

[1] *DhurakijPundit University, 110/1-4 Prachachuen Rd., Laksi, Bangkok, 10210, Thailand*

[2] *Shaanxi Vocational Academy of Art, No. 111, Wenyi South Road, Beilin District, Xian, Shanxi,710054, China*

*** Corresponding author:** Kuan-Chun Tsai, 639890020055@dpu.ac.th

ABSTRACT

Addressing the critical gap between hospitality education and industry demands, this study develops key capacity indicators for hotel management in Chinese vocational colleges from a social psychology perspective. A structured research method was adopted, and the evaluation indicators were determined using a literature review. The Modified Delphi Method (MDM) and the Analytic Hierarchy Process (AHP) were used to refine the indicators and analyze their importance, respectively, to establish a hierarchical evaluation system. In both methods, we selected 15 experts to participate. Grounded in the Context, Input, Process, Product (CIPP) model and Competency-Based Education (CBE) theory, the study integrates social psychological constructs such as motivation, cultural adaptability, and interpersonal skills into the capacity indicators. Engaging hotel management and vocational education experts through MDM, the study results in a hierarchical system with 4 primary indicators, 10 secondary indicators, and 21 tertiary indicators. AHP assesses the relative importance of each indicator, highlighting the significance of social and environmental factors in shaping educational outcomes. This framework offers a robust foundation for teaching evaluation and improvement in vocational colleges, providing insights for developing skilled professionals who meet industry demands and enhancing the quality of vocational hotel management education in China through social psychological lenses.

Keywords: Core Capacity Indicator; Chinese Vocational Hotel Management; Modified Delphi Method; Analytic Hierarchy Process; Context-Input-Process-Product Model; Competency-Based Education; Social Psychology; Educational Environment

1. Introduction

Vocational education in China plays a pivotal role in shaping a workforce equipped with practical skills tailored to industry-specific demands. In the hotel management sector, globalization and the surge in international tourism necessitate professionals who excel in both local and global contexts[1,2]. However, discrepancies persist between educational curricula and industry requirements, leading to gaps in critical areas such as language proficiency, technical expertise, and customer service skills[3,4].

From a social psychology perspective, these gaps can be attributed to factors such as student motivation, cultural adaptability, and the influence of the educational environment on learning outcomes. Research has

ARTICLE INFO
Received: 08 December 2024 | Accepted: 20 December 2024 | Available online: 30 December 2024

CITATION
Zhang X, Tsai KC, Gao H. Building Capacity Indicators for Hotel Management in Chinese Vocational Colleges: A Social Psychology Perspective. *Environment and Social Psychology* 2024; 9(12): 3297. doi:10.59429/esp.v9i12.3297

shown that student motivation plays a vital role in learning outcomes, with intrinsic and extrinsic motivation influencing academic performance and engagement in learning activities[5].The ability to adapt to different cultural contexts is essential for effective communication and learning, particularly in diverse educational settings. Closs et al. studied the importance of social relationships and support systems in enhancing students' learning experiences[6]. Furthermore, the physical, pedagogical, and psychosocial dimensions of the educational environment significantly influence students' learning outcomes. A supportive and well-structured learning environment can enhance motivation and engagement, leading to better academic performance[7].

To bridge these gaps, this study proposes a hierarchical evaluation index system tailored to the core competencies required for vocational hotel management programs (VHMP) in China. Anchored in the Context-Input-Process-Product (CIPP) model and Competency-Based Education (CBE) principles, this framework incorporates social psychological constructs to provide a comprehensive assessment of educational outcomes. In this context, educational outcomes refer to the measurable achievements of students in VHMP, which include knowledge acquisition, skill development, career readiness, and social and psychological growth.

The proposed framework is designed to be a versatile tool applicable by various stakeholders in hospitality education and industry. It uses a hierarchical system of core capacity indicators, developed through the Modified Delphi Method (MDM) and Analytic Hierarchy Process (AHP), to evaluate students' competencies at multiple levels (primary, secondary, and tertiary indicators). This framework integrates social psychological constructs, such as motivation, cultural adaptability, and interpersonal skills, and aligns with the CIPP model and CBE theory to assess both academic and professional readiness.

The CIPP model offers a systematic approach to program evaluation, considering context, input, process, and product[8]. CBE theory ensures that educational programs align with the specific, measurable skills demanded by the industry[9]. By integrating these models with social psychological theories, such as self-determination theory and social learning theory, this study aims to understand how social and environmental factors influence the development of core competencies in VHMP.

Employing the Modified Delphi Method (MDM) and Analytic Hierarchy Process (AHP), the study refines capacity indicators through expert feedback and assigns relevance-based weights to them[10]. This approach not only identifies essential competencies but also emphasizes the role of social and environmental influences in shaping educational outcomes, thereby equipping graduates with the skills needed to thrive in the hotel management industry and supporting the ongoing development of vocational education.

2. Materials and methods

This paper adopts a mixed research design, specifically, a structured research method based on social psychology, to construct capacity indicators for hotel management in Chinese vocational colleges. The process begins with a detailed literature review to identify initial evaluation indicators, followed by the refinement of these indicators through the MDM, and concludes with the application of the AHP to analyze the importance of each indicator, resulting in a hierarchical framework for core capacity indicators in VHMP in China in both qualitative and quantitative aspects.

2.1. Research sample

This chapter outlines the research sample and explains the implementation of the MDM, along with its data analysis process. It also introduces the AHP, detailing the steps involved and the results of its analysis.

The study unfolds in two key stages: the first employs the MDM, while the second utilizes the AHP. A group of 30 experts participated, with 15 contributing to each stage.

2.1.1. Modified delphi method research sample

Previous studies indicate that expert panels typically include 15 to 30 members[11], with a minimum of 13[12], though smaller or larger groups have also been used[13]. Armstrong[14] recommended that a Delphi panel generally consist of 5-20 members. For the MDM, experts are selected purposefully based on specific criteria:

a) Their opinions must remain anonymous to avoid external influence[15].

b) They should have a vested interest in the research outcomes[16,17].

c) They must possess both theoretical knowledge and hands-on experience related to the study[18].

d) They should hold leadership roles in vocational education or their professional field[19].

e) Their backgrounds should represent a variety of regions[20].

Based on these guidelines, a team of 15 experts was purposively selected for this study, including individuals from VHMP and the hotel industry. Vocational institution experts were required to have at least 10 years of teaching experience and hold the title of lecturer or higher, with a master's degree or above. Meanwhile, hotel industry experts needed at least 10 years of work experience in managerial roles and a bachelor's degree or higher.

2.1.2. Analytic hierarchy process research sample

Unlike traditional evaluation methods, the AHP uses multidimensional criteria focused on core professional skills, offering clear and meaningful data that help guide and improve students' skill development[21]. Aly and Vrana[22] noted that an expert's decision-making ability depends on their critical knowledge, extensive professional experience, and familiarity with the specific issue being evaluated.

Following these principles, this study assembled a panel of 15 experts, each with over 10 years of experience in vocational education or the hotel industry. Vocational education experts were required to hold a master's degree or higher, while industry professionals needed at least a bachelor's degree.

