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Evaluating the Perceived Quality of Educational Services Among Clinical Pathology Residents in Hasanuddin University Using the SERVQUAL Instrument

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ABSTRACT

The SERVQUAL instrument is widely used to assess service quality across various sectors; however, its application in specialist medical education remains limited. This study evaluated the educational service quality of the Clinical Pathology Specialist Programme at Hasanuddin University, Indonesia, from the residents' perspective using the SERVQUAL model. Out of 84 residents, 64 completed the standardised questionnaire measuring five service dimensions: reliability, assurance, tangibles, responsiveness, and empathy. All dimensions showed negative quality gap scores, indicating that the perceived service fell short of expectations. The largest gap was found in responsiveness, reflecting delays or insufficient support in addressing the residents' academic needs, whereas the smallest gap appeared in tangibles, suggesting relatively better satisfaction with facilities and staff appearance. The lowest- and highest-rated items were the availability of appropriate reading materials and the professional appearance of the staff, respectively. These findings highlight the need for targeted improvements, particularly in responsiveness and academic support. Persistent negative service gaps may undermine resident satisfaction, learning outcomes, and programme credibility. As postgraduate medical education shifts towards learner-centred, competency-based models, regular assessments using tools such as SERVQUAL are essential for guiding quality improvement, promoting institutional accountability, and supporting the development of competent clinical pathologists in Indonesia.

Keywords: *Educational service quality, Clinical pathologist resident, SERVQUAL instrument*

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INTRODUCTION

Educational service quality plays a pivotal role in shaping student satisfaction, academic achievement, and institutional reputation in higher education. Its significance is even greater in postgraduate medical education, as it directly influences the development of future specialists and, ultimately, the quality of their patient care. Residency training programmes–such as those in clinical pathology–represent complex educational systems that integrate academic instruction, clinical practice, mentorship, and resource support. Delivering consistently high-quality training in such settings is essential for producing competent, confident, and practice-ready physicians. To ensure and sustain a high level of quality, institutions must implement robust quality control systems that systematically compare expected educational standards with actual outcomes (1–3). In an increasingly competitive and accountability-driven academic environment, universities face mounting pressure to enhance these quality assurance mechanisms to uphold educational excellence and institutional credibility (4, 5).

Students, along with teaching and non-teaching staff, industry partners, and the broader community, are central stakeholders in the educational process (1, 6). In particular, students' perceptions and experiences offer critical insights into how effectively educational services are being delivered. Therefore, incorporating student feedback into ongoing quality monitoring is not only reasonable but also essential. This feedback loop allows institutions to identify gaps between expectations and actual experiences, enabling targeted improvements that align with learner needs and professional standards (1, 6, 7).

Service quality, by definition, reflects users' perceptions of how services are delivered, with satisfaction arising when delivery meets or exceeds expectations. In higher education, student satisfaction – how well services fulfil learners' expectations–is recognised as a core performance indicator (1, 8, 9). However, traditional evaluations in medical education have largely focused on academic performance and curricular content, often overlooking the service-related dimensions of postgraduate training. These dimensions include the responsiveness of teaching staff, the availability of learning resources, and infrastructure adequacy, as well as how effectively resident needs are supported. Such intangible yet crucial elements contribute substantially to overall learner satisfaction and professional development. This is especially true in specialist programmes such as clinical pathology, where training quality directly influences future clinical competence (1, 6, 9, 10). Despite their importance, systematic assessments of educational service quality in Indonesian postgraduate medical programmes remain scarce. Moreover, single-dimensional tools are insufficient for capturing the complex, multifaceted nature of service delivery in such settings (10).

The SERVQUAL instrument offers a standardised framework for assessing service quality across five key dimensions: reliability, assurance, tangibles, responsiveness, and empathy (8, 10–13). Although originally designed for the service industry, SERVQUAL has been widely

adapted in higher education, including health sciences. Studies on undergraduate and allied health programmes have consistently revealed negative gap scores, with perceived experiences falling short of expectations. Such findings have been reported in diverse international settings, including Saudi Arabia (14) and India (7), as well as in various meta-analyses (3, 15), underscoring the tool's global relevance.

Despite its broad use, SERVQUAL remains underutilised in postgraduate medical education, particularly in residency training. In Indonesia, standardised evaluations from the resident perspective are rare, despite residents occupying a dual role as learners and service providers. This makes them particularly sensitive to shortcomings in educational delivery, such as limited supervision, lack of resources, and administrative delays–factors that can compromise learning and patient care.

