

# INTEGRATING ADAPTED SERVQUAL AND STATISTICAL QUALITY TOOLS TO MONITOR UNIVERSITY ADMISSION SERVICES: EVIDENCE FROM USTP-BALUBAL

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**ABSTRACT-** *This cross-sectional descriptive-evaluative case study assessed admission service quality at the University of Science and Technology of Southern Philippines-Balubal Campus by integrating an adapted, perception-only SERVQUAL instrument with a diagnostic p-chart, fishbone analysis, and Pareto prioritization. Data from 92 applicants were analyzed using means, standard deviations, dissatisfaction proportions, and problem frequencies. The 25-item service-quality scale showed good internal consistency (Cronbach's alpha = 0.81), while the 15-item transaction scale was acceptable (alpha = 0.75). Overall perceived service quality was high (M = 3.78, SD = 0.13). Assurance (M = 4.16), empathy (M = 4.14), reliability (M = 4.03), and responsiveness (M = 3.97) were rated high, whereas tangibles was low (M = 2.57). Recalculation of the attribute chart produced a center line of 0.299, an upper control limit of 0.442, and a lower control limit of 0.155. Next-step information after submission (p = 0.457) and organized processing (p = 0.500) exceeded the upper limit, while guidance for incomplete requirements (p = 0.098) fell below the lower limit. Root-cause and priority analyses pointed to weak signage, unclear requirements, long waiting time, and difficulty locating transaction areas. The results support a focused improvement program involving standardized applicant guidance, visible and digital wayfinding, process redesign, response-time standards, and periodic quality monitoring. Because the indicators were cross-sectional and based on repeated responses from the same applicants, the p-chart is interpreted as a diagnostic screening tool rather than proof of longitudinal process control.*

**Keywords:** Admission Service Quality, Higher Education, P-Chart, Pareto Analysis, SERVQUAL, Statistical Quality Control

## 1. INTRODUCTION

Admission is a strategic frontline service because it forms one of the earliest official interactions between a higher education institution and prospective students. Applicants move through connected encounters involving information seeking, submission of credentials, document verification, application processing, and status follow-up. Weakness in any stage may affect perceptions of institutional reliability, accessibility, professionalism, and care. Evidence-based monitoring of these encounters is therefore important for institutional quality assurance, student-service improvement, and the design of applicant-centered processes.

Higher education service quality as a multidimensional management concern. Bibliometric evidence confirms the continuing use of SERVQUAL in higher education [1], while HEISQUAL and total-quality studies emphasize systematic assessment of academic and administrative services [2], [3]. Student satisfaction is also associated with perceived quality, institutional reputation, and related behavioral outcomes [4]-[6]. Significant links between service quality and student satisfaction [7], the contribution of service quality to student satisfaction and loyalty [8], the importance of evaluating student affairs and services [9], and the role of quality-assurance practices in tertiary institutions [10]. This supports the five-dimensional SERVQUAL structure for evaluating university students' satisfaction [11]. Beyond measurement, student-service research emphasizes the importance of organized support throughout the university experience [12].

However, broad university experiences or models the relationship between service quality and satisfaction. Fewer studies examine admission as a discrete service process and connect perception measures to diagnostic quality-control tools. Admission offices need not only an overall rating but also a way to identify where dissatisfaction is concentrated, organize plausible causes, and prioritize corrective action. This study addresses that operational gap by integrating an adapted SERVQUAL assessment with an attribute chart, a fishbone diagram, and a Pareto-based priority analysis.

The study had four objectives: (1) describe the applicants and their admission transactions; (2) assess perceived admission service quality across tangibles, reliability, responsiveness, assurance, and empathy; (3) identify transaction indicators with unusually high or low dissatisfaction proportions; and (4) develop a focused improvement plan from the combined statistical and root-cause findings.

## 2. METHODS

### 2.1 Research design and setting

A cross-sectional descriptive-evaluative case study was conducted at USTP-Balubal Campus. The descriptive component summarized applicant characteristics, perceived service quality, and reported service problems. The evaluative component used statistical and quality-improvement tools to screen dissatisfaction patterns and translate them into actionable priorities. The study did not test an intervention and did not establish causal effects.

The respondents were 92 applicants who had directly experienced at least one admission-related transaction during the selected data-gathering period. Purposive sampling was

used because the study required actual service users. The transaction groups were admission inquiry, submission of requirements, document verification, application processing, and admission status follow-up. All recorded transactions in the dataset were face-to-face.