2.2. Modified delphi method

The Delphi method, developed between the 1940s and 1960s[23,24], is built on the idea that "many minds are better than one"[25]. This approach helps groups tackle complex problems by fostering structured communication among participants[26]. Over time, the method has evolved into what is now called the Modified Delphi Method, emphasizing anonymity, streamlined feedback, and alternative ways to reach consensus[27]. Traditional Delphi studies can struggle with achieving consensus when participants propose highly varied models or have differing backgrounds[28]. To address this, Murry and Hammons[15] developed the MDM, replacing the unstructured questionnaire in the first round with a structured one to keep the group focused on the research problem. This updated method maintains the same statistical analysis as the original but is more collaborative and effective[29].

This study uses the MDM to gather expert input on evaluating core capacity indicators for VHMP in China. The MDM ensures the reliability and scientific rigor of the competency index by designing and analyzing anonymous expert surveys[30]. A panel of 15 experts with significant experience in vocational education or the hotel industry formed the consultation group[31]. The initial evaluation index questionnaire was created using insights from relevant literature, policy documents, the CIPP model, and CBE principles.

The survey was distributed via email using an anonymous, non-intervention approach. After each round, qualitative data were reviewed to minimize individual bias[32]. The competency index was refined based on expert feedback until a consensus was achieved. To measure expert opinions, a 5-point Likert Scale was employed (1 = very inappropriate, 5 = very appropriate), and the averages were calculated for analysis.

2.2.1. Data analysis

a) Expert Positive Coefficient (EPC)

One key reason the Delphi method is so effective is the active participation of experts[26]. This participation is often measured by the response rate, representing the proportion of experts who complete the survey compared to the total number invited. A response rate of 70% or more is generally seen as an indicator of strong expert engagement and interest[33].

b) Expert Authority Coefficient (Cr)

The Cr is a key measure used to evaluate the reliability and expertise of participants in Delphi studies[34]. A Cr value of 0.7 or higher is generally considered reliable and indicates a solid level of expert credibility[35].

c) Expert Consensus Coefficient (ECC)

To analyze Delphi data, researchers must define "consensus" in quantitative terms, though there is no universal definition. It is up to the researcher to set the guiding principle [36]. In earlier studies, the Median (Med) of a Likert scale has often been used to determine expert consensus[37]. The Mean (M), Median (Med), and Mode (MO) are commonly used in Delphi studies to measure the central tendency of data, while Standard Deviation (SD) and Quartile Deviation (QD) help measure the spread or variability of the data[38]. In the MDM, agreement among participants is assessed using Kendall's coefficient of concordance (Kendall's W) and the Coefficient of Variation (CV)[39]. Based on the analysis of existing literature, the following values are used to determine the appropriateness of an indicator:

- An M greater than 4 indicates strong consensus[40].
- A Med greater than 3.25 suggests agreement[41].
- An MO of 4 or higher on a 5-point Likert scale indicates a significant level of agreement[42].
- Kendall's W ranges from 0 to 1, with higher values showing better consistency. The CV, calculated as the ratio of SD to the M, indicates greater consistency with lower values[41]. A Kendall's W between 0.2 and 0.5, and a CV of less than 0.5, suggests sufficient consensus across different aspects of an indicator[43].
- The SD measures how spread out the data is from the mean. A higher SD reflects greater variation in the data[44], while a lower SD indicates that the data points are closer to the mean[45].

2.3. Analytic hierarchy process

The AHP, introduced by American operations researcher Thomas L. Saaty in 1970s[46], helps decision-makers break down complex problems, compare different factors, and find the best possible solution. In this study, the AHP was applied to rank the importance of core capacity indicators for VHMP in China, based on an analysis from the MDM. Experts were asked to complete electronic questionnaires, and their responses were used to rank the indicators.

The AHP model involves three key steps: constructing a hierarchical structure, filling out a judgment matrix, and performing a consistency test[47]. These steps help determine the weight of each core capacity indicator for VHMP in China.

2.3.1. Implementation process

The AHP is a decision-making method that breaks down complex decisions into different levels, such as goals, criteria, and alternatives, before conducting both qualitative and quantitative analyses[48]. In this study, the AHP was applied to determine the weight of evaluation indicators, based on the analysis from the MDM. The process of implementation includes the following steps:

a) Developing the Hierarchical Structure

In AHP, hierarchical levels are defined by specific standards. Typically, the structure is divided into three levels: the top level (goal level), the middle level (criteria level), and the bottom level (plan level) [49]. In vocational education, AHP can also include sub-criteria levels to further refine the evaluation process. In this study, the hierarchical structure was divided into four levels: goal level, criteria level, sub-criteria level, and plan level. The goal level focuses on "Building Capacity Indicators for Hotel Management in Chinese Vocational Colleges". The criteria level includes context evaluation, input evaluation, process evaluation, and product evaluation. The sub-criteria and plan levels were refined through two rounds of expert consultations, resulting in a well-organized, progressive hierarchical structure.

b) Constructing the Judgment Matrix

Once the hierarchical structure is created, pairwise comparisons are made to assess the relative importance of each element using the AHP nine-point scale (**Table 1**)[50].

Table 1. AHP evaluation scale table.

Evaluation Scale	Definition	Description
1	Equally Important	Equal strength; equally important when compared
3	Slightly Important	Slightly stronger, preference for one factor based on criteria
5	Moderately Important	Moderately stronger, preference for one factor based on criteria
7	Very Important	Strong preference for one factor
9	Extremely Important	Absolute preference for one factor
2, 4, 6, 8	Intermediate Values	Intermediate values between two adjacent scales

**This table presents the AHP Evaluation Scale Table.*

During the analysis of the judgment matrix, each element is compared and evaluated individually according to the standards in **Table 1**. This process gradually forms a judgment matrix that highlights the differences between the various comparison objects. This matrix is an n-order comparison matrix A[51]. Matrix A is built from the pairwise comparison results, which allows for the precise quantification of the relative importance or relationships between the factors[52]. By thoroughly analyzing these comparisons, Matrix A provides a solid foundation for subsequent data processing and decision-making[53].

$$A_{n\times n} = \begin{bmatrix} a_{11} & a_{12} & a_{1..} & a_{1n} \\ a_{21} & a_{22} & a_{2..} & a_{2n} \\ a_{..} & a_{..} & a_{..} & a_{..} \\ a_{n1} & a_{n2} & a_{n..} & a_{nn} \end{bmatrix} \quad (1)$$

In the process of merging expert matrices, the geometric mean method is used. First, the scoring matrices from each of the m experts (m = 1, 2, ..., k) are ranked according to their scores[54]. Then, the ranked matrices are multiplied together. This results in a scoring matrix that combines the information from all the

experts[55]. Finally, to ensure the uniqueness of the merged matrix, the matrix is processed by taking the m-th root, creating a unique integrated matrix[56]. The calculation formula for $\overline{A}$ is as follows:

$$\overline{A} = (\prod_{k=1}^{m} a_{ij}^{k})^{\frac{1}{m}} \quad (2)$$

c) Calculating Factor Weights

The weight vector plays a crucial role in determining the importance of various factors, guiding decision-making, improving choices, and clarifying the reasoning behind decisions[57]. In this study, Yaahp software was used to analyze the data and calculate the weight vector for each indicator. The combined matrix is then used to calculate the weights using the geometric mean method, as shown in the following formula:

$$W_i = \frac{(\prod_{j=1}^{n} a_{ij})^{\frac{1}{n}}}{\sum_{i=1}^{n} (\prod_{j=1}^{n} a_{ij})^{\frac{1}{n}}} \quad , \quad i = 1,2,3..,n \quad (3)$$

d) Consistency Check

In pairwise comparisons, the criteria are ranked in order of importance. To determine if a model is valid, its consistency must be checked. The Consistency Ratio (C.R.) is typically used to indicate the result of this check. If the C.R. is less than 0.1, the model passes the consistency test. In this study, all C.R. were below 0.1, ensuring the accuracy of the weight calculations. The formula for calculating C.R. is as follows:

$$C.R. = \frac{C.I.}{R.I.} \quad (4)$$

The Random Index (R.I.) changes based on the order of the matrix, as shown in **Table 2**. The Consistency Index (C.I.) is calculated using the following formula:

$$C.I. = \frac{\lambda max - n}{n-1} \quad (5)$$

In the formula, λ_{max} denotes the largest eigenvalue of the judgment matrix, while n refers to the matrix order, or the number of criteria or options.

