

Assessing Service Quality in Yemeni Public Schools: A SERVQUAL Analysis of Teacher Perceptions

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Abstract

This study assesses service quality in Yemeni public schools by analyzing teacher perceptions through the SERVQUAL framework. It addresses a significant gap in the literature, as existing research on Yemen's conflict-affected education system focuses primarily on structural damages and enrolment challenges, neglecting systematic measurement of day-to-day service quality from teachers' operational perspectives. Employing a quantitative cross-sectional design, data was collected from 559 teachers across three strategically selected governorates of Sana'a, Aden, and Taiz using stratified random sampling. A validated, contextually adapted Arabic SERVQUAL questionnaire measured the five core dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Descriptive statistics and analysis of variance (ANOVA) were employed to analyze the data. Results revealed consistently low to moderate perceptions across all service quality dimensions, with a mean range of 2.39 to 2.61 on a 5-point scale. The dimension of empathy received the most favorable evaluations ($M = 2.61$), while tangibles were perceived as the most deficient ($M = 2.39$). ANOVA results demonstrated a statistically significant main effect of school level on service quality perceptions, $F(9, 548) = 6.074, p < .001$. Post-hoc tests revealed that teachers in Basic Education (Grades 1–9) reported significantly lower perceptions of service quality than those in Secondary Education (Grades 10–12), with a mean difference of $-16.88, p = .002$. However, the overall model explained a modest portion of the variance ($R^2 = .091$). These findings highlight systematic service delivery failures extending beyond resource scarcity to encompass administrative and relational gaps, with notable inequities between educational stages. The study concludes that targeted, multidimensional interventions prioritizing infrastructure rehabilitation alongside administrative process improvements, with a specific focus on basic education, are urgently needed to support sustainable educational recovery in Yemen's protracted humanitarian crisis.

Keywords: *Service quality, SERVQUAL, Yemeni public schools, conflict-affected education, ANOVA.*

INTRODUCTION

The pursuit of educational quality remains a central objective for educational systems worldwide, serving as a critical lever for human capital development, social mobility, and national progress. Within this broad paradigm, the concept of service quality has emerged as a pivotal analytical lens, shifting focus from mere resource inputs to the actual experience and satisfaction of stakeholders, students, parents, and crucially, teachers. Originating in the commercial sector with the seminal work of Parasuraman et al. (1985, 1988), the SERVQUAL framework has been extensively adapted to measure this experiential dimension in education. It posits that quality is not an absolute standard but is perceived through the gap between expectations and experiences across five tangible and intangible dimensions: (1) Tangibles (physical facilities, equipment, and materials); (2) Reliability (the ability of an institution to perform the promised service dependably and accurately); (3) Responsiveness (willingness to help and provide prompt service); (4) Assurance (knowledge and courtesy of staff and their ability to inspire trust and confidence); and (5) Empathy (the provision of caring, individualized attention).

In stable educational contexts, from primary schools to universities across diverse cultures, robust correlations have been established between high SERVQUAL scores and key institutional outcomes, including increased stakeholder satisfaction, improved institutional reputation, and enhanced student achievement (Abdullah & Kassim, 2021; Lee, 2017; Polyakova & Ramchandani, 2023). Empirical support for these relationships is further demonstrated by recent findings; for example, a 2025 PLS-SEM analysis confirms that institutional reputation significantly boosts student loyalty ($\beta = 0.556$, $p < 0.001$) and that this loyalty is a very strong direct predictor of student retention ($\beta = 0.765$, $p < 0.001$) (Albornoz-Toyohama et al., 2025).

However, the theoretical and practical application of service quality models faces profound challenges when transposed to education in emergencies (EiE) and protracted crisis settings. In environments characterized by active conflict, systemic collapse, and acute resource scarcity, the very definitions of "quality" and "service" require fundamental reconceptualization. This study situates itself within this critical juncture, focusing on Yemen, whose public education system has endured near-total devastation following nearly a decade of relentless conflict (World Bank, 2023). The research is driven by a compelling imperative to move beyond the well-documented narrative of structural ruin and to systematically investigate the operational reality of service delivery within the schools that persist against all odds. By applying and adapting the SERVQUAL framework to this extreme context, this study seeks to generate the first empirical, multi-dimensional diagnostic of service quality from the perspective of Yemen's teachers the frontline custodians of education. Their daily experiences, morals, and professional efficacy are both a barometer of the system's health and a prerequisite for its recovery.

