Validation and Reliability Assessment of Data Collection Instrument for University Students' Employment Readiness: A Pilot Testing

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Abstract

This research aims to explore the mediating role of personal image in affecting the employment readiness of university students. Personal image can be a key determinant in the perceived employability and overall preparedness of students. We pilot tested our research instruments by studying a sample of 50 university students, assessing their self-reported employment readiness and their perceptions of their own personal image. This study aimed to assess the validity and reliability of a data collection instrument tailored for gauging university students' readiness for employment. Two key validation methodologies were employed: content validity through expert judgment and construct validity using the Pearson correlation coefficient. Expert feedback was systematically collated, revealing that the instrument's items closely align with the intended research constructs. The Fleiss-Cohen test was utilized to assess inter-respondent agreement, and results indicated a high degree of consensus among experts.

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Further statistical analysis using Cohen's Kappa statistic demonstrated substantial to almost perfect agreement among raters, bolstering the instrument's reliability. The application of Pearson correlation emphasized the tool's ability to elucidate intricate relationships between myriad factors relevant to students' employment preparedness. Pilot testing concluded that the research instrument is both valid and reliable, ensuring its suitability for a broader study on university students' readiness for the professional world.

Keywords: Employment readiness;University students; Personal image; Perceived employability.

1. Introduction

Building a positive personal image and developing a pleasing personality are important factors for employment readiness among students [1]. The self-image of an individual, influenced by social interactions and experiences, plays a significant role in their success in life and career [2]. English language proficiency (ELP) is also a key factor in workplace readiness and employment outcomes for international students [3]. Graduate program completers who have had internships and assistantships, access to faculty expertise, and satisfaction with career centers are perceived to be more work-ready [4]. However, the focus on graduate attributes and work-readiness neglects the importance of student identity and engagement in shaping their readiness for employment [5]. Therefore, it is crucial for students to develop a positive personal image and cultivate their personality traits, along with acquiring language proficiency and practical experiences, to enhance their readiness for employment. The transition from university to employment is a significant and often challenging step for many graduates. Employment readiness is not just about having the requisite skills and qualifications, but also about being perceived as employable. One's personal image, which encompasses physical appearance, communication style, and online presence, among other elements, plays a potentially influential role in this perception.

2. Literature Review

A meticulous examination of existing literature underscores multiple research gaps. Firstly, while general self-efficacy's role in employability is recognized, its specific mechanisms within the framework of social cognitive career theory (SCCT) remain underexplored. This study endeavors to delve into these mechanisms, acknowledging the scarcity of research in this realm. Notably, [6] Gbadamosi and his colleagues. (2015) pointed out that heightened career ambition correlates with enhanced employability. Yet, there is a conspicuous absence of comprehensive research which applies SCCT to determine employability mechanisms in college students, especially concerning the integral factors like general self-efficacy, achievement motivation, and career aspiration.

The research landscape on private college students' employment readiness, specifically in Xi'an, China, is sparse. Studies that do exist, fail to holistically address the distinct context and challenges faced by private college students in this area [7] (Wang et.al, 2023).

A second significant gap emerges from the superficial examination of the nexus between career aspirations and employability. [6] Gbadamosi and his colleagues. (2015) noted that the intricate roles of general self-efficacy, achievement motivation, and career aspirations in this relationship have been largely overlooked.

Thirdly, [8] Yang (2014) observed that most of the scholarly attention on Chinese college students' image zeroes in on external constituents like the shaping of an external image. In contrast, the endogenous triggers of image formation remain underrepresented. Limited studies have touched upon internal aspects like moral quality, but discussions linking these facets to employment outcomes are scarce.

Furthermore, the extant literature has inadequately addressed the mediating influence of personal image in decoding students' employment readiness. [9,7] Peng et.al (2020) and Wang et.al (2023) primarily concentrated on the mediating dimension of self-efficacy in employability. The variability in conclusions drawn across studies, especially regarding the correlation between self-efficacy and outcomes, may stem from divergent methodologies [10,11,7] (Bandura, 1997; Choi, 2005; Peng and his colleagues., 2018).