Table 2. Random indices calculated.

Level	1	2	3	4	5	6	7	8	9	10	11	12
R.I.	0.00	0.00	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48

**This table presents the AHP Random Index Table.*

2.4. Integrating social psychological constructs

To align with the social psychology perspective, this study integrates constructs such as student motivation, cultural adaptability, and interpersonal skills into the capacity indicators. These constructs are essential in understanding how social interactions and environmental factors within vocational colleges influence the development of core competencies in hotel management students. The integration of these constructs ensures that the capacity indicators not only assess technical skills but also the social and psychological readiness of students to meet industry demands.

Research indicates that student motivation significantly impacts learning outcomes. Intrinsic motivation, which arises from personal interest in the subject matter, enhances engagement and persistence in learning tasks. On the other hand, extrinsic motivation, driven by external rewards or pressures, can also influence academic performance but may not foster deep learning[58]. According to the expectancy-value theory of

motivation, students who believe in their ability to succeed and find value in their tasks are more likely to achieve better outcomes[59]. This understanding underscores the importance of incorporating motivation into capacity indicators, as motivated students are more likely to develop the competencies needed in the hotel management sector.

Cultural adaptability is crucial for students in the hospitality industry, where interactions with diverse clientele are common. The ability to navigate different cultural contexts enhances communication and service delivery, which are vital skills in hotel management. Research has shown that cultural adaptability is linked to effective communication and learning, particularly in international settings[60]. By integrating cultural adaptability into capacity indicators, the framework acknowledges the necessity for students to develop skills that enable them to thrive in a globalized industry.

Interpersonal skills, including communication, teamwork, and emotional intelligence, are essential for success in the hospitality sector. These skills facilitate effective interactions with colleagues and customers, contributing to a positive service experience. Studies highlight that strong interpersonal skills are associated with better career outcomes and job satisfaction in hospitality roles[61]. By including interpersonal skills in the capacity indicators, the study emphasizes the importance of social competencies alongside technical skills.

The educational environment plays a significant role in shaping student outcomes. A supportive and well-structured learning environment can enhance motivation and engagement, leading to improved academic performance[62]. The integration of social psychological constructs into the capacity indicators allows for a comprehensive assessment of how the educational context influences the development of core competencies in hotel management students.

In conclusion, the incorporation of student motivation, cultural adaptability, and interpersonal skills into the capacity indicators provides a holistic approach to evaluating the readiness of hotel management students. This framework not only addresses the technical competencies required by the industry but also emphasizes the importance of social and psychological factors that contribute to student success.

3. Results

3.1. Results of the expert questionnaire in relation to the MDM

The design of the MDM expert questionnaire in this study was based on a review of relevant literature. It included an introduction, instructions for completing the questionnaire, a glossary of terms, and a section for scoring the indicators. The indicators comprised 4 primary indicators, 10 secondary indicators, and 25 tertiary indicators. The questionnaire used a 5-point Likert scale, with experts selecting responses based on their opinions. “1” represented “very inappropriate”, and a “5” represented “very appropriate”. If experts chose “1, 2, 3, or 4” the indicator was considered not very appropriate, and they were asked to provide suggestions for improvement.

The first-round questionnaire was distributed from July 17 to July 28, 2024, and the second-round questionnaire from July 29 to August 2, 2024. The results showed that both rounds had a 100% response rate, meaning the EPC was 100%, reflecting strong engagement from the consulted experts. During the first round, 10 experts (66.67% of the total) offered constructive feedback on the indicators. This demonstrated high engagement from the experts. In the second round, no experts suggested further modifications, indicating a high level of consensus. The Cr of the experts in the survey was above 0.8, suggesting the high quality of the expert group.

After two rounds of expert consultation, the CV and Kendall's W for each level were calculated. The CV for the primary indicators ranged from 0.072 to 0.168, for the secondary indicators from 0 to 0.224, and for the tertiary indicators from 0 to 0.116, showing a strong consensus among experts on the appropriateness of the evaluation indicators. Additionally, Kendall's W for both rounds were below 0.5, indicating good consistency in expert opinions and reliable results.

In the primary indicator analysis, the M for the Context evaluation exceeded 4, reflecting high satisfaction. Both the Med and MO were 5, indicating that most experts rated it highly, with strong consistency. The CV was 0.072, further demonstrating consistency in ratings. The M for the Input evaluation was also greater than 4, signaling a generally positive assessment. Again, both Med and MO were 5, with most ratings at the highest level. The CV was 0.168, showing slight variation but still maintaining overall consistency. The M for the Process evaluation was above 4, indicating very high satisfaction. Both Med and MO were 5, showing near-perfect agreement among experts. The CV was 0.086, indicating excellent consistency. The M for the Product evaluation also exceeded 4, with Med and MO at 5, indicating that most experts rated it highly. The CV was 0.143, confirming good consistency in the ratings.

All secondary indicators had an M above 4, pointing to a trend of positive feedback. Each secondary indicator had a Med higher than 3.25, with most Med values at 5, meaning that at least half of the experts rated these indicators highly. The majority of secondary indicators had a MO of 5, indicating that 5 was the most frequent rating, showing strong consistency in evaluations. The CV was low, reinforcing the consistency in the responses. The M for the tertiary indicators was above 4, suggesting positive evaluations from the experts. This shows that the experts considered these indicators highly relevant and important for assessing core competencies in hotel management. Notably, Med and MO scores ranged from 4 to 5, confirming that most experts gave high ratings, demonstrating consistency in their evaluations.

Based on these results, the core competencies and competency indicators for the VHMP in China are highly relevant and consistent. It can be concluded that the four primary indicators comprehensively cover the essential core competencies for a VHMP in China. Therefore, the expert group showed a high level of recognition and agreement regarding the indicators, as shown in **Table 3**.

Table 3. Hierarchical evaluation index system for core competencies in VHMP in China.

Primary Indicator	Secondary Indicator	Tertiary Indicator
A Context	A1. Educational Background	A1.1. Students are able to participate in relevant seminars, workshops, or competitions.
	A2. Cultural Adaptability	A2.1. Students can adapt to different cultural environments. A2.2. Students are capable of understanding and respecting guests and colleagues from diverse cultural backgrounds.
	A3. Personal Interests and Motivation	A3.1. Students show interest in the tourism and hotel industry.
B Input	B1. Mastery of Professional Knowledge	B1.1. Students possess strong theoretical knowledge in hotel management. B1.2. Students are skilled at applying practical hotel management knowledge.
	B2. Teacher Qualifications and Teaching Methods	B2.1. Students can gain insights from teachers' industry experience and research. B2.2. Students improve their learning outcomes through case studies, field visits, and discussions led by teachers.