## 2.2 Instrument and measurement quality

The researcher-made questionnaire contained four parts: respondent profile, a 25-item service-quality scale, a checklist of common service problems, and 15 transaction-specific indicators. The service-quality items were organized under the five commonly used SERVQUAL dimensions: tangibles, reliability, responsiveness, assurance, and empathy. This structure is consistent with higher education applications and reviews of SERVQUAL [1, 11, 13]. The instrument measured perceptions only and did not obtain paired expectation scores, it is described here as an adapted or SERVQUAL-informed scale rather than a full expectation-perception gap analysis.

Pilot testing produced a Cronbach's alpha of 0.81 for the 25-item service-quality scale and 0.75 for the 15-item transaction scale. For the present study, these coefficients were treated as evidence of adequate internal consistency for descriptive use. Three experts reviewed the content of both instruments. The source record stated that item-level content-validity agreement was generally achieved, but it did not report the complete item-level and scale-level indices; this omission is retained as a methodological limitation rather than replaced with estimated values.

## 2.3 Data analysis

Frequencies and percentages described the respondent profile. Means and standard deviations summarized the five service-quality dimensions. The five-point interpretation was: 4.21-5.00, very high; 3.41-4.20, high; 2.61-3.40, moderate; 1.81-2.60, low; and 1.00-1.80, very low.

For each transaction indicator, the dissatisfaction proportion was computed as  $p_i = d_i/n$ , where  $d_i$  was the number of dissatisfied responses and  $n = 92$ . The pooled proportion was  $\bar{p} = \sum d_i / \sum n_i$ . Three-sigma limits were calculated as  $UCL = \bar{p} + 3\sqrt{[\bar{p}(1-\bar{p})/n]}$  and  $LCL = \bar{p} - 3\sqrt{[\bar{p}(1-\bar{p})/n]}$ , truncated at zero when necessary. Recalculation from the published counts produced  $\bar{p} = 0.299$ ,  $UCL = 0.442$ , and  $LCL = 0.155$ . Control charts and related quality tools are commonly used to screen process variation and prioritize improvement [14]-[17]. The conventional statistical process control relies on comparable process observations, the present points, which represent indicators completed by overlapping respondents rather than independent time-ordered subgroups, are interpreted as a diagnostic attribute screen, not as evidence that the admission process was longitudinally in or out of statistical control.

A fishbone diagram organized plausible causes under people, process, information, tangibles, technology, and monitoring. In this study, these categories are treated as hypotheses for validation rather than proven causal mechanisms. Pareto prioritization ranked the reported problem frequencies, consistent with the diagnostic use of quality-improvement tools in both process and educational settings [14, 15, 17]. The source table provided exact counts for four categories

and percentages based on 313 total checked problems; the remaining 141 responses were therefore shown only as an aggregated "other recorded problems" category. The ranking was used descriptively to focus attention on the most frequently reported weaknesses; no fixed 80/20 assumption was imposed.

## 2.4 Ethical safeguards

Participation was voluntary, respondents were informed of the academic and service-improvement purpose, and results were reported only in aggregate. No personally identifying information was included. Prior to submission, the authors should insert the applicable institutional ethics-clearance or exemption reference, because no approval number was available in the source manuscript.

## 3. RESULTS AND DISCUSSION

### 3.1 Respondent and transaction context

The largest age group was 19-21 years (40, 43.48%), followed by respondents aged 22 years and above (32, 34.78%) and those 18 years and below (20, 21.74%). Males accounted for 52.17% and females for 47.83%. BS Information Technology was the largest program group (37, 40.22%), and incoming first-year applicants formed the majority (56, 60.87%). Submission of requirements was the most frequently reported transaction (32, 34.78%), followed by application processing (18, 19.57%), document verification (17, 18.48%), status follow-up (13, 14.13%), and inquiry (12, 13.04%). These distributions indicate that the findings primarily reflect first-year, face-to-face admission experiences.