The backdrop against which this study is set is one of unparalleled educational catastrophes. Since 2015, Yemen has been engulfed in a complex and devastating war that has systematically dismantled its social infrastructure, with the education sector suffering some of the most severe blows. The scale of the damage is both vast and multi-faceted. According to United Nations agencies and the World Bank, over 2,400 schools have been rendered directly damaged, destroyed, or repurposed for military or humanitarian use, eliminating safe learning spaces for millions of children (UNICEF, 2023; World Bank, 2021). Perhaps even more debilitating to the system's human capital has been the widespread and protracted suspension of teacher salaries, which has persisted for years in many regions. This has pushed a dedicated professional class into severe economic precarity, eroding morale, triggering mass attrition, and compelling those who remain to seek alternative livelihoods, often at the direct expense of their teaching duties (UN Security Council, 2022).

Compounding these issues are severe shortages of the most basic educational materials textbooks, stationery, furniture and crippling deficits in essential utilities like electricity, clean water, and sanitation facilities in those schools that remain open. The cumulative effect is a system in a state of permanent emergency, where the primary objective has shifted from educational development to sheer survival and continuity. This context renders traditional models of educational assessment, which

often assume a baseline of functionality and resource availability, insufficient if not entirely obsolete. The SERVQUAL framework itself, while robust, was not designed for contexts where the "tangibles" dimension may refer to the presence of a roof and safety from shelling rather than modern computing equipment, or where "reliability" may be benchmarked against the sporadic delivery of salaries or teaching materials amidst a blockade. Therefore, applying SERVQUAL in Yemen necessitates more than translation; it requires a deep contextual adaptation that acknowledges these radically altered baseline conditions while preserving the framework's core diagnostic utility to uncover specific, actionable service failures (Lee & Kim, 2023; Shah & Lopes, 2015).

However, a critical problem emerges within this landscape. The prevailing narrative of Yemen's education crisis is overwhelmingly dominated by macro-level quantitative indicators, such as the percentage of non-functional schools or the number of out-of-school children. While vital for mapping the scale of the disaster, such macro-level data creates a significant epistemological and practical gap. The epistemological gap lies in the disconnect between knowing what has been destroyed and understanding how the remaining institutions function from the perspective of those sustaining them—the teachers. The practical gap is that, without micro-level data on teachers' perceptions of service quality (e.g., administrative support, resource reliability, and perceived safety), recovery interventions risk being inefficient and misaligned with the most critical operational pain points.

This points directly to two substantial and interconnected research gaps that this study aims to address. First, it tackles a theoretical application gap: While SERVQUAL is well-established in stable educational settings, its systematic adaptation and application within active, protracted conflict zones remains notably scarce. This study provides a critical test of SERVQUAL's utility in an extreme environment, offering a methodological contribution to EiE research. Second, and most critically, it addresses a profound contextual-empirical gap for Yemen: While the structural devastation is well-chronicled, there is a complete absence of scholarly work that quantitatively assesses service quality from the teacher's viewpoint using a validated theoretical framework. By leaving this experiential core of the crisis unmeasured, the current evidence base cannot identify whether the most critical failures lie in resources, administration, or psychological support, thereby impeding effective recovery. Therefore, this study addresses these gaps by applying and adapting the SERVQUAL framework to generate the first empirical diagnostic of service quality in Yemen's TVET sector from the frontline perspective of its teachers.

OBJECTIVES OF THE STUDY

This study addresses two core research objectives. First, it aims to assess the level of service quality in Yemeni public schools as perceived by teachers through an analysis of the five SERVQUAL dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Second, it investigates the differences in teachers' perceptions of service quality within these schools by grade level (primary, intermediate, or secondary)

RESEARCH QUESTIONS

Derived directly from the study's objectives, the following research questions were formulated:

- 1) What is the level of service quality in Yemeni public schools as perceived by teachers across the five SERVQUAL dimensions (tangibles, reliability, responsiveness, assurance, and empathy)?
- 2) Do teachers' perceptions of service quality in Yemeni public schools differ significantly by grade level?