Primary Indicator	Secondary Indicator	Tertiary Indicator
C Process	C1. Internship and Project Participation	C1.1. Students perform effectively at internship sites.
		C1.2. Students take responsibility and complete tasks during internships.
		C1.3. Students achieve significant results in their internships.
	C2. Teamwork and Leadership Development	C2.1. Students demonstrate strong communication and coordination in team projects.
		C2.2. Students effectively share resources within team projects.
		C2.3. Students take initiative in team projects.
		C2.4. Students apply innovative thinking in team projects.
		C2.5. Students make a positive impact within team projects.
D Product	D1. Employment Rate and Career Progression	D1.1. Students secure high-level positions in the job market.
		D1.2. Students have potential for career progression and advancement.
	D2. Acquisition of Professional Skills Certifications	D2.1. Students earn relevant professional certification.
	D3. Industry Recognition and Job Satisfaction	D3.1. Students possess industry-recognized skills.
		D3.2. Students receive high satisfaction ratings from their employers.

Table 3. (*Continued*)

** The data source is compiled by this research.*

3.2. Results of the AHP questionnaire in relation to the capacity index

The structure of the Capacity Index within the Hierarchical Evaluation Index System for Core Competencies in China's VHMP, based on the results of the two rounds of Delphi expert consultation, is shown in **Figure 1**.

The AHP questionnaire was distributed between August 3rd and August 10th, 2024. A total of 15 expert questionnaires were distributed, and all 15 valid questionnaires were returned, achieving a 100% response rate. The C.R. calculated using Yaahp software was below 0.1 for all matrices, indicating strong consistency in the hierarchical evaluation system for core competencies in VHMP.

Weights for the criteria-level indicators were calculated. After confirming that the judgment matrices from all 15 experts met the consistency requirement (C.R. < 0.1), the matrices were aggregated, with the combined matrix shown in **Table 4**. Data analysis revealed that (A) Context and (C) Process had the greatest impact on the overall evaluation system, with a particularly significant effect on (D) Product. This highlights the importance of Context and Process evaluations in assessing core competencies for VHMP. On the other hand, (B) Input had a smaller effect on (A) Context and (C) Process but still influenced (B) Input to some extent.

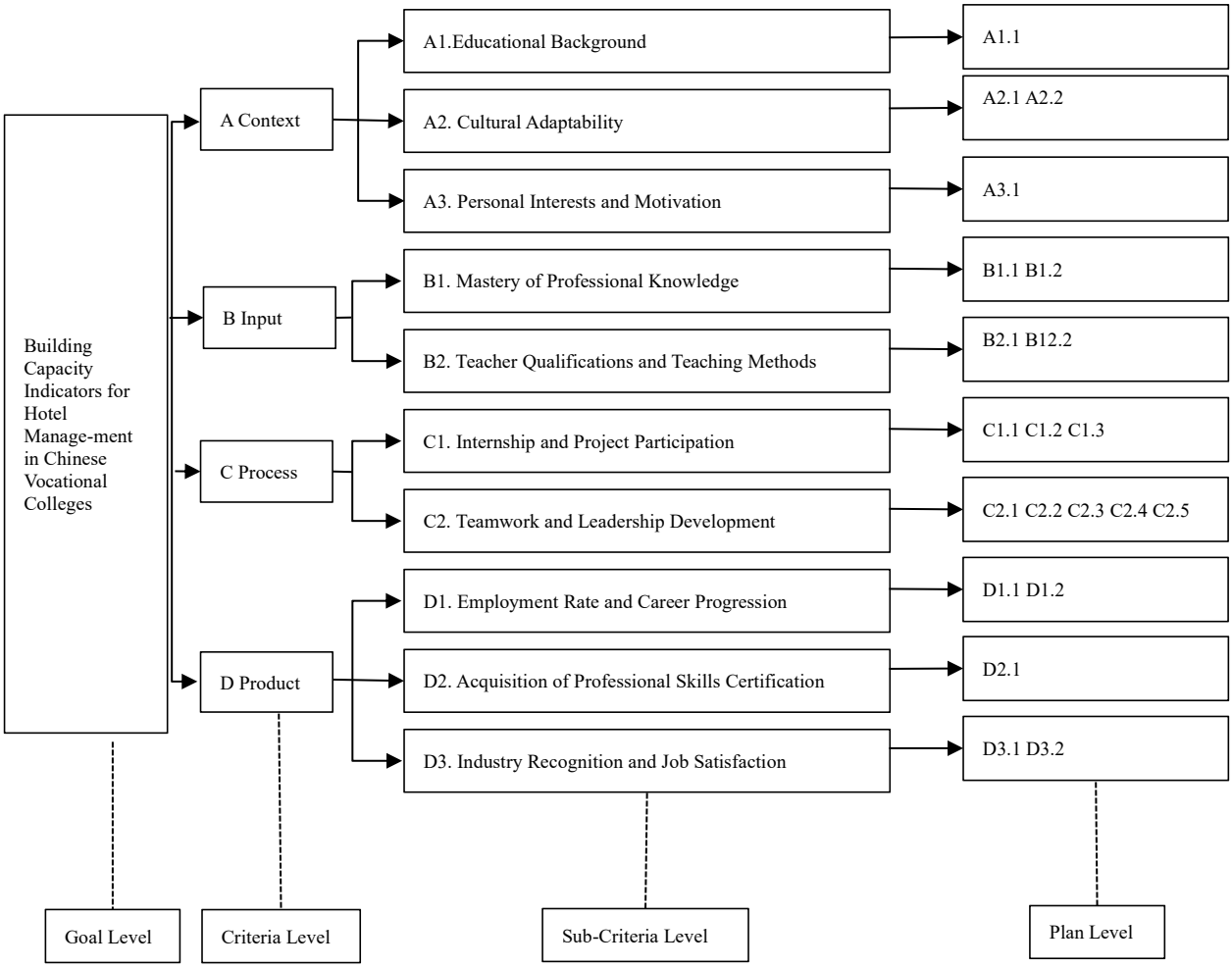

Figure 1. The structure of the capacity index of hierarchical evaluation index system for core competencies in VHMP in China.

Table 4. A-D aggregated matrix.

	A. Context	**B. Input**	**C. Process**	**D. Product**
A. Context	1	4.491	1.726	4.926
B. Input	.223	1	.310	.825
C. Process	.579	3.222	1	2.031
D. Product	.203	1.213	.492	1

** The data source is compiled by this research.*

In the hierarchical evaluation of core competencies for VHMP in China, the (A) Context indicator had the highest weight at 0.501, making it the most influential factor in the overall evaluation. The (C) Process indicator followed with a weight of 0.281, ranking it as the second most important. In contrast, the (D) Product and (B) Input indicators had relatively low weights, at 0.119 and 0.099, respectively, suggesting they have less influence on the overall evaluation.

In summary, (A) Context and (C) Process are the most critical indicators in the evaluation system and should be given primary focus.

Table 5. Results of AHP for A-D of the core competencies of VHMP in China.

Capacity Level	Relative Weight	λ_{max}	C.I.	C.R.	Importance Ranking
A. Context	0.501	4.020	0.007	0.007< 0.1	1
B. Input	0.099				4
C. Process	0.281				2
D. Product	0.119				3

** The data source is compiled by this research.*

3.2.1. Weight calculation for sub-criteria indicators

At the sub-criteria level, a judgment matrix was created to reflect the relative importance of the secondary indicators. Using expert scoring or data analysis, we compared each group of secondary indicators to determine their priority or ranking in **Table 6**.