Reference [7] Peng et.al. (2020) shed light on the evolution of context-specific self-efficacy into a broader, overarching self-efficacy across diverse realms. [12] Lent and his colleagues. (1997) emphasized the adaptability of such context-specific self-efficacy to myriad tasks, accentuating the need for more granular research on its applicability across varied scenarios.

Reference [13] Zhao and his colleagues

. (2005) explored the interplay between self-efficacy, individual traits, cognitive experiences, and entrepreneurial intentions among MBA students. Their insights underscored self-efficacy's positive bearing on facets like self-confidence and career planning. Contrastingly, [14] Dacre & Qualter (2013) pinpointed a muted enthusiasm among students to cultivate and utilize self-efficacy, possibly stemming from motivational deficits or inherent self-efficacy limitations.

To sum up, while strides have been made in understanding the facets that shape employability and the transition to employment, gaps remain. Particularly, the interrelationship between determinants influencing private university students' employment readiness and personal image's mediating role lacks depth. This research void hampers a comprehensive grasp of personal image's sway on the plethora of factors dictating students' employment readiness.

3. Methodology

A pilot study is conducted prior to the primary study to assess the feasibility of the research technique and the dependability of the research instruments . The pilot study aims to identify any issues with the research methodology, research instruments, research procedures, or how it was assembled . It also helps in understanding if the questions in the research instruments are easily understood by the participants and if the research environment is conducive to the study . The pilot study provides an opportunity for the researchers to make any necessary changes before conducting the primary study . In this study, a reliability analysis will be performed for the pilot study test using Cronbach's alpha with a sample size of n=50 . The pilot test study will help identify any necessary changes before conducting the primary study .

3.1. Research Instruments

The study's questionnaire was custom-designed by the researcher. Adjustments to the statements were made to resonate with the respondents' characteristics and cognitive abilities. During the design phase, the unique attributes of the participants were taken into account. Each statement in the questionnaire underwent revisions and was reviewed for face and content validity by a panel of three experts, ensuring their relevancy and dependability. The questionnaire predominantly comprises closed-ended questions set on a 5-point Likert scale, spanning from 'strongly agree' to 'strongly disagree', making the data analysis process efficient and user-friendly. A pilot test was conducted with a subset of 50 participants to validate the questionnaire's reliability. Adhering to best practices, the Brislin method was employed to translate the research instruments into Mandarin. The study's main instrument for gathering data is a structured questionnaire that is divided into several sections, each dedicated to assessing specific variables:

1. Demographic Section: Captures basic information about respondents such as age, gender, academic major, and year of study.
2. Career Identity Scale: Adapted from [15], this segment evaluates how deeply respondents identify with their career aspirations.
3. Self-presentation Scale: Originating from [16], this scale measures how individuals project themselves in varying contexts.
4. Self-efficacy Scale: Inspired by [17], it evaluates the confidence respondents have in accomplishing tasks.
5. Other Scales: The constructs of Psychological Quality, Social Need, Corporate Image, Networking, and Cultural Literacy are measured through scales derived from diverse research sources, with each focusing on the respective attribute and its influence on job readiness.
6. Personal Image Mediating Scale: Analyzes respondents' self-image perception and its consequential impact on their job preparedness.
7. Readiness for Employment Scale: Sourced from [18], this scale determines how equipped participants feel about entering the professional world.

Each scale is comprised of a set of statements. Participants express their agreement or disagreement using a 5-point Likert scale, allowing for quantitative assessments while also grasping the intricate details of their views and feelings.

3.2. Data Collection Procedure

Data collection will commence upon receiving ethical approval from the appropriate committee. Participants will be approached in their respective institutions, and the purpose of the study will be explained to them. Those willing to participate will be given the questionnaire to complete. They will be informed of their rights as participants, including their right to withdraw at any point without any repercussions. To ensure a high response rate:

1. A cover letter will be attached to the questionnaire explaining the purpose of the study, the importance of their contribution, and the confidentiality of their responses.