Thus, there is a pressing need for structured evaluation tools that can capture both the tangible and intangible aspects of training. SERVQUAL provides such a framework. This study applies SERVQUAL to assess educational service quality in the Clinical Pathology Residency Programme at Hasanuddin University, Indonesia, identifying gaps between residents' expectations and experiences to support targeted improvements in postgraduate training.

METHODOLOGY

This cross-sectional study was conducted from April to June 2023 in the Clinical Pathology Specialist Programme, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia. Using total population sampling, all students who met the inclusion criteria were recruited, yielding 64 active participants across various semesters and stages of training.

The SERVQUAL instrument, adapted for the Indonesian context, was employed to measure service quality across its five dimensions. All survey items were translated into Indonesian and tailored to the educational services offered by the Clinical Pathology Specialist Programme. A 27-item questionnaire was employed to measure both students' expectations (ideal conditions) and perceptions (actual experiences) on a 5-point Likert scale. Quality gaps were computed by subtracting expectation scores from perception scores. A negative gap shows that the service falls short of students' expectations, a positive gap means it exceeds them, and a gap of zero indicates no difference between the perceived quality and expectations.

The questionnaire was distributed via Google Forms to all students in the Clinical Pathology Study Programme–the target population for this study. Before completing the survey, each participant received a brief description of the study's background and objectives and signed informed consent forms. Regular reminders were issued to the participants until the submission deadline to maximise the response rate. Throughout the study, confidentiality and anonymity were strictly upheld: only the research assistant could access the raw Google Forms data, and any personally identifiable information was removed or replaced with unique codes before the data were shared with the principal investigator. However, the use of online questionnaire forms has several limitations, such as the potential for dishonest responses or participants providing inaccurate ratings. This may be considered one of the limitations of this study.

Reliability testing using Cronbach's alpha (average score: 0.91) and validity testing via Pearson correlation confirmed the instrument's robustness. Statistical analyses included descriptive statistics, the Kolmogorov–Smirnov test, and the paired *t*-test or the Mann–Whitney test, using IBM SPSS Statistics (version 27). The Kolmogorov–Smirnov test is used to analyse the normality of data distribution. The significance of the difference between expectations and perceptions is determined using a paired *t*-test if the data distribution test results are normal, whereas the Mann–Whitney test is employed if these results are abnormal.

RESULTS

Table 1 presents the demographic and academic characteristics of the study participants. Of the 84 active students in the Clinical Pathology Study Programme, 64 (76.2%) completed the questionnaire. Most of the respondents were female (85.9%), with a mean age of 33.5 years. Based on the three-stage specialist curriculum–basic (semesters 1–3), clinical (semesters 4–6), and application (semesters 7–8)–nearly half of the participants (48.4%) were in the basic stage, predominantly from the first semester.

Table 1: Subject characteristics

Characteristics		Frequency (n)	%
Gender	Male	9	14.1
	Female	55	85.9
Age	26–30 years old	13	20.3
	31–35 years old	29	45.3
	36–40 years old	22	34.4
Semester	First	12	18.8
	Second	8	12.5
	Third	11	17.2
	Fourth	5	7.8
	Fifth	12	18.8
	Sixth	8	12.5
	Seventh	4	6.3
	Eighth	4	6.3
Education level	Basic	31	48.4
	Clinical	25	39.1
	Application	8	12.5

Table 2 summarises the mean expectation and perception scores for each SERVQUAL item, in addition to the corresponding quality gaps and *p*-values.

Table 2: Average score for expectation and perception in each service quality item and its quality gap with *p*-value

