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VALIDITY AND RELIABILITY OF THE NEW STUDENT ADMISSION SYSTEM QUALITY QUESTIONNAIRE IN POSTGRADUATE PROGRAMS

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Abstract

This study aims to evaluate the quality of new student admission services and develop a reliable and valid questionnaire to measure four key constructs: admission system quality, intention to apply, prospective student satisfaction, and initial academic service effectiveness. Instruments used in this context often lack psychometric evidence, raising concerns about their reliability and accuracy. The questionnaire was developed through item generation based on theoretical reviews, expert validation, and a pilot test involving 34 postgraduate prospective students. Validity was assessed using Corrected Item–Total Correlation with reference to critical r values, while reliability was evaluated with Cronbach's Alpha, which showed a very high internal consistency (α = 0.992). These results confirm strong preliminary validity and reliability. Further validation through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) is planned for future studies with larger and more diverse samples to assess the instrument's factorial structure and model fit. The pilot test revealed that all 88 items exceeded the critical r threshold, confirming preliminary validity. However, the sample size and context limit generalizability, and future research should involve larger and more varied samples, as well as cross-institutional testing, to strengthen construct stability. This instrument can be effectively used for data-driven evaluation and quality improvement of student admission services in higher education institutions. It provides administrators with a reliable tool to enhance admission service delivery.

Keywords: student admission system; system quality; questionnaire validation; Cronbach's alpha; student satisfaction; intention to enroll.

Abstrak. Penelitian ini bertujuan untuk mengevaluasi kualitas layanan penerimaan mahasiswa baru dan mengembangkan kuesioner yang valid dan reliabel untuk mengukur empat konstruksi utama: kualitas sistem penerimaan, niat untuk mendaftar, kepuasan calon mahasiswa, dan efektivitas layanan akademik awal. Instrumen yang digunakan dalam konteks ini seringkali kurang memiliki bukti psikometrik, yang menimbulkan kekhawatiran mengenai keakuratan dan kredibilitas pengukuran. Kuesioner ini dikembangkan melalui pembuatan item berdasarkan tinjauan teoritis, validasi konten oleh para ahli, dan uji coba pilot yang melibatkan 34 calon mahasiswa pascasarjana. Validitas item dianalisis menggunakan Korelasi Item–Total yang Diperbaiki dengan mengacu pada nilai kritis r, sedangkan reliabilitas dievaluasi dengan Cronbach's Alpha, yang menunjukkan konsistensi internal yang sangat tinggi (α = 0,992). Hasil ini mengonfirmasi validitas dan reliabilitas awal yang kuat. Validasi lebih lanjut melalui analisis faktor eksploratori (EFA) dan analisis faktor konfirmatori (CFA) direncanakan untuk studi selanjutnya dengan sampel yang lebih besar dan lebih beragam untuk menilai struktur faktor dan kecocokan model instrumen. Uji coba pilot menunjukkan bahwa semua 88 item melebihi ambang batas r kritis, mengonfirmasi validitas awal. Namun, ukuran sampel dan konteks yang terbatas membatasi generalisasi hasil, dan penelitian selanjutnya perlu melibatkan sampel yang lebih besar dan beragam, serta pengujian lintas institusi untuk memperkuat stabilitas konstruk. Instrumen ini dapat digunakan secara efektif untuk evaluasi berbasis data dan perbaikan kualitas layanan penerimaan mahasiswa di institusi pendidikan tinggi. Ini memberikan alat yang reliabel bagi administrator untuk meningkatkan penyampaian layanan penerimaan.

Kata kunci: sistem penerimaan mahasiswa, kualitas sistem, validasi kuesioner, Cronbach's alpha, kepuasan mahasiswa, niat untuk mendaftar.

Background

Higher education plays a strategic role in developing human resources that are competent, adaptive, and competitive in the global era. This role extends beyond the provision of knowledge and technical competencies to include the development of character, creativity, critical thinking, and social skills required in a dynamic labor market. The quality of higher education is determined not only by curriculum design and instructional processes but also by the effectiveness of academic services and institutional management systems that support the overall educational experience. An integrated management system enables administrative, academic, and support services to function optimally, allowing students to experience meaningful and continuous learning.

