# The Construction of Evaluation Index System of Full-Time Professional Degree Graduate Education Based on SERVQUAL

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## Abstract

This study examines the service quality of full-time professional degree graduate education, grounded in its distinct characteristics. By synthesizing extensive domestic and international research on higher education service quality evaluations, theoretical insights into the service quality of full-time professional degree graduate education, and the multi-dimensional SERVQUAL model, this paper identifies the primary determinants of service quality through expert interviews and corroborates these findings with empirical survey data. The identified factors include interaction, credibility, value, assurance, empathy, and brand image. The overarching aim of this research is to enhance service quality from the student perspective and to safeguard the integrity of full-time professional degree graduate training programs.

## 1. Introduction

With the ongoing evolution of society and the profound shifts in the talent market's demand structure, the need for professional degree postgraduates across various industries has surged. Professional degree postgraduate education has thus emerged as the primary conduit for training high-level applied professionals. To enhance the role of professional degree education in this new context and to address the prevailing emphasis on academic degrees over professional degrees in China's graduate enrollment and training, the Ministry of Education launched the

Professional Degree Postgraduate Education Program (2020-2025) in 2020. This initiative explicitly aims to expand the enrollment scale of professional master's degree students to approximately two-thirds of the total graduate enrollment. Concurrently, it calls for accelerating the development and expanding the scale of doctoral postgraduate education (Wang et al., 2023). In 2023, the Ministry of Education further articulated its vision in the Opinions on Further Promoting the Classified Development of Academic and Professional Postgraduate Education. This document emphasizes the integrated and innovative development of academic and professional graduate education, striving to enhance the independent training quality of top innovators and to establish a high-quality graduate education system (Liu, 2024). As an increasing number of full-time postgraduates enter the workforce, the quality of their training and their ability to meet the market's demand for "high-level applied talents" warrant timely follow-up and evaluation. Enhancing the quality of full-time professional degree postgraduate education is therefore of paramount importance. Moreover, the evaluation of graduate education serves as a crucial benchmark for the development of a high-quality graduate education system.

In the contemporary era, the discourse on quality management in professional degree graduate education has garnered significant attention within the academic and professional spheres. However, due to path dependency on traditional governance models and the absence of robust theoretical frameworks, the quality evaluation of professional degree graduate education predominantly relies on assessments conducted by government bodies, educational management departments, third-party evaluation institutions, and internal university evaluations. Meanwhile, students, who are the primary recipients of educational services, are often overlooked in the evaluation process despite their unique capacity to provide valuable feedback on the quality and effectiveness of their education. Consequently, the potential for "evaluation synergy" remains underutilized, and the efficacy of governance mechanisms requires enhancement. To address this gap, this study centers on full-time professional degree postgraduates, collecting their perceptions of educational quality. Leveraging the SERVQUAL service quality model, which is grounded in service quality perception theory, this research constructs a comprehensive and scientifically sound evaluation system for the quality of full-time professional degree postgraduate education.

## 2. The Present Situation of Research

Full-time professional degree graduate programs were established and began enrolling students in 2009. However, most existing studies focus on descriptive applications of SERVQUAL rather than critically engaging with broader theoretical discourses on education quality. The present study seeks to contribute by situating the SERVQUAL model within the evolving context of stakeholder theory and higher education accountability, highlighting the importance of aligning quality evaluation mechanisms with educational governance reforms (Coulthard, 2004).

They developed the Service Quality Gap Model to assess customers' perceptions of service quality within service and retail organizations. Building on this foundation, foreign scholars have further developed and researched higher education service quality evaluation systems based on the SERVQUAL model, applying it to the field of higher education. For instance, MAO' Neill conducted a study on students' perceptions of service quality in an Australian high school through performance analysis. The study emphasized the practical application value of evaluation work, identifying "responsiveness," "empathy," and "tangibility" as integral components of overall quality perception (O'Neill & Palmer, 2004). Voss R. et al. employed step-by-step empirical research to construct a perceived evaluation scale of higher education service quality from the perspective of students' potential desires (Voss et al., 2007). Anwowie S. measured the service quality of higher education using the service quality scale to quantify the gap between expectations and perceptions (Anwowie et al., 2015). Lupo addressed the inherent uncertainty in service quality, analyzing and evaluating the teaching service quality of Palermo University by combining the SERVQUAL theoretical model with fuzzy set theory and the analytic hierarchy process (Lupo, 2013). Czajkowska et al. explored the vague, subjective, and multifaceted nature of service quality by employing both the SERVQUAL and SERVPERF models to assess teaching service quality. Their study compared the evaluation results obtained from these two methods, demonstrating that the outcomes of teaching service quality assessments may vary depending on the chosen approach (Czajkowska & Manuela, 2021).