Service dimension	Item	Expectation	Perception	Quality gap	*p*-value*
Reliability	The provision of educational content is given regularly and is relevant.	4.22 ± 0.68	3.91 ± 0.77	−0.31 ± 0.89	0.018
	Informing students about exam results.	4.28 ± 0.58	4.05 ± 0.65	−0.2 ± 0.75	0.045
	The provision of easily understandable educational content.	4.30 ± 0.71	3.95 ± 0.72	−0.34 ± 0.76	0.004
	Higher grades are obtained when students put in more effort.	4.34 ± 0.57	4.19 ± 0.56	−0.16 ± 0.65	0.116
	Recording educational documents without errors.	4.19 ± 0.56	3.89 ± 0.69	−0.30 ± 0.81	0.013
	Accessibility of learning resources easily in institutions.	4.27 ± 0.76	4.02 ± 0.72	−0.25 ± 0.73	0.033
	Timely fulfilment of responsibilities by lecturers and staff.	4.20 ± 0.74	4.03 ± 0.73	−0.17 ± 0.68	0.139
Assurance	Facilitating discussions and interactions in the classroom.	4.30 ± 0.61	4.14 ± 0.59	−0.16 ± 0.60	0.131
	Preparing student qualifications for future jobs.	4.36 ± 0.54	4.11 ± 0.67	−0.25± 0.69	0.035
	Accessibility of lecturers outside the classroom to answer students' questions.	4.34 ± 0.60	4.17 ± 0.61	−0.17 ± 0.63	0.108
	Accessibility to adequate references to enhance students' professional knowledge.	4.30 ± 0.65	3.92 ± 0.80	−0.37 ± 0.79	0.006
	The adequacy of the professional knowledge of lecturers.	4.39 ± 0.55	4.28 ± 0.58	−0.11 ± 0.47	0.293
Tangibles	The neat and professional appearance of lecturers and staff.	4.34 ± 0.51	4.36 ± 0.57	0.16 ± 0.38	0.767
	A display of comfortable and well-maintained physical facilities.	4.23 ± 0.50	4.16 ± 0.62	−0.08 ± 0.60	0.533
	Up-to-date educational equipment and teaching materials.	4.23 ± 0.68	4.03 ± 0.71	−0.20 ± 0.74	0.096
	The learning equipment appears to be well maintained.	4.23 ± 0.56	4.08 ± 0.67	−0.16 ± 0.69	0.210

(*Continued on next page*)

Table 2. (*continued*)

Service dimension	Item	Expectation	Perception	Quality gap	*p*-value*
Responsiveness	Accessibility of lecturers when students need it.	4.34 ± 0.60	4.05 ± 0.65	−0.30 ± 0.63	0.010
	Easy access for students to the management to express their views on the curriculum.	4.20 ± 0.62	3.97 ± 0.73	−0.23 ± 0.75	0.070
	Considering students' perspectives and suggestions in the curriculum.	4.20 ± 0.65	3.91 ± 0.73	−0.30 ± 0.77	0.020
	Introducing suitable references for student reading materials.	4.25 ± 0.59	3.92 ± 0.72	−0.33 ± 0.69	0.009
	Setting specific hours for student consultations regarding educational issues.	4.11 ± 0.74	3.97 ± 0.73	−0.14 ± 0.83	0.203
Empathy	Assignments that are appropriate and relevant.	4.22 ± 0.58	4.08 ± 0.60	−0.14 ± 0.69	0.185
	Flexibility of lecturers in addressing the specific conditions of each student.	4.25 ± 0.56	4.06 ± 0.59	−0.19 ± 0.61	0.052
	Comfortable class hours.	4.20 ± 0.72	3.89 ± 0.84	−0.31 ± 0.81	0.016
	Provision of a comfortable and quiet space in the programme for studying.	4.33 ± 0.51	4.13 ± 0.55	−0.20 ± 0.62	0.040
	Respectful treatment of students by staff.	4.23 ± 0.64	4.05 ± 0.72	−0.19 ± 0.91	0.151
	Respectful treatment of students by lecturers.	4.38 ± 0.52	4.27 ± 0.51	−0.11 ± 0.47	0.237

Note: *Significance level of $p < 0.05$

Reliability

The largest gap (-0.34) was in the clarity of educational content, whereas the smallest gap (-0.16) concerned awarding higher grades for extra effort.

Assurance

Limited access to up-to-date references showed the greatest gap (-0.37). The smallest gap (-0.11) was in the adequacy of lecturers' professional knowledge.

Tangibles

Outdated equipment and teaching materials exhibited the largest gap (-0.20). Notably, the neat, professional appearance of the staff was rated positively (+0.16); this was the only positively rated item among the five assessed dimensions. This indicates that one of the strengths of the study programme lies in the professional appearance of its staff.

Responsiveness

Providing suitable reading references showed the largest gap (-0.33). In contrast, the smallest gap (-0.14) pertained to scheduling specific consultation hours.