Table 6. Results of AHP for A1-D3 of the core competencies of VHMP in China.

Capacity Level	Relative Weight	λ_{max}	C.I.	C.R.	Ranking in Dimension
A1	0.247	3.043	0.022	0.042< 0.1	2
A2	0.087				3
A3	0.665				1
B1	0.199	2	0	0< 0.1	2
B2	0.801				1
C1	0.796	2	0	0< 0.1	1
C2	0.204				2
D1	.657	3.020	0.010	0.019< .1	1
D2	.093				3
D3	.250				2

** The data source is compiled by this research.*

3.2.2. Weight calculation for plan-level indicators

The weights and consistency calculations for A1.1-D3.2 are shown in **Table 7**.

Table 7. Results of AHP for A1.1-D3.2 of the core competencies of VHMP in China.

Capacity Level	Relative Weight	λmax	C.I.	C.R.	Ranking in Dimension
A1.1	1	1	0	0< 0.1	1
A2.1	0.816	2	0	0< 0.1	1
A2.2	0.184				2
A3.1	1	1	0	0< 0.1	1
B1.1	0.606	2	0	0< 0.1	1
B1.2	0.394				2
B2.1	0.467	2	0	0< 0.1	2
B2.2	0.533				1
C1.1	0.474	3	0	0.001< 0.1	1

Capacity Level	Relative Weight	λmax	C.I.	C.R.	Ranking in Dimension
C1.2	0.185				3
C1.3	0.340				2
C2.1	0.236				2
C2.2	0.163				4
C2.3	0.140	5.055	0.014	0.012< 0.1	5
C2.4	0.247				1
C2.5	0.214				3
D1.1	0.576	2	0	0< 0.1	1
D1.2	0.424				2
D2.1	1	1	0	0< 0.1	1
D3.1	0.524	2	0	0< 0.1	1
D3.2	0.476				2

Table 7. (*Continued*)

** The data source is compiled by this research.*

3.2.3. AHP survey results

The weights and consistency of the A1.1-D3.2 integrated matrix were calculated to determine the judgment matrices and the weights for each indicator. These results are summarized in **Table 8**. The highest comprehensive weight is for A3.1, which reflects the student's interest in the tourism and hotel industry, with a weight of 0.333. This makes it the most important indicator. Next is A1.1, which measures the student's ability to participate in relevant seminars, workshops, or competitions, with a weight of 0.124. C1.1, which represents the student's ability to perform excellently during an internship, has a weight of 0.106. C1.3, indicating the student's ability to achieve significant results during the internship, has a weight of 0.076, and C1.2, reflecting the student's ability to take responsibility and complete tasks during the internship, has a weight of 0.042. These five indicators are highly significant in the overall evaluation, especially A3.1 and A1.1, which have a major influence on the assessment of core competencies in VHMP.

On the other hand, the following five indicators hold the lowest importance, with the smallest weights. C2.3, which reflects the student's ability to take initiative in team projects, has a weight of 0.008, as does A2.2, which measures the student's ability to understand and respect colleagues from different cultural backgrounds. B1.2, representing the student's ability to apply practical knowledge of hotel management, also has a weight of 0.008. D3.2, which indicates the student's ability to earn high satisfaction ratings from employers, has a weight of 0.014, and C2.5, which measures the student's ability to exhibit influence in team projects, has a weight of 0.012. These indicators contribute less to the overall evaluation, as shown by their low weights.

This analysis of indicator weights can help educational institutions focus on developing and assessing core competencies more effectively, improving teaching quality and enhancing students' professional skills through understanding the social and environmental influences.

Table 8. Results of AHP of the core competencies of VHMP in China.

Primary Indicator	Secondary Indicator	Tertiary Indicator
A Context (0.501)	A3. Personal Interests and Motivation (0.665)	A3.1. Students show interest in the tourism and hotel industry. (0.333)
	A1. Educational Background (0.247)	A1.1. Students are able to participate in relevant seminars, workshops, or competitions. (0.124)
	A2. Cultural Adaptability (0.087)	A2.1. Students can adapt to different cultural environments. (0.036)
		A2.2. Students are capable of understanding and respecting guests and colleagues from diverse cultural backgrounds. (0.008)
B Input (0.099)	B2. Teacher Qualifications and Teaching Methods (0.801)	B2.2. Students improve their learning outcomes through case studies, field visits, and discussions led by teachers. (0.042)
		B2.1. Students can gain insights from teachers' industry experience and research. (0.037)
	B1. Mastery of Professional Knowledge (0.199)	B1.2. Students are skilled at applying practical hotel management knowledge. (0.012)
		B1.1. Students possess strong theoretical knowledge in hotel management. (0.008)
C Process (0.281)	C1. Internship and Project Participation (0.796)	C1.1. Students perform effectively at internship sites. (0.106)
		C1.3. Students achieve significant results in their internships. (0.076)
		C1.2. Students take responsibility and complete tasks during internships. (0.042)
	C2. Teamwork and Leadership Development (0.204)	C2.4. Students apply innovative thinking in team projects. (0.014)
		C2.1. Students demonstrate strong communication and coordination in team projects. (0.014)
		C2.5. Students make a positive impact within team projects. (0.012)
		C2.2. Students effectively share resources within team projects. (0.009)
		C2.3. Students take initiative in team projects. (0.008)
D Product (0.119)	D1. Employment Rate and Career Progression (0.657)	D1.1. Students secure high-level positions in the job market. (0.045)
		D1.2. Students have potential for career progression and advancement. (0.033)
	D3. Industry Recognition and Job Satisfaction (0.250)	D3.1. Students possess industry-recognized skills. (0.016)
		D3.2. Students receive high satisfaction ratings from their employers. (0.014)
	D2. Acquisition of Professional Skills Certifications (0.093)	D2.1. Students earn relevant professional certification. (0.011)

** The data source is compiled by this research.*

4. Discussion

This study, employing the CIPP model and CBE theory, developed a core competency index system for VHMP in China through MDM and AHP. The system includes 35 indicators in total, divided into 4 first-level, 10 second-level, and 21 third-level indicators, providing a nuanced and comprehensive assessment of students' core competencies from a social psychology perspective.

Context Evaluation (Weight: 0.501)

Context evaluation emerged as the most crucial element of the entire index system. This aligns with social psychological theories that emphasize the role of environmental factors in shaping individual behavior and motivation[63,64]. Both Liu et al.[63] and Amissah et al.[64] highlight that context evaluation should consider factors such as students' personal interests and educational backgrounds. Liu et al.[63] noted that this evaluation provides a foundation for students' career development, while Amissah et al.[64] emphasized the role of personal interest in motivating students to engage in their learning. From a social psychology perspective, a supportive and stimulating educational environment can enhance intrinsic motivation, leading to better learning outcomes and higher engagement in vocational programs.

Input Evaluation (Weight: 0.099)

Although input evaluation holds a relatively smaller weight in the overall index system, it remains a critical factor in shaping students' learning outcomes[65]. This evaluation encompasses teacher qualifications, teaching methods, and mastery of professional knowledge. Effective teaching strategies[66], extensive industry experience[67], and the integration of theory with practice[68] significantly enhance students' learning experiences and outcomes. From a social psychological standpoint, teacher-student interactions and the perceived competence of educators can influence students' self-efficacy and motivation, thereby affecting their overall performance and satisfaction.