In recent years, domestic scholars have increasingly focused on the perception and evaluation of higher education service quality, yielding notable research outcomes. Bingxin Yan developed a higher education service quality evaluation model based on the SERVQUAL framework and provided a multi-stakeholder measurement scale encompassing teachers, students, enterprises, and families (Teeroovengadum et al., 2019). Tianzuo Yu et al. designed a questionnaire grounded in the SERVQUAL model to identify factors influencing graduate education service quality and constructed an IPA (Importance-Performance Analysis) diagram highlighting gaps in graduate education service quality (Khalaf & Khourshed, 2017). Zhengsong Zhou et al. analyzed graduate education quality assurance from the graduate students' perspective, using the SERVQUAL model to develop an evaluation system for graduate education quality (Parasuraman et al., 1988). Wenxin Xu et al. examined the quality assurance system for full-time Master's degree programs in Physical Education by integrating the SERVQUAL model with interviews and questionnaire surveys (Parasuraman A, et al.). Tao Zeng applied the SERVQUAL model to assess the quality of higher tourism education services in Macao universities, comparing service quality perceptions among bachelor's, master's, and doctoral students in tourism education to enhance understanding of quality standards across different academic levels (Sultan & Wong, 2012). Chunjuan Zhai, through empirical research on a university, identified six key factors of higher education quality evaluation from the student perspective—

visibility, reliability, responsiveness, assurance, empathy, and practicality—and validated these factors through reliability and validity tests (Teeroovengadum et al., 2019).

Drawing on a comprehensive review of relevant research literature, both domestic and international studies have increasingly focused on the perceived service quality from the perspective of educational service recipients and direct stakeholders—students. However, given the diverse educational objectives across higher education target groups, including junior college students, undergraduates, and graduate students, as well as significant variations within the same academic level but different types, substantial differences exist in their expectations and requirements. For instance, the training objective for full-time professional degree programs is to cultivate high-level applied talents, which entails a distinct training process compared to that of academic graduate students. Therefore, the service quality required by graduate students from higher education institutions must vary accordingly, and the perception and evaluation systems for their educational quality should be differentiated to reflect these distinct needs and objectives.

## 3. Construction of the SERVQUAL Evaluation and Measurement Indicator System

### 3.1. Construction of the Measurement Index System

The SERVQUAL measurement model has been widely recognized for its efficacy in evaluating the quality of higher education services. In adapting the SERVQUAL model to the context of full-time professional degree education, this study retained its five foundational dimensions while adjusting specific items to reflect the dual academic and practical focus of such programs. These modifications align with Parasuraman's guidance on context-sensitive adjustments and preserve the conceptual integrity of the model. However, debates persist regarding the identification and definition of the constructive dimensions of higher education service characteristics. The model is typically constructed based on the five universally applicable measurement dimensions initially proposed by Parasuraman, Zeithaml, and Berry (PZB), three renowned professors from the University of Cambridge in the UK. Parasuraman has noted, "While SERVQUAL is universally applicable, certain questions should be modified during the questionnaire design phase to better suit specific contexts." He further emphasized, "The SERVQUAL scale provides a robust foundation for constructing service quality evaluations. When applied in specific contexts, relevant items may be appropriately adapted, but the integrity of the scale must be preserved" (Zeithaml et al., 1993).