Empathy

Inconvenient lecture times generated the greatest gap (-0.31), whereas respectful treatment by lecturers showed the smallest gap (-0.11).

Table 3 consolidates these results by dimension. Students considered every dimension highly important (overall expectation mean = 4.27). Their perceptions averaged above 4.0 in all but the responsiveness dimension (mean = 3.96), yielding an overall perception mean of 4.06. All dimensions exhibited negative gaps, ranging from -0.10 (tangibles) to -0.26 (responsiveness). Furthermore, Mann–Whitney tests revealed that these gaps were statistically significant across all dimensions except tangibles ($p = 0.304$), with the assurance dimension showing the strongest significance ($p = 0.015$).

Table 3: Analysis of educational service quality in each dimension

Service dimension	Expectation	Perception	Gap quality	Mann–Whitney test (Z)	*p*-value*
Reliability	4.26 ± 0.50	4.00 ± 0.59	−0.25 ± 0.57	−2.344	0.019
Assurance	4.34 ± 0.51	4.12 ± 0.55	−0.21 ± 0.50	−2.432	0.015
Tangibles	4.26 ± 0.48	4.16 ± 0.55	−0.10 ± 0.48	−1.029	0.304
Responsiveness	4.22 ± 0.56	3.9 6± 0.65	−0.26 ± 0.64	−2.246	0.025
Empathy	4.27 ± 0.49	4.08 ± 0.52	−0.19 ± 0.56	−2.017	0.044

Note: *Significance level of $p < 0.05$

DISCUSSION

The SERVQUAL instrument is a framework for assessing service quality across five dimensions: reliability, assurance, tangibles, responsiveness, and empathy. It offers insights into how educational institutions deliver services and how students, as the primary consumers, perceive them. Reliability evaluates the accuracy and consistency of educational services, ensuring curriculum relevance concerning current medical practices and consistent teaching across lecturers and subjects. Assurance measures the competence and credibility of the teaching staff, emphasising the need for qualified instructors, student confidence, and adherence to professionalism and ethics. Tangibles focus on physical facilities, equipment, and staff appearance; they include classrooms, laboratories, and libraries, as well as access to necessary learning technologies. Responsiveness assesses institutions' willingness to assist students effectively, such as by providing prompt responses to inquiries, resolving administrative issues, and adapting the curriculum based on feedback. Empathy concerns understanding students' unique needs, offering personalised support, and fostering a caring and supportive learning environment (7, 16).

Using SERVQUAL in medical education helps institutions identify their strengths and weaknesses, enabling targeted improvements to enhance the student experience and better prepare future healthcare professionals. By focusing on specific service dimensions,

institutions can meet stakeholder expectations while prioritising areas that require immediate attention without neglecting overall service quality improvements (16, 17).

In this study, in the reliability dimension, the students gave the highest perception score to 'awarding higher grades for extra effort' (4.19) and the lowest to 'error-free documentation of educational records' (3.89). The largest reliability gap concerned the clarity of educational content (-0.34). These results differ from those of Moosavi et al. (10) who reported the lowest score for easily understood material (2.79), the highest score for flawless documentation (3.07), and the greatest gap in limited access to learning references (-1.67). Such discrepancies highlight how students' perceptions vary across institutions, reflecting unique strengths and weaknesses. The current study's findings emphasise two priorities for improvement: establishing accurate record-keeping and ensuring that course materials are presented in a readily understandable manner (10). Addressing these issues will require formal, standard operating procedures for archiving and documentation, staff training in good documentation practices, and workshops that equip lecturers with interactive teaching techniques to make course content more accessible.

In the assurance dimension, lecturers' professional competence received the highest score and recorded the smallest quality gap. In contrast, access to up-to-date learning resources received the lowest score and recorded the largest gap. Al-Rabia et al. (14) reported a similar trend, lecturers' expertise received the highest score (3.86), whereas 'preparing students for future employment' received the lowest score (3.20) and showed the greatest gap (-1.36). Together, these findings point to two pressing needs. First, expanding and modernising the programme's collection of books, journals, and instructional media are required to strengthen students' professional knowledge. Second, these resources should be aligned with the competencies required in the workforce so that graduates feel well prepared for future employment. Regularly updating and broadening the library should therefore be a priority (14).