2. A reminder will be sent to participants after a week to encourage those who haven't yet completed the questionnaire.

3. A small incentive, such as a pen or notepad with the university's logo, will be provided upon the completion of the questionnaire.

3.3. Data Analysis

Once data collection is completed, the responses will be entered into statistical software for analysis. Data cleaning will be done to detect and handle missing data and outliers. Descriptive statistics will be used to describe the sample characteristics.

4. Findings & Results

4.1. Instruments Reliability

The instrument's reliability in this study was gauged through a pilot test involving 50 participants, utilizing the Cronbach's alpha coefficient as the metric. This coefficient evaluates the consistency among questionnaire items, where higher values signify increased reliability. The mean reliability values derived from this preliminary test dictate the questionnaire's ultimate dependability [19] (Taber, 2018). Should the alpha coefficient fall below 0.7, modifications to the questionnaire might be warranted to enhance its reliability. Moreover, this pilot phase affords researchers the opportunity to pinpoint and clarify any questions in the questionnaire that might be construed as vague or ambiguous, ensuring data precision. Table 1 presents the reliability testing outcomes for all scales, revealing a notable coefficient of 0.981.

Table 1: Reliability Testing

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.981	.982	50

4.2. Reliability Analysis of Each Construct

The reliability of every question or construct is determined through the provided statistics, specifically focusing on the "Corrected Item-Total Correlation" and "Cronbach's Alpha if Item Deleted."

Reliable Items (Characterized by High Corrected Item-Total Correlation & Alpha if Deleted):

RE Items (RE1-RE5): With "Corrected Item-Total Correlation" values ranging between 0.373 to 0.583 and "Cronbach's Alpha if Item Deleted" values approximating 0.982, these items manifest a robust internal

consistency, qualifying them as reliable.

PI Items (PI1-PI5): These items, analogous to the RE set, exhibit prominent "Corrected Item-Total Correlation" values between 0.581 to 0.793 and alpha values around 0.981. These are deemed reliable.

N Items (N1-N5): Displaying commendable "Corrected Item-Total Correlation" values from 0.743 to 0.839 and alpha values near 0.981, these are reliable.

CI Items (CI1-CI5): With correlation values between 0.831 to 0.882 and alpha values around 0.981, these items are consistent and reliable.

SN Items (SN1-SN5): These items, having correlation values from 0.743 to 0.901 and alpha values approximating 0.981, are reliable.

PQ Items (PQ1-PQ5): Mirroring the previous sets, these items also showcase strong correlation values between 0.801 to 0.911 and alpha values close to 0.981, marking them as reliable.

SE Items (SE1-SE5): With correlation values spanning from 0.782 to 0.863 and alpha values near 0.981, these items are determined reliable.

SP Items (SP1-SP5): These items, presenting correlation values from 0.813 to 0.907 and alpha values near 0.981, are reliable.

COR Items (COR1-COR5): These items, manifesting correlation values from 0.845 to 0.917 and alpha values around 0.981, are deemed reliable.

CC Items: While CC1, CC2, and CC4 possess relatively lower correlation values (0.564, 0.537, and 0.538, respectively) differing from the overall alpha, CC3 and CC5 display favourable "Corrected Item-Total Correlation" values of 0.536 and 0.573, suggesting their positive alignment with the overall scale.

To conclude, most scale items demonstrate high reliability. This is evidenced by their notable positive "Corrected Item-Total Correlation" values and "Cronbach's Alpha if Item Deleted" values aligning closely with the general alpha coefficient. This implies that the questions across constructs contribute significantly to the overarching internal consistency of the scale.