Based on the PZB model and fully considering the characteristics of full-time professional degree postgraduate education, this study conducted interviews with eight experts in quality management and educational management from three universities within the province. An evaluation model was developed, incorporating factors such as value, responsiveness, tangibility, practicality, and assurance, to assess the service quality of full-time professional degree postgraduate educa-

tion. Through in-depth interviews, suggestions and opinions were collected from both faculty and graduate students, leading to the initial formation of an evaluation system comprising 18 measurement indicators across five factors: value (A1, A2, A3), responsiveness (B1, B2, B3), tangibility (C1, C2, C3, C4), practicality (D1, D2, D3, D4), and assurance (E1, E2, E3) (see Table 1). The study protocol involving volunteers was approved by the Ethics Committee of the Faculty of Medicine of Jiangsu University, and written informed consent was obtained (IRB number is JSDX20250225001).

**Table 1.** Evaluation index system for service quality of full-time professional degree postgraduate education.

| Primary Indicator | Secondary Measurement Indicator |
|---|---|
| value | A1. Disciplines keep up with academic frontiers and industry development trends. |
| | A2. Schools often organize high-level experts to carry out industry frontier reports. |
| | A3. School strives to improve the quality of course teaching and practical teaching. |
| responsiveness | B1. Tutors (out-of-school mentors) often communicate with students. |
| | B2. The school (base) has an active reward policy. |
| | B3. Students' difficulties can be solved in the study and practice of the base. |
| tangibility | C1. Modernization of teaching buildings and laboratories. |
| | C2. Library and database are easy to use. |
| | C3. The campus environment is clean and beautiful. |
| | C4. The study and living space is comfortable and functional. |
| practicality | D1. The curriculum is guided by industrial demand and implements the integration of industry and education. |
| | D2. The school provides opportunities for internship, training and project work. |
| | D3. The course adopts inquiry teaching methods such as case teaching. |
| | D4. The school has relevant skills training and career development guidance. |
| | D5. Education service provides personalized professional practice support. |
| assurance | E1. The school pays attention to the protection of students' rights and interests. |
| | E2. Mentors (out-of-school mentors) have plenty of time for guidance. |
| | E3. Mentors (out-of-school mentors) have practical experience in product research and development, engineering projects and the transformation of scientific and technological achievements. |

## 3.2. Data Collection

The satisfaction of graduate students with the education provided, as well as their potential needs, will influence their actual perception of current higher education services. This perception is subsequently analyzed and compared with their expectations, yielding different psychological responses. The discrepancy between respondents' perceived importance of service quality and their actual experiences determines their level of satisfaction. Based on the indicators in the evaluation system, respondents provide a fundamental assessment of their satisfaction with

the quality of educational services, which is termed the "actual perceived value." The measurement employs a Likert 7-point scale, where respondents rate each evaluation indicator on a scale from 1 to 7, with 1 representing the lowest and 7 the highest level of satisfaction. A questionnaire was scientifically designed in accordance with the evaluation index system and used to collect data from three universities within the province (including one key university directly under the Ministry of Education and two provincial comprehensive universities). The questionnaire items were developed based on expert consultation and existing validated instruments. To enhance content validity, a pilot test involving 30 graduate students was conducted to refine the language and clarity of the items. Experts in education evaluation and psychometrics were consulted to ensure comprehensive coverage and face validity. A total of 338 questionnaires were distributed, and ultimately, 300 valid questionnaires were obtained.

### 3.3. Reliability and Validity Test

1) Reliability test

In this study, Cronbach's α coefficient was employed to assess the reliability of the formal questionnaire (Table 2). The overall Cronbach's α coefficient for the evaluation scale of full-time professional degree education service quality was 0.935, while the Cronbach's α coefficients for each sub-dimension of the scale exceeded 0.7. These results indicate that the questionnaire exhibits strong overall reliability and a high degree of internal consistency, thereby meeting the established standards for reliability testing.