The neat, professional appearance of lecturers and other staff earned the highest perception score in the tangibles dimension; notably, it was the only item with a positive quality gap. In contrast, the availability of up-to-date equipment and teaching materials recorded both the lowest perception score and the largest negative gap. Al-Rabia et al. (14) reported a similar pattern, students rated staff appearance most favourably (mean 4.05) and gave the lowest rating to 'comfortable, well-maintained facilities' (mean 3.20). These findings collectively highlight an urgent need to modernise and maintain educational equipment and learning resources. Many tools, such as microscopes, have been in service for years, and teaching materials often remain unrevised despite advances in the field (14). Therefore, the study programme should conduct regular audits of its equipment and systematically update course materials to keep pace with scientific progress and evolving student needs.

The highest perception score in the responsiveness dimension was for the accessibility of lecturers when students need assistance (4.05), whereas the lowest was for considering students' views and suggestions in curriculum development (3.91). The greatest gap was in introducing appropriate reading materials (-0.33). These findings imply that many lecturers do not consistently direct students to supplementary literature during class. To close this gap, the study programme should encourage all instructors to highlight key references in each lecture and practical session, followed by brief reminders. In addition, the programme's library must keep the recommended titles well stocked so that students can readily access the suggested readings. Similar findings were reported by Aghamolaei and Zare (16). In their study, considering students' views in curriculum development had the lowest perception

score (2.40) and the highest quality gap (–1.51). These results suggest that involving students in curriculum development is a consistently weak area (16). Although the current policy mandates student involvement in both ongoing curriculum reviews and the creation of new courses, the low scores found in the current study suggest that their feedback continues to be underused. To address this gap, the study programme should regularly collect student input and systematically incorporate it whenever the curriculum is evaluated or revised.

In the empathy dimension, the students awarded the highest perception score to lecturers' respectful treatment (4.27), whereas 'comfortable lecture hours' received the lowest score (3.89) and showed the greatest gap (–0.31). Aghamolaei and Zare (16) reported a similar pattern, respectful treatment ranked the highest (3.56), whereas lecturers' flexibility in accommodating students' circumstances ranked the lowest (2.77) and showed the greatest gap (–1.27). Together, these findings highlight scheduling as a recurring source of dissatisfaction. In the Clinical Pathology Specialist Programme at Hasanuddin University, lectures often overrun their allotted times, division-cycle schedules are released only days before a new month begins, and general university courses occasionally conflict with clinical rotations. To strengthen empathy-related service quality, the programme should publish timetables well in advance, adhere strictly to scheduled hours, and coordinate course calendars to prevent overlaps; these steps would place greater emphasis on student convenience and, ultimately, boost satisfaction (16).

Despite these insights, this study has several limitations. First, it was conducted at a single institution, with a limited sample size of 64 participants. Future research involving larger samples and multiple centres for clinical pathology education across Indonesia is recommended for a more comprehensive evaluation of educational service quality. Second, as no specific SERVQUAL tool exists for the Clinical Pathology Study Programme at Hasanuddin University, the questionnaire used in this study was a modified version of the SERVQUAL instrument from previous international studies. Future studies should rigorously validate a version of SERVQUAL tailored to Indonesian medical education. This process could begin with item generation and content validation to refine statements that reflect local elements. Forward- and back-translation, followed by cognitive interviews, would ensure linguistic clarity and cultural relevance. The resulting draft could then be pilot tested with trainees from multiple medical schools. Subsequent exploratory and confirmatory factor analyses would confirm dimensionality and internal consistency, and additional metrics, such as Cronbach's alpha, composite reliability, and test–retest reliability, would further establish robustness. Third, this study employed a cross-sectional design, collecting responses from students at varying semester levels, which may have influenced the consistency of their assessments. Future research using a cohort design is recommended to reduce bias and provide more reliable insights into students' expectations and perceptions.

CONCLUSION

This research shows a negative gap in educational service quality across all dimensions, indicating that students' perceptions are lower than their initial expectations. To improve student satisfaction, institutions must enhance educational standards. The responsiveness dimension, with the largest negative gap, can be improved by encouraging all instructors to highlight key references in each lecture and practical session, followed by brief reminders. In addition, the programme's library must keep the recommended titles well stocked so that students can readily access the suggested readings.

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ETHICAL APPROVAL

This research has received ethical clearance from the Ethics Commission of Hasanuddin University, with the reference number: 257/UN4.6.4.5.31/PP36/2023.

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