Process Evaluation (Weight: 0.281)

Process evaluation plays a crucial role in assessing students' performance during their learning and internship experiences. Unlike other dimensions, it not only evaluates learning outcomes but also highlights the development of practical skills, particularly through internships and project participation. Bonfanti et al.[69] stressed the importance of practical experience in hotel management, describing internships as a vital link between classroom learning and real-world application. This aligns with the findings of this study, which identified internship and project participation (weight 0.796) as the most significant secondary indicator within process evaluation. Social psychological constructs such as teamwork, leadership, and innovative thinking are essential for effective collaboration and problem-solving in professional settings, further emphasizing the importance of process evaluation in vocational education.

Product Evaluation (Weight: 0.119)

Product evaluation is key to assessing students' actual achievements after completing their studies[70]. Previous research on product evaluation has largely focused on employment outcomes and industry adaptability post-graduation. For instance, Refugia[71] centered product evaluation on factors such as employment rate, career development, industry recognition, and satisfaction to assess students' competitiveness in the job market. Similarly, Okolie et al.[72] considered employment rate and career potential as direct indicators of the quality of education, stressing that students' performance in the workplace is a vital measure of educational effectiveness. While this study shares a similar focus, it also emphasizes the enhancement of students' abilities through practice and training. Aligning with the "high-level position competitiveness" theory by Wang and Tsai[68], this research highlights that students' leadership and team management skills are essential for competing for top-level positions. From a social psychology perspective, factors such as job satisfaction and industry recognition can significantly impact students' self-concept and career aspirations, thereby influencing their long-term professional success.

5. Conclusion

5.1. Research conclusions

This study employed the MDM, grounded in the CIPP model and CBE theory, to build capacity indicators for hotel management in Chinese vocational colleges. Yaahp software was used to analyze the results. The system includes four first-level indicators: Context, Input, Process, and Product. Among the 21 third-level indicators, the top five are: students' interest in the tourism and hotel industry, their ability to engage in relevant seminars, workshops, or competitions, their adaptability to different cultural environments, their capacity to understand and respect clients and colleagues from diverse cultural backgrounds, and their ability to enhance learning through case studies, field visits, and interactive discussions.

5.2. Research contributions

5.2.1. Theoretical contributions

At the theoretical level, this study's main contribution is the systematic development of a hierarchical evaluation index system for hotel management in Chinese vocational colleges, integrating social psychological constructs. This new system addresses a gap in research on evaluating core competencies in hotel management students at Chinese vocational colleges, offering a comprehensive and practical framework for academic discussion in related fields. The study highlights the dynamic nature of students' abilities, focusing on their development over time rather than just a static assessment. This approach makes the evaluation system more adaptable to real-world situations and can help predict students' career trajectories by considering the influence of social and environmental factors.

5.2.2. Practical contributions

On a practical level, this study offers useful tools and strategies for teaching management and improving students' professional abilities in VHMP. By systematically assessing students' core competencies, schools can more easily identify areas of strength and weakness, allowing students to gain a competitive edge in their future careers. This approach supports individualized development, enabling a more personalized teaching model that helps students enhance their professional skills to meet the demands of their future roles. Additionally, the evaluation system developed in this study can serve as a basis for school incentive mechanisms, providing a foundation for performance evaluations of both teachers and students.

5.3. Research limitations

Although this study makes significant theoretical and practical contributions in constructing a hierarchical evaluation system for the core competencies of VHMP students, some limitations still exist.

a) Limitations in Practical Application Verification

This study primarily focuses on developing a hierarchical evaluation system for assessing the core competencies of vocational hotel management students. It includes the theoretical analysis of indicators and the integration of expert opinions. However, since the research mainly concentrated on the design and refinement of the model, it has yet to be extensively tested and validated in real-world teaching environments. This limitation is typical in the early stages of research, especially when dealing with complex evaluation models and multi-level indicator systems[73].

b) Absence of Student Feedback Data

The focus of this study is on constructing a hierarchical evaluation system based on theoretical analysis and expert opinions, with the data primarily drawn from expert views and existing literature. However, this approach, particularly in the early stages of research, often faces challenges in incorporating direct student feedback data[74]. This lack of student input is a common limitation in many evaluation system development processes, especially when the research emphasizes theoretical design and indicator weight analysis[75].

Author Contributions

Writing—original draft preparation, Xuan Zhang; writing—review and editing, Kuan-Chun Tsai and Hu Gao. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

Adaptation highlights for ESP journal:

1. **Social Psychology Integration**: Emphasized social psychological constructs such as motivation, cultural adaptability, and interpersonal skills within the capacity indicators.
2. **Theoretical Framework Alignment**: Linked the CIPP and CBE models with social psychological theories, highlighting how environmental and social factors influence educational outcomes.
3. **Discussion Enhancement**: Discussed findings in the context of social psychology, elaborating on how social and environmental factors impact student competencies and motivations.
4. **Terminology and Focus Shift**: Adjusted terminology and focus to align with social psychological perspectives, ensuring relevance to ESP readers.
5. **Practical Implications**: Highlighted how understanding social and environmental influences can inform teaching strategies and educational practices in vocational settings.

References

1. Li, J., Pilz, M. International transfer of vocational education and training: A literature review. Journal of Vocational Education & Training 2023; 75(2):185-218. https://doi.org/10.1080/13636820.2020.1847566
2. Munir, M., Sinambela, E. A., Halizah, S. N., Khayru, R. K., et al. Review of vocational education curriculum in the fourth industrial revolution and contribution to rural development. Journal of Social Science Studies (JOS3) 2022; 2(1): 5-8. https://doi.org/10.56348/jos3.v2i1.20
3. Vo, N. T., Le, L. H. P., Lam, V. T. T. Challenges for student satisfaction of internship program in hospitality and tourism industry in Vietnam. Journal of Quality Assurance in Hospitality & Tourism 2022; 23(5): 1298-1324. https://doi.org/10.1080/1528008X.2021.1964414
4. Fraser, B. From hospitality classrooms to successful careers: A current appraisal of australian international hotel requirements. Journal of Hospitality & Tourism Education 2019; 32(4): 1-21. https://doi.org/10.1080/10963758.2019.1688161
5. Lo K W K, Ngai G, Chan S C F, et al. How students' motivation and learning experience affect their service-learning outcomes: A structural equation modeling analysis. Frontiers in Psychology 2022; 13: 825902. https://doi.org/10.3389/fpsyg.2022.825902
6. Closs L, Mahat M, Imms W. Learning environments' influence on students' learning experience in an Australian Faculty of Business and Economics. Learn Environ Res. 2022; 25(1):271-285. http://doi.org/10.1007/s10984-021-09361-2
7. Cao W, Yu Z. Exploring learning outcomes, communication, anxiety, and motivation in learning communities: a systematic review. Humanit Soc Sci Commun 2023; 10: 866. https://doi.org/10.1057/s41599-023-02325-2
8. Stufflebeam, D. L. The CIPP model for evaluation. Evaluation Models 2002; 49: 279-317. https://doi.org/10.1007/0-306-47559-6_16
9. Açıkgöz, T., Babadoğan, M. C. Competency-based education: Theory and practice. Psycho-Educational Research Reviews 2021; 10(3): 67-95. https://doi.org/10.52963/PERR_Biruni_V10.N3.06
10. Chang, X., Wang, Z. Assessing the development of primary English education based on CIPP model-a case study from primary schools in China. Frontiers in Psychology 2024; 15: Article e1273860. https://doi.org/10.3389/fpsyg.2024.1273860
11. Loo, R. The Delphi method: a powerful tool for strategic management. Policing: An International Journal of Police Strategies & Management 2002; 25(4): 762-769. https://doi.org/10.1108/13639510210450677