Within this context, the new student admission phase represents the initial point of interaction between prospective students and the institution, playing a crucial role in shaping early perceptions of service quality. Prospective students' intention to apply is influenced by multiple factors, including institutional reputation, clarity of academic information, ease of application procedures, and experiences with campus service systems. Application processes that are accessible, informative, and responsive tend to strengthen applicants' motivation to continue registration, whereas complex or unclear procedures may discourage engagement from the outset. This issue is particularly relevant at the postgraduate level, where applicants exhibit diverse age profiles, professional backgrounds, and levels of digital literacy, thereby increasing the need for practical and user-friendly admission systems.

Beyond application intention, prospective student satisfaction represents a key indicator of higher education service quality. Satisfaction reflects the alignment between expectations and perceived service experiences and is associated with learning motivation, student retention, institutional loyalty, and positive university image. Prior studies demonstrate that prospective student satisfaction has strategic implications for institutional sustainability and academic reputation (Clemons & Jance, 2024; Bhattarai, 2023; Osman et al., 2024; Rasheed & Rashid, 2023; Supriyanto et al., 2024). Consequently, satisfaction should be viewed not only as a service quality indicator but also as a fundamental component of comprehensive higher education quality enhancement strategies.

Conceptually, the quality of new student admission systems can be explained through the Information Systems Success Model proposed by DeLone and McLean (2003), which posits that system success is determined by system quality, information quality, and service quality. These dimensions collectively influence user satisfaction and perceived organizational benefits. In the context of student admissions, admission system quality serves as a central construct affecting prospective students' psychological and behavioral outcomes, including application intention, satisfaction with admission services, and perceptions of initial academic service effectiveness. Therefore, admission system quality can be understood as an early determinant shaping user experience and institutional service success at the beginning of the student journey.

Despite the growing body of research on service quality and student satisfaction in higher education, the literature reveals persistent methodological challenges, particularly concerning measurement instrument quality. Systematic reviews indicate that many student satisfaction instruments are locally developed with limited reporting of psychometric evidence, especially regarding construct validity and adequate sample sizes (Yüksel et al., 2023). This issue is reinforced by studies that merely report validity and reliability testing without comprehensive statistical indices or systematic item development procedures (Amalia & Zuraidah, 2022; Bunawolo et al., 2024; Noor & Tanzil, 2020; Pratiwi et al., 2022).

Such limitations pose risks of measurement bias and inaccurate construct representation, potentially affecting research conclusions and data-driven policy decisions (Del Carmen Olmos-Gómez et al., 2023; Yüksel et al., 2023; Gonzales et al., 2025; Mahmoudi & Jouybari, 2025). Contemporary literature emphasizes that the development of educational service measurement instruments should follow multi-stage validation procedures, including theory-based item generation, content validity assessment, exploratory and confirmatory factor analyses, internal reliability testing, temporal stability evaluation, and cross-group invariance testing (Zhuang et al., 2025; Del Carmen Olmos-Gómez et al., 2023; Yüksel et al., 2023; Gonzales et al., 2025; Mahmoudi & Jouybari, 2025).

In the context of new student admissions, the need for validated instruments becomes increasingly critical because this process represents the initial stage in shaping perceptions of institutional service quality. Measurement instruments must adequately capture system quality dimensions such as usability, reliability, clarity of information, and user experience (Amalia & Zuraidah, 2022; Pratiwi et al., 2022; Uska et al., 2020; Alam & Harya, 2025; Zulvi et al., 2025). Additionally, instruments should accurately assess application intention and registration experiences, which have been linked to applicants' decisions to proceed with enrollment and their initial institutional perceptions (Sugandi et al., 2025; Acharya, 2025; Thalib et al., 2022; Huang et al., 2023). The measurement of satisfaction and perceived effectiveness of early academic services also requires strong psychometric foundations, as these constructs are frequently used as indicators of service quality and institutional image (Sugandi et al., 2025; Amalia & Zuraidah, 2022; Bunawolo et al., 2024; Uska et al., 2020; Hamonangan, 2023; Kanwar & Sanjeeva, 2022; Del Carmen Olmos-Gómez et al., 2023; Rasheed & Rashid, 2023; Gonzales et al., 2025; Huang et al., 2023).