### 3.2 Perceived admission service quality

**Table 1. Adapted SERVQUAL results by dimension (n = 92)**

| Dimension      | Mean | SD   | Interpretation |
|----------------|------|------|----------------|
| Tangibles      | 2.57 | 0.39 | Low            |
| Reliability    | 4.03 | 0.37 | High           |
| Responsiveness | 3.97 | 0.39 | High           |
| Assurance      | 4.16 | 0.37 | High           |
| Empathy        | 4.14 | 0.32 | High           |
| Overall        | 3.78 | 0.13 | High           |

Table 1 shows high overall perceived admission service quality ( $M = 3.78$ ,  $SD = 0.13$ ). Assurance obtained the highest rating ( $M = 4.16$ ), followed by empathy ( $M = 4.14$ ), reliability ( $M = 4.03$ ), and responsiveness ( $M = 3.97$ ). Applicants therefore viewed staff-related interaction as generally courteous, dependable, helpful, and professional. This pattern is consistent with higher education evidence linking service-quality dimensions with student satisfaction and loyalty-related outcomes [4, 7, 8].

Tangibles was the only low-rated dimension ( $M = 2.57$ ,  $SD = 0.39$ ). The result indicates that the main weakness was not primarily interpersonal conduct but the visible and physical support surrounding the transaction: signage, directions, forms, instructions, and access to information. Higher education studies likewise identify physical, administrative, and student-support conditions as relevant components of perceived quality and satisfaction [2, 3, 9, 11, 12]. For admission services, a low tangible score is especially

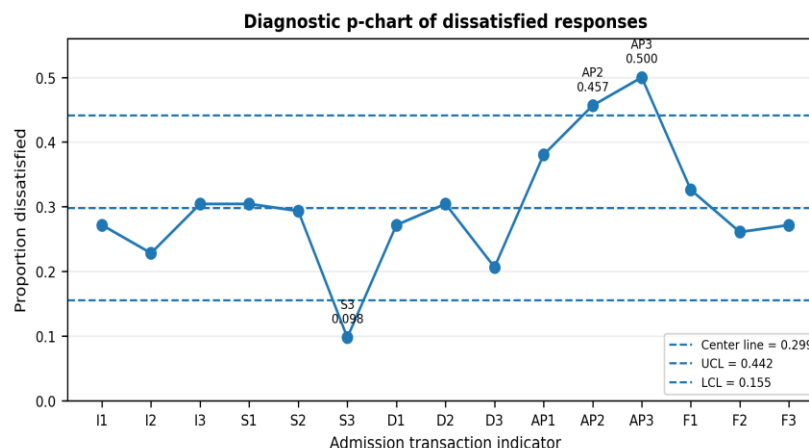
consequential because applicants may be unfamiliar with the campus and the process.

### 3.3 Diagnostic p-chart of dissatisfied responses

**Table 2. Dissatisfaction proportions and diagnostic signals**

| Code | Indicator                              | Dissatisfied | p     | Diagnostic signal |
|------|----------------------------------------|--------------|-------|-------------------|
| I1   | Inquiry clarity                        | 25           | 0.272 | Within limits     |
| I2   | Inquiry response time                  | 21           | 0.228 | Within limits     |
| I3   | Inquiry accuracy/consistency           | 28           | 0.304 | Within limits     |
| S1   | Requirement clarity/completeness       | 28           | 0.304 | Within limits     |
| S2   | Ease of submission                     | 27           | 0.293 | Within limits     |
| S3   | Guidance on incomplete requirements    | 9            | 0.098 | Below LCL         |
| D1   | Document-checking accuracy             | 25           | 0.272 | Within limits     |
| D2   | Clarity of deficiency feedback         | 28           | 0.304 | Within limits     |
| D3   | Verification completion time           | 19           | 0.207 | Within limits     |
| AP1  | Processing efficiency                  | 35           | 0.380 | Within limits     |
| AP2  | Next-step information after submission | 42           | 0.457 | Above UCL         |
| AP3  | Organized/systematic processing        | 46           | 0.500 | Above UCL         |
| F1   | Ease of status follow-up               | 30           | 0.326 | Within limits     |
| F2   | Clear/helpful status updates           | 24           | 0.261 | Within limits     |
| F3   | Prompt follow-up response              | 25           | 0.272 | Within limits     |

Note:  $n = 92$  per indicator; center line = 0.299; UCL = 0.442; LCL = 0.155.



**Figure 1. Corrected diagnostic p-chart of dissatisfied responses**

Two indicators exceeded the corrected upper limit: AP2, next-step information after submission ( $p = 0.457$ ), and AP3, organized or systematic processing ( $p = 0.500$ ). These values identify application processing as the most urgent diagnostic concern. AP1, processing efficiency ( $p = 0.380$ ), remained within the calculated limits but was still practically high and should be reviewed with AP2 and AP3. A point within calculated limits should not automatically be treated as satisfactory when its underlying dissatisfaction proportion remains operationally important; the chart is therefore used together with practical service priorities and root-cause review [14, 17].