**Table 2.** Cronbach's α coefficients for each dimension.

| dimension | Number of Items | Cronbach's α coefficients |
|---|---|---|
| value | 3 | 0.741 |
| responsiveness | 3 | 0.785 |
| tangibility | 4 | 0.890 |
| Practicality | 5 | 0.883 |
| assurance | 3 | 0.776 |
| Scale | 18 | 0.935 |

2) Validity test

Following the organization of data from valid questionnaires, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity were conducted. The results indicated a KMO value of 0.875 and a significance level for Bartlett's Test of Sphericity of 0.000 ($p < 0.001$), suggesting that factor analysis is appropriate. In measurement science, the contribution of common factors to the total variance is often used to assess the construct validity of measurement instruments. In this study, exploratory factor analysis (EFA) was performed using SPSS on 18 measurement indicators, resulting in the extraction

of five factors with a cumulative variance contribution rate of 77.76%. All 18 measurement indicators exhibited factor loadings within an acceptable range (see Table 3). These findings confirm that the overall scale aligns well with the original framework, thereby demonstrating good construct validity for the evaluation scale of service and education quality in full-time professional degree graduate programs.

**Table 3.** Factor analysis.

| | Composition | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| D1 | 0.822 | | | | |
| D2 | 0.707 | | | | |
| D3 | 0.633 | | | | |
| D4 | 0.841 | | | | |
| D5 | 0.794 | | | | |
| C1 | | 0.651 | | | |
| C2 | | 0.708 | | | |
| C3 | | 0.773 | | | |
| C4 | | 0.611 | | | |
| A1 | | | 0.691 | | |
| A2 | | | 0.600 | | |
| A3 | | | 0.708 | | |
| E1 | | | | 0.912 | |
| E2 | | | | 0.661 | |
| E3 | | | | 0.559 | |
| B1 | | | | | 0.738 |
| B2 | | | | | 0.534 |
| B3 | | | | | 0.691 |

## 4. Empirical Analysis and Conclusion

### 4.1. Questionnaire Design and Data Collection

Based on the previously established evaluation index system, a dual-column survey questionnaire was designed to assess both the expected quality and the actual perceived service quality of full-time professional graduate education. Each indicator utilized a 7-point Likert scale, ranging from 1 (lowest) to 7 (highest). A case study was conducted among full-time professional degree graduates who had completed their programs and were employed at a university in Jiangsu Province. While this case provides valuable localized insights, it also limits the generalizability of the findings. Future research should include a broader institutional sample to enhance the applicability of the results across contexts. A total of 180 ques-

tionnaires were distributed, and 165 valid responses were collected. While the results offer meaningful insights, it should be noted that the relatively small sample size may affect the statistical power of the analysis. Future studies should aim for larger, more diverse samples from multiple institutions to increase the reliability and representativeness of the findings.

## 4.2. Analysis of Perceived Expectation Gap

Drawing on the fundamental principles of the service quality gap model and the evaluative methodology of the SERVQUAL model, the expected quality of educational services for full-time professional degree graduate students is represented as E, while the actual perceived score is denoted as P. The service quality gap score Q is calculated by subtracting the expected score E from the perceived score P (i.e., $Q = P − E$). Utilizing this calculation method, the expected values, actual perceived values, and service quality gaps for each questionnaire item can be derived (see Table 4).

Based on the aforementioned data, the average values of expected and actual perceived service quality are primarily distributed between 5.9 and 6.7. This indicates that the educational service quality for full-time professional degree graduate students at this university has generally been acknowledged by the students. However, all service quality gaps are negative, suggesting that further improvements are necessary. The primary areas identified for enhancement include: implementing active scholarship and assistance policies at the university (or base); providing comfortable and functional learning and living spaces; offering opportunities for internships, practical training, and project-based work; emphasizing the protection of students' rights and interests; and delivering personalized support for professional practice through educational services. Among these, the largest gap is −0.71, indicating that full-time professional degree graduate students at this university have particularly high expectations regarding the university's emphasis on protecting students' rights and interests. In contrast, the service quality gaps for the university frequently organizing expert reports on industry frontiers and maintaining a clean and beautiful campus environment are relatively small. This suggests that these services have already met the expectations of full-time professional degree graduate students at this university to a significant extent.