Based on this review, two specific research gaps emerge. First, there is a lack of integrated instruments measuring admission system quality, application intention, prospective student satisfaction, and perceived effectiveness of initial academic services within the Indonesian postgraduate education context. Second, many studies have not reported construct validity through exploratory and confirmatory factor analyses nor examined cross-group measurement invariance, leaving the stability of instrument structures insufficiently verified.

The novelty of this study lies in both theoretical and methodological contributions. Theoretically, the study integrates the information systems success model with psychological and service perception constructs in the context of student admissions, resulting in a conceptual framework linking admission system quality with application intention, satisfaction, and perceived effectiveness of early academic services. Methodologically, the study offers a systematic instrument development and validation procedure involving theory-driven item generation, expert-based content validation, pilot testing, and planned exploratory and confirmatory factor analyses for subsequent validation stages.

Accordingly, this study aims to develop and evaluate the validity and reliability of an instrument measuring four key constructs in the new student admission context: admission system quality, application intention, prospective student satisfaction, and perceived effectiveness of initial academic services. The validation process is conducted progressively through content validity assessment, pilot testing, Classical Test Theory–based validity analysis, and planned construct validation using exploratory and confirmatory factor analyses

with larger samples. This approach is expected to produce an instrument with strong psychometric properties that can serve as a foundation for evidence-based evaluation of new student admission services.

Method

This study employed an initial instrument validation design in the form of a pilot study using a quantitative approach grounded in Classical Test Theory (CTT). The primary objective was to evaluate the preliminary psychometric properties of the instrument through item validity and internal reliability testing rather than examining causal relationships among variables. The instrument was developed to measure four constructs within the context of new student admission services, namely admission system quality, intention to enroll, prospective student satisfaction, and perceived effectiveness of initial academic services.

The study population consisted of prospective postgraduate students in the odd semester who had participated in or were undergoing the admission process. A census sampling technique was applied because the population was limited and fully accessible, allowing all members to be included as research respondents. A total of 34 respondents participated in the study. Participants represented diverse academic programs, were within an adult age range, and had direct experience using the admission system. This sample size was considered adequate for preliminary instrument testing based on CTT but insufficient for factor analysis; therefore, the findings are positioned as initial psychometric evidence with limited generalizability.

Instrument development followed a systematic procedure beginning with construct and indicator identification based on theoretical review. The admission system quality construct encompassed ease of use, reliability, information clarity, security, and system interface. The intention to enroll construct included continuation intention, institutional preference, and motivation to select a study program. The prospective student satisfaction construct covered expectation confirmation, process comfort, and evaluation of registration experience, while perceived effectiveness of initial academic services included process efficiency, service responsiveness, and early academic support. These indicators were derived from the information systems success model as well as literature on behavioral intention, user satisfaction, and higher education service quality. The instrument consisted of 88 items measured on a five-point Likert scale ranging from strongly disagree to strongly agree. To reduce common method bias, items were written with varied wording, including several negatively keyed statements. Sample items addressed perceived ease of understanding the registration system, intention to continue the admission process,

satisfaction with registration experience, and perceptions of institutional support during the initial service stage.

Content validity was assessed through expert review, in which specialists evaluated each item for relevance to the construct and indicators, clarity of wording, and adequacy of indicator representation, following recommended procedures for content validity evaluation (Almanasreh et al., 2019; Fernández-Gómez et al., 2020; Terwee et al., 2018; Mokkink et al., 2025; Polit et al., 2007; Yusoff, 2019; Alexandre & Coluci, 2011). Expert feedback informed item revision prior to empirical testing, while descriptive indices such as Aiken's V or the Content Validity Index were used as preliminary evidence of content validity. Data collection was conducted after completion of the odd semester admission cycle using an online questionnaire distributed to all respondents. Participants received information regarding the study purpose and provided informed consent before completing the questionnaire, and only complete responses were included in the analysis.