12. Buriack, P., & Shinn, G. C. Mission, initiatives, and obstacles to research in agricultural education: A national Delphi using external decision-makers. Journal of Agricultural Education 1989; 30(4): 14-23. https://doi.org/10.5032/jae.1989.04014
13. Powell, C. The Delphi technique: myths and realities. Journal of Advanced Nursing 2003; 41(4): 376-382. https://doi.org/10.1046/j.1365-2648.2003.02537.x
14. Armstrong, J. S. (1985). Long range forecasting: From crystal ball to computer, 2nd ed. New Your: Wiley.
15. Murry Jr, J. W., Hammons, J. O. Delphi: a versatile methodology for conducting qualitative research. The Review of Higher Education 1995; 18(4): 423-436. https://doi.org/10.1353/rhe.1995.0008
16. Hsu, C. C., Sandford, B. A. Minimizing non-response in the Delphi process: How to respond to non-response. Practical Assessment, Research & Evaluation 2007; 12(17): 62-78. https://doi.org/10.7275/by88-4025
17. Preble, J. F. The selection of Delphi panels for strategic planning purposes. Strategic Management Journal 1984; 5(2): 157-170. https://doi.org/10.1002/smj.4250050206
18. Hsu, C. C., Sandford, B. A. The Delphi technique: Making sense of consensus. Practical Assessment, Research, and Evaluation 2007; 12(1): 2-10. https://doi.org/10.7275/pdz9-th90
19. Holloway, K. Doing the E-Delphi: Using online survey tools. CIN: Computers, Informatics, Nursing 2012; 30(7): 347-350. https://doi.org/10.1097/NXN.0b013e31825e8923
20. Gill, F. J., Leslie, G. D., Grech, C., et al. Using a web-based survey tool to undertake a Delphi study: Application for nurse education research. Nurse Education Today 2013; 33(11): 1322-1328. https://doi.org/10.1016/j.nedt.2013.02.016
21. Zhao, R., Liu, F., Zhu, K.. Establishment of an evaluation index system of competencies for college senior students in general practice medicine in Anhui province, China. International Journal of General Medicine 2024; 17: 85-92. https://doi.org/10.2147/IJGM.S420418
22. Aly, S., Vrana, I. Evaluating the knowledge, relevance and experience of expert decision makers utilizing the Fuzzy-AHP. Agricultural Economics 2008; 54(11): 529-535. https://doi.org/10.17221/264-AGRICECON
23. Landeta, J. Current validity of the Delphi method in social sciences. Technological Forecasting and Social Change 2006; 73(5): 467-482. http://doi.org/10.1016/j. techfore.2005.09.002
24. Dalkey, N., Helmer, O. An experimental application of the Delphi method to the use of experts. Management Science 1963; 9(3): 458-467. https://doi.org/10.1287/mnsc.9.3.458
25. Dalkey, N. (1972). Studies in the quality of life. Lexington Books.
26. Linstone, H. A., Turoff, M. (1975). The Delphi method: Techniques and applications. Addison-Wesley.
27. Cabero, A. J. Formación del profesorado universitario en TIC. Aplicación del método Delphi para la selección de los contenidos formativos. Educación XX1 2014; 17 (1): 111-132. http://doi.org/10.5944/educxx1.17.1.10707
28. Paul, C. L. A modified delphi approach to a new card sorting methodology. Journal of Usability Studies 2008; 4(1): 7-30. https://dl.acm.org/doi/abs/10.5555/2835577.2835579
29. Graefe, A., Armstrong, J. S. Comparing face-to-face meetings, nominal groups, Delphi and prediction markets on an estimation task. International Journal of Forecasting 2011; 27(1): 183-195. https://doi.org/10.1016/j.ijforecast.2010.05.004
30. Wang, F., Lu, Y., Li, J., Ni, J. Evaluating environmentally sustainable development based on the PSR framework and variable weigh analytic hierarchy process. International Journal of Environmental Research and Public Health 2021; 18(6): 1-16. https://doi.org/10.3390/ijerph18062836
31. Xie, L., Feng, M., Cheng, J., et al. Developing a core competency training curriculum system for emergency trauma nurses in China: a modified delphi method study. BMJ Open 2023; 13(5): Article e066540. https://doi.org/10.1136/bmjopen-2022-066540
32. Infante-Rivard, C., Cusson, A. Reflection on modern methods: Selection bias-a review of recent developments. International Journal of Epidemiology 2018; 47(5): 1714-1722. https://doi.org/10.1093/ije/dyy138
33. Shi, C., Zhang, Y., Li, C., Li, P., et al. Using the delphi method to identify risk factors contributing to adverse events in residential aged care facilities. Risk Management Healthcare Policy 2020; 13: 523-537. https://doi.org/10.2147/RMHP.S243929
34. Foth, T., Efstathiou. N., Vanderspank-Wright. B., et al. The use of Delphi and Nominal Group Technique in nursing education: A review. International journal of nursing studies 2016; 60: 112-120. https://doi.org/10.1016/j.ijnurstu.2016.04.015
35. Babbie., E. (2007). The practice of social research (10the). Thompson Wadsworth.
36. Jorm, A. F. Using the Delphi expert consensus method in mental health research. Australian & New Zealand Journal of Psychiatry 2015; 49(10): 887-897. https://doi.org/10.1177/0004867415600891
37. Hill, K. Q., Fowles, J. The methodological worth of the Delphi forecasting technique. Technological Forecasting and Social Chang 1975; 7(2): 179-192. http://dx.doi.org /10.1016/0040-1625(75)90057-8.
38. Siraj, S., Ali, A.. Principals projections on the Malaysian secondary school future curriculum. International Education Studies 2008; 1(4): 61-78. https://doi.org/10.5539/ies.v1n4p61