## 4.3. IPA Analysis

Importance-Performance Analysis (IPA) is a tool utilized to evaluate and enhance the quality of services or products by identifying key areas for improvement through the assessment of various attributes' importance and performance. Integrating the SERVQUAL model with IPA analysis offers a valuable framework for examining the educational service quality for full-time professional degree graduate students and prioritizing targeted improvement strategies. By using expectations and actual perceptions as the horizontal and vertical axes, respectively, an IPA quadrant diagram is constructed to visualize the educational service quality

**Table 4.** Expected value and perceived value of each question and its gap.

| Question Items | Expected Value E | Actual Perceived Value P | Service Quality Gap Q |
|---|---|---|---|
| A1. Disciplines keep up with academic frontiers and industry development trends. | 6.56 | 6.17 | −0.39 |
| A2. Schools often organize high-level experts to carry out industry frontier reports. | 6.38 | 6.15 | −0.23 |
| A3. School strives to improve the quality of course teaching and practical teaching. | 6.61 | 6.19 | −0.42 |
| B1. Tutors (out-of-school mentors) often communicate with students. | 6.49 | 6.22 | −0.27 |
| B2. The school (base) has an active reward policy. | 6.65 | 6.04 | −0.61 |
| B3. Students' difficulties can be solved in the study and practice of the base. | 6.63 | 6.09 | −0.54 |
| C1. Modernization of teaching buildings and laboratories. | 6.52 | 6.10 | −0.42 |
| C2. Library and database are easy to use. | 6.64 | 6.29 | −0.35 |
| C3. The campus environment is clean and beautiful. | 6.42 | 6.22 | −0.2 |
| C4. The study and living space is comfortable and functional. | 6.59 | 5.99 | −0.6 |
| D1. The curriculum is guided by industrial demand and implements the integration of industry and education. | 6.63 | 6.13 | −0.5 |
| D2. The school provides opportunities for internship, training and project work. | 6.69 | 5.99 | −0.7 |
| D3. The course adopts inquiry teaching methods such as case teaching. | 6.53 | 6.10 | −0.43 |
| D4. The school has relevant skills training and career development guidance. | 6.53 | 6.08 | −0.45 |
| D5. Education service provides personalized professional practice support. | 6.62 | 6.06 | −0.56 |
| E1. The school pays attention to the protection of students' rights and interests. | 6.65 | 5.94 | −0.71 |
| E2. Mentors (out-of-school mentors) have plenty of time for guidance. | 6.55 | 6.15 | −0.4 |
| E3. Mentors (out-of-school mentors) have practical experience in product research and development, engineering projects and the transformation of scientific and technological achievements. | 6.56 | 6.21 | −0.35 |

for full-time professional degree graduate students (Figure 1). The average score of the expectation scale (6.57) and the average score of the actual perception scale (6.12) serve as the dividing points to delineate four distinct quadrants. The values of each measurement indicator for service quality are then mapped onto this matrix. Specifically, the top right quadrant is designated as Quadrant I, the "Strengths Area"; the top left quadrant as Quadrant II, the "Maintenance Area"; the bottom left quadrant as Quadrant III, the "Opportunity Area"; and the bottom right quadrant as Quadrant IV, the "Improvement Area."