S3, guidance for applicants with incomplete requirements, fell below the lower limit ( $p = 0.098$ ). This unusually favorable result may indicate a useful local practice, such as direct explanation, a clear checklist, or more focused staff assistance. The practice should be documented and tested for transfer to application processing and status follow-up. Because the chart compares indicators rather than time-ordered subgroups, these signals indicate priorities for investigation; they do not independently prove special causes in a stable process.

### 3.4 Root-cause synthesis

Root-cause hypotheses derived from the SERVQUAL, p-chart, and checklist results

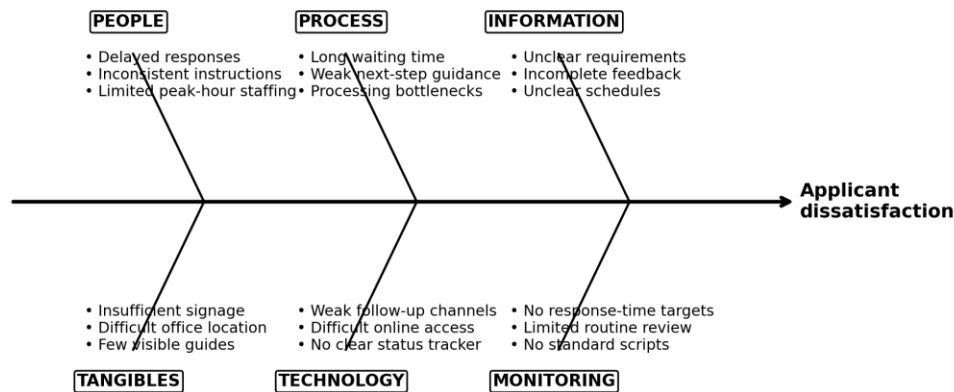


Figure 2. Fishbone synthesis of plausible causes requiring process validation

The fishbone synthesis presented in Figure 2 indicates that dissatisfaction is multi-causal. People-related hypotheses include delayed responses, inconsistent instructions, and insufficient coverage during peak periods. Process hypotheses include queues, repeated submissions, unclear handoffs, and weak next-step guidance. Information and tangible causes include unclear requirements, incomplete feedback, insufficient signs, and difficulty locating offices. Technology and management causes include weak follow-up channels, lack of a status-tracking mechanism, absent response-time targets, and limited routine monitoring.

### 3.5 Priority problems and integrated implications

Table 3. Priority problem frequencies

| Rank | Problem                               | f   | %     | Cum. % |
|------|---------------------------------------|-----|-------|--------|
| 1    | Lack of signage/directional guides    | 82  | 26.20 | 26.20  |
| 2    | Unclear admission requirements        | 42  | 13.42 | 39.62  |
| 3    | Long waiting time                     | 26  | 8.31  | 47.92  |
| 4    | Difficulty locating transaction areas | 22  | 7.03  | 54.95  |
| -    | Other recorded problems*              | 141 | 45.05 | 100.00 |

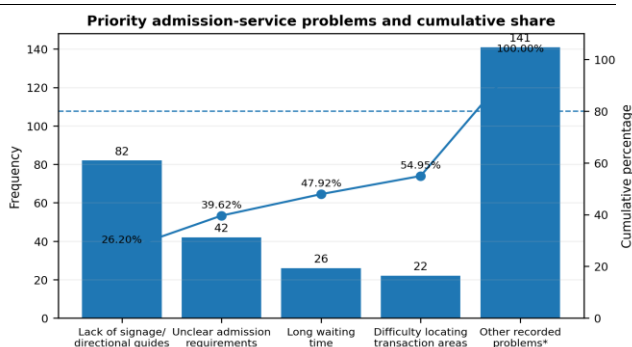


Figure 3. Pareto-based priority analysis

These are not causal findings from experimental or qualitative evidence. They are structured hypotheses derived from the survey results and should be validated through

workflow observation, queue-time measurement, document review, and interviews with applicants and admission personnel.