Empirical validity was examined using corrected item–total correlation. Items were considered valid if they met the minimum threshold of 0.30, indicating meaningful contribution to construct consistency within the CTT framework, with the critical r-value used as an additional reference based on sample size. Internal reliability was assessed using Cronbach's Alpha for both the overall instrument and each construct. Cronbach's Alpha was selected due to its suitability for pilot studies with limited sample sizes, whereas advanced reliability analysis such as McDonald's Omega is planned for future studies involving larger samples.

Given the sample size of 34 respondents, exploratory and confirmatory factor analyses were not conducted in the present study. Consequently, construct validity evidence remains preliminary and requires further examination. Future research is planned to involve larger samples to enable Exploratory Factor Analysis and Confirmatory Factor Analysis for comprehensive evaluation of the instrument's factor structure.

Data analysis was performed using SPSS through sequential procedures including data screening, descriptive statistics, CTT-based item validity testing, and internal reliability assessment. The study adhered to research ethics principles, with voluntary participation obtained through informed consent, respondent anonymity maintained, and data used exclusively for research purposes. Institutional approval was obtained in accordance with applicable procedures, and findings are reported in aggregate form without disclosure of personal respondent information.

Result and Discussion

Result

Instrument validity testing was conducted using corrected item–total correlation across 88 items involving 34 prospective postgraduate students. This technique was selected to obtain a more conservative estimate of item validity because the total score excludes the item under evaluation. The corrected item–total correlation values were treated as empirical correlation coefficients and compared with the critical value of 0.339 at a 5% significance level with 32 degrees of freedom. The analysis indicated that all items exceeded the minimum threshold, with correlation values ranging from 0.503 to 0.901. These findings suggest that each item contributed adequately to the construct being measured and that no items were eliminated during the initial validation stage.

Psychometric testing of the pilot data aimed to assess item quality and internal consistency of the instrument measuring four main constructs, namely admission system quality, intention to enroll, prospective student satisfaction, and perceived effectiveness of initial academic services. Item validity analysis demonstrated that all 88 items surpassed the minimum criterion of 0.30, indicating their adequacy in representing the intended constructs. The range of item correlations fell within moderate to very strong categories, reflecting meaningful contributions of each item to the overall construct score. Reliability testing using Cronbach's Alpha revealed very high internal consistency both at the construct level and for the total instrument, indicating measurement stability during the pilot stage.

To clarify the psychometric characteristics of the instrument, the results are summarized in Table 1.

Table 1. Summary of psychometric characteristics of the instrument

Construct	Main dimensions	Number of items	CITC range	Cronbach's α
Admission system quality	System quality, information quality, service quality	27	0.41–0.86	0.981
Intention to enroll	Information quality, transparency, efficiency, accessibility	25	0.39–0.84	0.978
Prospective student satisfaction	Service satisfaction, academic satisfaction	18	0.43–0.88	0.975
Perceived effectiveness of initial academic services	Academic process efficiency, academic support quality	18	0.45–0.87	0.976
Total instrument	—	88	0.39–0.88	0.992

Note: The CITC range reflects item–total analysis results showing that all items exceeded the minimum threshold of 0.30.

The overall reliability coefficient of 0.992 indicates extremely high internal consistency and suggests strong inter-item relationships within the instrument. Nevertheless, such a high coefficient may also reflect potential item redundancy, particularly in instruments with a large

number of items. Accordingly, this finding is interpreted as evidence of measurement stability at the pilot stage with a limited sample while simultaneously highlighting the need for further construct analysis to identify possible item reduction without compromising conceptual coverage. Additional inspection using the alpha-if-item-deleted procedure showed no meaningful increase in reliability when individual items were removed, suggesting that all items contributed to construct measurement despite potential content overlap among some statements.

Descriptive statistics of the constructs revealed relatively stable score distributions with adequate response variability across all constructs. Mean scores were generally high with moderate standard deviations and no indication of extreme distributional deviations. This pattern suggests that the instrument was capable of capturing perceptual variation among respondents even within the limited pilot sample.