39. Ruan, Y., Song, S. J., Yin, Z. F., et al. Comprehensive evaluation of military training-induced fatigue among soldiers in China: A delphi consensus study. Frontiers in Public Health 2022; 10: Article e1004910. https://doi.org/10.3389/fpubh.2022.1004910
40. Zheng, J., Lou, L., Xie, Y., et al. Model construction of medical endoscope service evaluation system-based on the analysis of delphi method. BMC Health Services Research 2020; 20(1): Article e629. https://doi.org/10.1186/s12913-020-05486-x
41. Ab Latif, R., Mohamed, R., Dahlan, A., et al. Using Delphi technique: making sense of consensus in concept mapping structure and multiple choice questions (MCQ). Education in Medicine Journal 2016; 8(3): 89-98. http://dx.doi.org/10.5959/eimj.v8i3.421
42. Harpe, S. E. How to analyze Likert and other rating scale data. Currents in Pharmacy Teaching and Learning 2015; 7(6): 836–850. https://doi.org/10.1016/j.cptl.2015.08.001
43. Bi, Y. F., Mao, J. Y. Application of Delphi method in traditional Chinese medicine clinical research. Journal of Chinese Integrative Medicine 2012; 10(3): 264-270. https://doi.org/10.3736/jcim20120304
44. Liu, G., Zhou, J., Jia, B., et al. Advance short-term wind energy quality assessment based on instantaneous standard deviation and variogram of wind speed by a hybrid method. Applied Energy 2019; 238: 643-667. https://doi.org/10.1016/j.apenergy.2019.01.105
45. Goodhue, D. L., Lewis, W., Thompson, R. Does PLS have advantages for small sample size or Non-Normal data? MIS Quarterly 2012; 36(3): 981–1001. https://doi.org/10.2307/41703490
46. Saaty, T. L. A scaling method for priorities in hierarchical structures. Journal of Mathematical Psychology 1977; 15(3): 234-281. https://doi.org/10.1016/0022-2496(77)90033-5
47. Hong, C. M. Students' tendencies in choosing Technical And Vocational Education And Training (TVET): Analysis of the influential factors using analytic hierarchy process. Turkish Journal of Computer and Mathematics Education 2021; 12(3): 2608-2615. https://doi.org/10.17762/turcomat.v12i3.1262
48. Khan, A. U., Ali, Y. Analytical hierarchy process (AHP) and analytic network process methods and their applications: A twenty year review from 2000-2019. International Journal of the Analytic Hierarchy Process 2020; 12(3): 369-459. http://orcid.org/0000-0002-7612-497X
49. Schmidt, K., Aumann, I., Hollander, I., et al. Applying the analytic hierarchy process in healthcare research: a systematic literature review and evaluation of reporting. BMC Medical Informatics and Decision Making 2015; 15: 1-27. https://doi.org/10.1186/s12911-015-0234-7
50. Saaty, R. W. The analytic hierarchy process-what it is and how it is used. Mathematical Modelling 1987; 9(3-5): 161-176. https://doi.org/10.1016/0270-0255(87)90473-8
51. Yaraghi, N., Tabesh, P., Guan, P., et al. Comparison of AHP and monte carlo AHP under different levels of uncertainty. IEEE Transactions on Engineering Management 2015; 62(1): 122-132. https://doi.org/10.1109/TEM.2014.2360082
52. Podvezko, V. Application of AHP technique. Journal of Business Economics and Management 2009; 10(2): 181-189. https://doi.org/10.3846/1611-1699.2009.10.181-189
53. Saaty, T. L. Decision making - the analytic hierarchy and network processes (AHP/ANP). Journal of Systems Science and Systems Engineering 2004; 13(1): 1-35. https://doi.org/10.1007/s11518-006-0151-5
54. Vinogradova-Zinkevič, I., Podvezko, V., Zavadskas, E. K. Comparative assessment of the stability of AHP and FAHP methods. Symmetry 2021; 13(3): 479-504. https://doi.org/10.3390/sym13030479
55. Vidal, L.-A., Marle, F., Bocquet, J.-C. Using a delphi process and the analytic hierarchy process (AHP) to evaluate the complexity of projects. Expert Systems with Applications 2011; 38(5): 5388-5405. https://doi.org/10.1016/j.eswa.2010.10.016
56. Altintas, K., Vayvay, O., Apak, S.,et al. An extended GRA method integrated with fuzzy AHP to construct a multidimensional index for ranking overall energy sustainability performances. Sustainability 2020; 12(4): 1602-1623. https://doi.org/10.3390/su12041602
57. Dos Santos, M., de Araújo Costa, I. P., Gomes, C. F. S. Multicriteria decision-making in the selection of warships: A new approach to the AHP method. International Journal of the Analytic Hierarchy Process 2021; 13(1): 147-169. https://doi.org/10.13033/ijahp.v13i1.833
58. Deci E. L, Ryan R. M. The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry 2000; 11(4): 227-268. https://doi.org/10.1207/S15327965PLI1104_01
59. Wigfield, A., Eccles, J. S. Expectancy–value theory of achievement motivation. *Contemporary Educational Psychology 2000; 25(1): 68-81. https://doi.org/10.1006/ceps.1999.1015
60. Hammer, M. R., Bennett, M. J., Wiseman, R. Measuring intercultural sensitivity: The Intercultural Development Inventory. International Journal of Intercultural Relations 2003; 27(4): 421-443. https://doi.org/10.1016/S0147-1767(03)00032-4
61. Hammer, M. R., Bennett, M. J., Wiseman, R. Measuring intercultural sensitivity: The Intercultural Development Inventory. International Journal of Intercultural Relations 2003; 27(4): 421-443. https://doi.org/10.1016/S0147-1767(03)00032-4

62. Astin, A. W. What Matters in College? Four Critical Years Revisited. Jossey-Bass. 1993; https://doi.org/10.2307/1176821
63. Liu, Y., Liu, J., King, B.. Intercultural communicative competence: hospitality industry and education perspectives. Journal of Hospitality, Leisure, Sport & Tourism Education 2022; 30: Article e100371. https://doi.org/10.1016/j.jhlste.2022.100371
64. Amissah, E. F., Mensah, A. O., Mensah, I., et al. Students' perceptions of careers in Ghana's hospitality and tourism industry. Journal of Hospitality & Tourism Education 2020; 32(1): 1-13. https://doi.org/10.1080/10963758.2019.1654884
65. Toosi, M., Modarres, M., Amini, M., et al. Context, input, process, and product evaluation model in medical education: A systematic review. Journal of Education and Health Promotion 2021; 10(1): 1-18. https://doi.org/10.4103/jehp.jehp_1115_20
66. Bashir, M. J. K., Jun, Y. Z., Yi, L. J., et al. Appraisal of student's awareness and practices on waste management and recycling in the Malaysian University's student hostel area. Journal of Material Cycles and Waste Management 2020; 22(3): 916-927. https://doi.org/10.1007/s10163-020-00988-6
67. Karlberg, M., Bezzina, C. The professional development needs of beginning and experienced teachers in four municipalities in Sweden. Professional Development in Education 2020; 48(4): 1-18. https://doi.org/10.1080/19415257.2020.1712451
68. Wang, Y. F., Tsai, C. T. Employability of hospitality graduates: student and industry perspectives. Journal of Hospitality & Tourism Education 2014; 26(3): 125-135. https://doi.org/10.1080/10963758.2014.935221
69. Bonfanti, A., Vigolo, V., Yfantidou, G. The impact of the Covid-19 pandemic on customer experience design: The hotel managers' perspective. International Journal of Hospitality Management 2021; 94(1): Article e102871. https://doi.org/10.1016/j.ijhm.2021.102871
70. Duan, P. D., Xiang, J., Niu, H., et al. Construction of evaluation index for Chinese engineering undergraduates based on CIPP model. SAGE Open 2024; 13(1): Article e21582440221149415. https://doi.org/10.1177/21582440221149
71. Refugia, J. Employment status and the challenges encountered by criminology graduates. International Journal of Educational Management and Development Studies 2021; 2(3): 101-120. https://doi.org/10.53378/348743
72. Okolie, U. C., Nwajiuba, C. A., Binuomote, M. O., et al. Career training with mentoring programs in higher education. Education + Training 2020; 62(3): 214-234. https://doi.org/10.1108/et-04-2019-0071
73. Bolden, R., Kars-Unluoglu, S., Jarvis, C., et al. Paradoxes of multi-level leadership: Insights from an integrated care system. Journal of Change Management 2023; 23(4): 1-21. https://doi.org/10.1080/14697017.2023.2234388
74. Kooli, C. Chatbots in education and research: a critical examination of ethical implications and solutions. Sustainability 2023; 15(7): 1-15. https://doi.org/10.3390/su15075614
75. Wang, G., Liu, S. Adaptability evaluation of historic buildings as an approach to propose adaptive reuse strategies based on complex adaptive system theory. Journal of Cultural Heritage 2021; 52: 134-145. https://doi.org/10.1016/j.culher.2021.09.009