The four reported priority problems represented 54.95% of all 313 checked service issues. Lack of signage or directional guides was the most frequent individually reported problem (82, 26.20%), followed by unclear admission requirements (42, 13.42%), long waiting time (26, 8.31%), and difficulty locating transaction areas (22, 7.03%). The convergence of three analyses is notable: tangibles was the lowest SERVQUAL dimension, the problem checklist was dominated by wayfinding and clarity issues, and application-processing indicators generated the highest dissatisfaction proportions.

The findings therefore do not support a generic recommendation to “improve service.” They support a targeted redesign of the applicant information journey. Applicants need visible directions before they reach the office, a single authoritative checklist during submission, explicit feedback when documents are incomplete, and a written or digital next-step message after processing. Evidence from educational technology shows that user satisfaction can be evaluated systematically in digital learning environments [18], while Elsevier research links higher-education e-service quality with favorable word-of-mouth behavior [19]. At USTP, evaluation of an online accreditation management system likewise demonstrated the value of structured performance, usability, and user-satisfaction monitoring for institutional digital services [20]. Similarly, facilitating conditions significantly influenced students' utilization of digital platforms, particularly when appropriate technological resources and internet connectivity were available [21]. This finding suggests that the proposed digital admission guides, QR-linked information, and online follow-up mechanisms should be accompanied by accessible technological resources and reliable connectivity to maximize their usefulness to applicants. The importance of systematic evaluation is further supported by the usefulness of a structured, multidimensional approach to assessing participant satisfaction across content and relevance,

implementation and delivery, and impact and engagement [22]. Although conducted in educational and professional-development settings, these findings reinforce the importance

of accessible digital infrastructure and evidence-informed monitoring when implementing service-improvement initiatives.

**Table 4. Evidence-based admission service improvement plan**

| Priority                 | Corrective action                                                                                                                          | Monitoring indicator                                           |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Wayfinding and tangibles | Install directional signs, transaction maps, queue labels, and QR-linked admission guides at campus entry and key decision points.         | Tangibles mean; signage complaints; office-location complaints |
| Requirements clarity     | Issue one version-controlled checklist showing required documents, deadlines, incomplete-document rules, and responsible contact channels. | Requirement-clarity complaints; repeated submissions           |
| Application processing   | Provide every applicant with a next-step slip or automated message showing status, expected processing time, and follow-up instructions.   | AP2 and AP3 dissatisfaction proportions                        |
| Response consistency     | Use standard response scripts and a documented response-time target for inquiries and follow-ups; assign peak-period coverage.             | Inquiry response time; follow-up response; waiting time        |
| Continuous monitoring    | Collect data by admission week or batch and use time-ordered p-charts; review signals with the Quality Assurance Office.                   | Weekly/periodic p-chart; corrective-action closure rate        |

### 3.6 Study limitations

The study used purposive sampling from one campus, and all respondents experienced face-to-face transactions; generalization to other campuses, admission cycles, or digital services is therefore limited. The findings relied on self-reports and encoded counts, while actual waiting times, queue lengths, error rates, and processing durations were not observed.

The adapted SERVQUAL instrument measured perceptions only, not expectation-perception gaps. The exact rule used to dichotomize responses as dissatisfied was not documented in the source manuscript. In addition, the p-chart indicators were answered by overlapping respondents and were not ordered by time, so the chart is diagnostic rather than a formal process-stability analysis. Fishbone causes remain hypotheses, and the detailed frequencies of the remaining Pareto categories were unavailable. These limitations should guide replication rather than be hidden.

### 4. CONCLUSIONS AND RECOMMENDATIONS

Admission service quality at USTP-Balubal was rated high overall, with strong assurance, empathy, reliability, and responsiveness. Nevertheless, the low tangibles score and the concentration of dissatisfaction in application processing show that courteous staff interaction alone is insufficient. Applicants require a process that is visible, understandable, predictable, and easy to follow.

The corrected diagnostic p-chart identified next-step information and organized processing as the highest-priority transaction indicators, while guidance for incomplete requirements appeared to be a process strength worth replicating. The priority analysis reinforced the need to address signage, requirement clarity, waiting time, and office accessibility. Accordingly, the campus should implement standardized checklists and scripts, visible and digital wayfinding, written next-step guidance, response-time standards, and periodic quality reviews.

For stronger future evidence, the Admissions Office should collect dissatisfaction data by actual admission week, batch, or service window, enabling independent time-ordered subgroups and defensible control-chart interpretation. Future studies should also document the dissatisfaction cut-off,

report complete content-validity indices, measure actual processing and waiting times, and validate root causes through interviews and direct process observation.

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