The findings should be interpreted in light of several methodological limitations. The relatively small pilot sample constrains the stability of psychometric parameter estimates and precludes comprehensive testing of the factor structure. The use of Classical Test Theory at this stage evaluates internal item quality but does not explicitly assess construct dimensionality. Furthermore, reliance on self-report data collected at a single time point may introduce common method bias, although variation in item wording was implemented as an initial mitigation strategy. The extremely high reliability coefficient also indicates potential item redundancy, underscoring the importance of exploratory factor analysis to identify latent structure and opportunities for instrument refinement. Overall, the results demonstrate satisfactory preliminary psychometric quality based on item validity and internal reliability; however, these findings should be considered provisional due to the limited sample size. Future research is recommended to involve larger and more diverse samples to enable Exploratory Factor Analysis and Confirmatory Factor Analysis, cross-group invariance testing, and alternative reliability estimation such as McDonald’s omega, thereby allowing comprehensive verification of the instrument’s factor structure and improved measurement efficiency.

Discussion

Reliability testing indicated that the research instrument demonstrated extremely high internal consistency, with a Cronbach’s Alpha coefficient of 0.992. This finding suggests that all questionnaire items consistently and stably measured the intended constructs. With this level of reliability, the instrument can be considered appropriate for assessing the quality of the new student admission system and its associations with intention to enroll, prospective student satisfaction, and perceived effectiveness of academic services. Methodologically,

this result supports the study's initial assumption that the developed instrument aligns with the stated objectives and conceptual framework.

These findings are consistent with prior research emphasizing the importance of clearly defined and conceptually relevant indicators in perception-based instruments, particularly within educational service contexts. Previous studies have reported that instruments with coherent and well-articulated indicators tend to produce high reliability coefficients. In this regard, the extremely high reliability observed in the present study not only corroborates earlier findings but also suggests that the instrument exhibits comparatively strong measurement quality relative to many similar studies.

The argument regarding clearly defined indicators and high reliability in perception-based instruments is theoretically consistent with established psychometric literature. Research shows that instruments whose items are closely aligned with well-specified constructs tend to demonstrate stronger internal consistency because each item contributes meaningfully to the same latent dimension. Studies on educational quality and learning environment measurement confirm that conceptually coherent indicators and strong factor loadings are associated with high reliability coefficients in student perception instruments (Mousavi et al., 2020; Hoang et al., 2023; Van Der Scheer et al., 2018; Yaw & Agani, 2023). For instance, the EEAM and V-DREEM instruments report Cronbach's alpha values around 0.94–0.95, supported by clear construct definitions and rigorous content validation processes (Mousavi et al., 2020; Hoang et al., 2023).

Instruments designed to assess perceptions within educational service contexts also demonstrate similar patterns. Measures capturing students' views on teaching quality, learning environments, and institutional services frequently yield high reliability when items are context-specific and conceptually integrated (Hoang et al., 2023; Mousavi et al., 2020; Van Der Scheer et al., 2018; Yaw & Agani, 2023). Parallel findings are reported in studies examining virtual education quality and e-learning environments, where strong psychometric performance is attributed to clearly formulated indicators reflecting users' experiences and expectations (Mahmoudi & Jouybari, 2025; Mousavi et al., 2020; Martin et al., 2020).

When compared with similar instruments, reliability coefficients in student perception measures typically fall within the range of 0.80–0.95. Values at the upper end of this spectrum are commonly interpreted as evidence of strong internal consistency, particularly when supported by additional validity evidence such as content and construct validation (Hoang et al., 2023; Alfiyah et al., 2025; Mousavi et al., 2020; Camacho-Tamayo & Bernal-Ballén, 2023; Yaw & Agani, 2023; Taber, 2017). These benchmarks indicate that perception-based instruments can achieve robust measurement quality when their indicators are

theoretically grounded, empirically validated, and carefully aligned with the intended constructs.

Illustrative examples reinforce this pattern. The V-DREEM instrument developed for nursing students in Vietnam reports an overall alpha of 0.955 based on 50 items organized into five coherent subscales (Hoang et al., 2023). Similarly, the EEAM scale assessing e-learning atmosphere demonstrates an alpha of 0.943 across 40 items representing six clearly defined factors (Mousavi et al., 2020). A teaching self-perception instrument using a STEAM approach achieved an alpha of 0.920 following expert evaluation confirming item clarity and conceptual coherence (Camacho-Tamayo & Bernal-Ballén, 2023), while a measure of further mathematics classroom experiences reported an alpha of 0.806 across 26 items and four factors (Yaw & Agani, 2023). Collectively, these examples highlight that high reliability in perception-based educational instruments is typically associated with strong conceptual alignment, validated indicator structures, and contextually relevant item development.