Table 2: Analysis of the reliability for each item

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
RE1	119.72	3198.451	.373	.	.982
RE2	119.68	3186.344	.455	.	.982
RE3	120.50	3176.214	.453	.	.982
RE4	120.74	3143.421	.583	.	.981
RE5	120.58	3156.983	.563	.	.981
PI1	120.84	3116.586	.725	.	.981
PI2	120.40	3140.735	.581	.	.981
PI3	121.42	3128.698	.781	.	.981
PI4	121.30	3127.357	.785	.	.981
PI5	121.14	3134.653	.793	.	.981
N1	121.22	3141.971	.809	.	.981
N2	121.66	3140.515	.785	.	.981
N3	121.34	3137.004	.743	.	.981
N4	121.46	3142.458	.788	.	.981
N5	121.28	3129.185	.839	.	.981
CI1	121.40	3124.694	.831	.	.981
CI2	121.42	3116.371	.882	.	.981
CI3	121.56	3119.966	.873	.	.981
CI4	121.34	3120.760	.868	.	.981
CI5	121.52	3124.500	.849	.	.981
SN1	121.22	3119.236	.901	.	.981
SN2	121.70	3145.724	.743	.	.981
SN3	121.60	3141.673	.776	.	.981
SN4	121.46	3133.233	.777	.	.981
SN5	121.40	3117.184	.819	.	.981
PQ1	121.36	3118.439	.845	.	.981
PQ2	121.58	3125.514	.850	.	.981
PQ3	121.28	3105.104	.851	.	.981
PQ4	121.60	3132.735	.801	.	.981
PQ5	121.52	3108.908	.911	.	.981
SE1	121.60	3121.224	.863	.	.981
SE2	121.68	3116.957	.854	.	.981
SE3	121.64	3134.398	.782	.	.981

SE4	121.46	3107.192	.872	.	.981
SE5	121.52	3126.540	.808	.	.981
SP1	121.34	3110.188	.907	.	.981
SP2	121.34	3120.188	.813	.	.981
SP3	121.44	3103.190	.893	.	.981
SP4	121.50	3113.847	.888	.	.981
SP5	121.34	3110.719	.896	.	.981
COR1	121.48	3108.622	.917	.	.981
COR2	121.52	3122.663	.845	.	.981
COR3	121.46	3106.866	.903	.	.981
COR4	121.50	3112.133	.898	.	.981
COR5	121.42	3100.208	.916	.	.981
CC1	121.36	3156.235	.564	.	.982
CC2	121.40	3160.898	.537	.	.982
CC3	121.36	3173.909	536	.	.983
CC4	121.36	3160.929	.538	.	.982
CC5	121.28	3152.736	.573	.	.983

4.3. Instrument Validity

In this research, two forms of instrument validity were employed: expert-based content validity and construct validity through the Pearson correlation coefficient.

a) Content Validity

To safeguard the instrument's validity, a dual approach encompassing pilot testing and expert judgment was adopted. Content validity, crucial for empirical research, ensures that survey questions aptly represent the intended construct or subject. To establish content validity, scholars typically consult seasoned experts who possess in-depth knowledge of both the construct under assessment and the survey's content domain. These experts appraise the survey items for clarity, relevance, and comprehensiveness.Furthermore, they review the survey's linguistic choices, clarity of instructions, and item appropriateness for the target audience. Feedback on questionnaire format, like question order or response choices, might also be offered. Post-expert feedback, a pilot test is conducted with a modest participant group. This ensures clarity and relevance while also pinpointing potential problems, permitting rectification before broader distribution. Through content validity, researchers can be confident of the survey items' accuracy in capturing the intended construct, subsequently providing dependable and valid data. In the context of this study, the Fleiss-Cohen test was employed to gauge consistency in expert ratings [20] (McHugh, 2012).