The indicators located in the first quadrant (Strengths Area) reveal that full-time professional degree graduate students at the institution hold high expectations and report high actual perceptions across three key dimensions. This finding suggests that the institution's initiatives to enhance the quality of coursework and
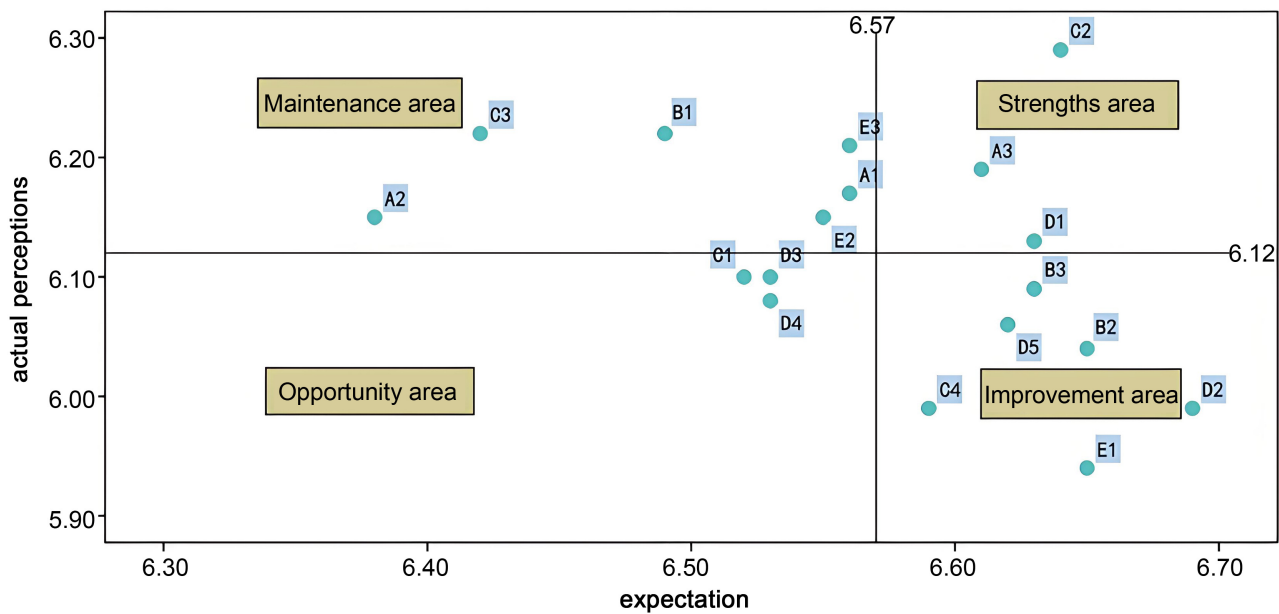
**Figure 1.** IPA quadrant diagram for educational service quality of full-time professional degree graduate students.

practical teaching, align curricula with industry demands, and promote industry-education integration have been positively recognized by the students. The high evaluations of these indicators reflect the institution's successful practices in improving educational quality and effectively meeting student needs. Students have clearly acknowledged and appreciated the institution's efforts in these areas.

The indicators in the second quadrant (Maintenance Area) reveal that full-time professional degree graduate students at the institution have relatively low expectations but high actual perceptions across six dimensions. This finding suggests that the institution's regular organization of high-level expert reports on industry frontiers, its clean and aesthetically pleasing campus environment, and other related factors have received favorable evaluations from students. These positive perceptions indicate that the institution has achieved notable success in its recent institutional and systemic reforms. Given this, the institution may consider conserving limited resources in these areas and defer further adjustments for the time being.

The indicators situated in the third quadrant (Area of Opportunity) reveal that full-time professional degree graduate students at the institution exhibit low expectations and actual perceptions across three dimensions. This suggests that students do not place significant importance on the modernization of teaching buildings and laboratory facilities, the implementation of inquiry-based teaching methods such as case studies in courses, or the availability of relevant skills training and career development guidance. Given this, it is unnecessary to devote excessive effort to these areas; instead, selective and targeted adjustments are recommended to optimize resource allocation and avoid inefficiencies.

The indicators in the fourth quadrant (Area for Improvement) reveal that full-time professional degree graduate students at the institution hold high expecta-

tions but report low actual perceptions across six dimensions. This highlights that areas such as the institution's active scholarship and assistance policies, as well as its emphasis on protecting students' rights and interests, require substantial improvement and enhancement. Addressing these gaps is essential for the institution to better align with student expectations, enhance student satisfaction and educational quality, and provide more effective support and guarantees for students' growth and development.

## 5. Conclusion

Drawing on the SERVQUAL service quality model and considering the unique characteristics of full-time professional degree graduate students, this study meticulously develops an educational quality evaluation system, with these students acting as the primary evaluators. The system undergoes rigorous validation and reliability testing, grounded in extensive survey data. Subsequently, the study diagnoses the gaps in educational service quality for full-time professional degree graduate students at a specific university. Utilizing Importance-Performance Analysis (IPA), the study conducts a quadrant analysis to identify key areas requiring improvement. The sample data were collected from full-time professional degree graduate students at representative universities across the province, ensuring that the constructed evaluation index system is both scientifically robust and practically applicable. Consequently, universities can employ this evaluation scale to assess the quality of education for full-time graduate students and implement targeted strategies to enhance service quality in critical areas.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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