From a theoretical perspective, the results reinforce the understanding that the quality of educational service systems, especially during the early interaction between prospective students and institutions, can be measured consistently through well-structured instruments. The instrument therefore contributes to the development of measurement tools in educational management and academic service research. Practically, the availability of a reliable instrument provides direct benefits for educational administrators as an evaluative tool for assessing admission system performance. The resulting data may inform decision-making processes, service improvement initiatives, and strategies aimed at enhancing prospective student satisfaction.

The very high reliability coefficient may be attributed to several factors. Strong conceptual relationships among indicators likely enabled items to collectively capture the primary constructs. Additionally, the relatively homogeneous characteristics of respondents, consisting of prospective students within the same academic level, may have contributed to response consistency. Clear item wording and alignment with respondents' experiences also likely minimized interpretative discrepancies, thereby producing stable response patterns.

The reliability results directly support the study's objective of developing an instrument capable of reliably examining the influence of admission system quality on intention to enroll, satisfaction, and perceived effectiveness of academic services. With a highly reliable instrument, analyses of relationships among variables can be conducted with greater confidence, strengthening the credibility and scientific rigor of the study's conclusions.

Nevertheless, several limitations should be acknowledged. The relatively small number of respondents may restrict the generalizability of the findings. Furthermore, the extremely high reliability coefficient may indicate potential item similarity, suggesting that certain aspects of construct variability may not yet be fully captured. These limitations do not diminish the value of the findings but should be considered when interpreting the results.

Based on these findings and limitations, future research is recommended to test the instrument with larger samples and across diverse institutional contexts. Additional validation procedures, such as Exploratory Factor Analysis and Confirmatory Factor Analysis, are also necessary to further verify the construct structure and dimensionality of the instrument. With continued refinement, the instrument is expected to demonstrate not only high reliability but also enhanced representativeness in comprehensively measuring the quality of new student admission systems.

Conclucion

The findings indicate that the developed instrument demonstrates preliminary empirical validity based on corrected item–total correlation analysis of 88 items using a pilot sample of 34 prospective postgraduate students. All items exceeded the minimum correlation threshold, resulting in no item removal at this stage. Reliability testing further produced a total Cronbach's Alpha of 0.992, reflecting very high internal consistency within the pilot sample. These results suggest that the instrument shows adequate initial measurement stability for representing the constructs of admission system quality, intention to enroll, prospective student satisfaction, and perceived effectiveness of early academic services.

Methodologically, this study provides an initial contribution to the development of perception-based measurement instruments within the context of new student admission services. The preliminary validation results indicate that indicators derived from the conceptual framework were capable of producing consistent measurements during the limited pilot testing phase. However, these findings should not be interpreted as comprehensive evidence of construct validity but rather as an early stage in instrument development that requires further psychometric evaluation. From a practical perspective, the instrument may be used exploratorily by institutions as a preliminary mapping tool to assess prospective student perceptions of admission system quality and identify service aspects requiring improvement.

Several limitations should be acknowledged in interpreting the conclusions. The small pilot sample drawn from a single institutional context restricts the stability of psychometric parameter estimation and limits generalizability. In addition, the extremely high reliability coefficient should be interpreted cautiously, as it may reflect potential item similarity.

Accordingly, the conclusions are confined to evidence of preliminary empirical validity and high internal reliability within the pilot sample context.

Future research should focus on strengthening the instrument's psychometric evidence through several key steps. These include further content validation through expert judgment, examination of factor structure using Exploratory Factor Analysis and Confirmatory Factor Analysis, assessment of temporal stability through test–retest reliability, and testing across larger and more diverse multi-institutional samples. Such efforts are expected to enhance construct validity, improve item efficiency, and ensure broader generalizability, thereby enabling the instrument to be used more widely in evaluating the quality of new student admission systems.

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