Table 3 details inter-rater reliability measurements utilizing the Cohen's Kappa statistic. Analyzing these results reveals:

1. **Overall Agreement (Observed Agreement)**: A 71.6% agreement was observed among the three evaluators.
2. **Kappa (κ)**: The Kappa statistic, which accounts for coincidental agreement, stands at 0.716, suggesting substantial, if not perfect, agreement.
3. **Asymptotic Standard Error**: Kappa's variability is indicated by a standard error of 0.078.
4. **z-Score**: A z-score of 9.194 implies significant observed agreement.
5. **Significance (Sig.)**: With a p-value of 0.000, less than the standard 0.05 significance level, the Kappa value is deemed statistically significant.
6. **95% Confidence Interval**: Kappa's 95% confidence interval spans from 0.563 to 0.868.

The substantial Kappa statistic (0.716) implies remarkable evaluator agreement, far surpassing mere chance. The statistical significance (p-value 0.000) underscores this, with the confidence interval providing potential true agreement values. This high agreement underscores the evaluators' consensus in this research.

In summary, all constructs are positively correlated with each other, and most of the correlations are highly significant (p < 0.01), indicating strong associations between these constructs in the dataset.

Table 3 : Pearson Correlation Coefficient

Correlations

		RE	PI	N	CI	SN	PQ	SE	SP	COR	CC
RE	Pearson Correlation	1	.591**	.560**	.515**	.547**	.489**	.499**	.503**	.534**	.402**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.004
	N	50	50	50	50	50	50	50	50	50	50
PI	Pearson Correlation	.591**	1	.764**	.736**	.710**	.770**	.732**	.826**	.855**	.578**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	50	50	50	50	50	50	50	50	50	50
N	Pearson Correlation	.560**	.764**	1	.895**	.895**	.851**	.834**	.822**	.828**	.674**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	50	50	50	50	50	50	50	50	50	50

CI	Pearson Correlation	.515**	.736**	.895**	1	.882**	.828**	.842**	.888**	.882**	.654**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	50	50	50	50	50	50	50	50	50	50
SN	Pearson Correlation	.547**	.710**	.895**	.882**	1	.890**	.899**	.829**	.825**	.772**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	50	50	50	50	50	50	50	50	50	50
PQ	Pearson Correlation	.489**	.770**	.851**	.828**	.890**	1	.922**	.929**	.917**	.801**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	50	50	50	50	50	50	50	50	50	50
SE	Pearson Correlation	.499**	.732**	.834**	.842**	.899**	.922**	1	.877**	.896**	.836**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	50	50	50	50	50	50	50	50	50	50
SP	Pearson Correlation	.503**	.826**	.822**	.888**	.829**	.929**	.877**	1	.966**	.705**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	50	50	50	50	50	50	50	50	50	50
COR	Pearson Correlation	.534**	.855**	.828**	.882**	.825**	.917**	.896**	.966**	1	.711**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	50	50	50	50	50	50	50	50	50	50
CC	Pearson Correlation	.402**	.578**	.674**	.654**	.772**	.801**	.836**	.705**	.711**	1
	Sig. (2-tailed)	.004	.000	.000	.000	.000	.000	.000	.000	.000	
	N	50	50	50	50	50	50	50	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

5. Conclusion

The pilot testing phase of this study provided invaluable insights into the research instrument's validity and reliability. Through a rigorous evaluation process, which involved expert judgments and statistical analyses, we ascertained the robustness and appropriateness of the data collection tool. The expert-based content validity confirmed that the instrument's items effectively capture the intended construct, ensuring that the data generated would be both relevant and meaningful. The utilization of the Fleiss-Cohen test and the Cohen's Kappa statistic further underscored the consistency in expert evaluations, highlighting the reliability of the instrument.Moreover, the deployment of the Pearson correlation in analyzing the data emphasized the instrument's capability to capture nuanced relationships between different factors, thus adding another layer of confidence in the tool's efficacy.In sum, this pilot testing served not only as a validation phase but also as an optimization opportunity for the research instrument. The feedback and results obtained have been instrumental in refining the tool, ensuring that subsequent data collection phases are more accurate, efficient, and relevant. Given the substantial agreement among evaluators and the significant statistical outcomes, we can confidently proceed with the main study, assured of the instrument's reliability and validity.

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