LITERATURE REVIEW

Service Quality in Education

Service quality in educational contexts has been extensively studied through the SERVQUAL framework developed by Parasuraman et al. (1985), which measures the gap between stakeholder expectations and perceptions across five dimensions: tangibles (physical facilities and resources, such as the condition of school buildings and availability of textbooks), reliability (dependable and accurate service, such as consistent curriculum delivery and administrative processes), responsiveness (promptness and willingness to help, such as timely responses to teacher and student inquiries), assurance (inspiring trust and confidence through knowledge and courtesy, such as professional competence of staff), and empathy (providing individualized care and attention, such as recognizing and accommodating individual needs). In stable educational systems, research consistently demonstrates that higher service quality correlates with increased stakeholder satisfaction, improved institutional performance, and enhanced learning outcomes (Lee, 2017; Polyakova & Ramchandani, 2023). Traditional applications in higher education and primary schooling have focused on measuring efficiency, resource availability, and administrative responsiveness as indicators of institutional effectiveness.

Service Quality in Crisis and Fragile Contexts

The application of service quality models in conflict-affected and fragile educational systems requires significant contextual adaptation. Recent scholarships have evolved to address how "quality" is reconceptualized when institutions operate under conditions of scarcity, insecurity, and systemic collapse (Lee & Kim, 2023; Shah & Lopes, 2015). In such environments, service quality shifts from measuring abundance or efficiency to assessing the dignity, fairness, and resilience with which limited resources are administered. For example, in the Yemeni context, where salaries are suspended and infrastructure is destroyed, "dignity" may be measured by the respect shown to unpaid teachers, "fairness" by the equitable distribution of scarce supplies, and "resilience" by the system's capacity to maintain basic operations like scheduling and safety. Research in conflict-affected regions indicates that even basic service consistency such as predictable schedules, safe learning spaces, and reliable administrative support becomes a critical determinant of educational continuity and community trust (Abdullah & Kassim, 2021; Kermansachi et al., 2022).

The Yemeni Educational Context

Yemen's education system has experienced catastrophic decline since 2015, with the conflict resulting in damaged infrastructure, fragmented governance, and the suspension of teacher salaries (UN Security Council, 2022; World Bank, 2021). Recent analyses document that over 2,400 schools are non-functional, and millions of children remain out of school, while teachers operate without consistent support or resources (Al-Sharjabi, 2025; UNICEF, 2023). Despite this well-documented collapse, a systematic review of education in Yemen confirms the absence of studies examining service quality from a structured, diagnostic perspective (Al-Selwi & Al-Hidabi, 2023). Existing studies focus primarily on structural damages, such as the direct impact of conflict on school buildings (World Bank, 2023), enrolment statistics detailing the scale of access denial (UNICEF, 2023), or broad humanitarian needs assessments (Global Education Cluster, 2024). However, no study has systematically measured the day-to-day service delivery experiences of educators using validated diagnostic frameworks like SERVQUAL.

THEORETICAL FRAMEWORK: THE SERVQUAL MODEL

The theoretical foundation of this study is anchored in the SERVQUAL model developed by Parasuraman et al. (1985, 1988). This framework posits that service quality is determined by the gap between customers' expectations and perceptions across five distinct dimensions. These dimensions include: (1) Tangibles, which refer to the physical facilities, equipment, and materials provided in schools to support teaching and learning. In an educational context, examples include the condition of classrooms, the availability of textbooks, and the functionality of computer laboratories; (2) Reliability, which is the ability of an institution to perform the promised service dependably and accurately.

Examples in education include the consistent delivery of the curriculum, accurate record-keeping, and adherence to the academic schedule; (3) Responsiveness, which refers to the willingness of an institution to help and provide prompt service. Examples of responsiveness in education include timely administrative responses to teacher requests and the efficient resolution of student issues; (4) Assurance, which refers to the knowledge and courtesy of staff and their ability to inspire trust and confidence. Examples in education include the professional competence of teachers and the perceived safety and fairness of the school environment; and finally (5) Empathy, which refers to the provision of caring, individualized attention. Examples of empathy in education include recognizing and addressing the specific needs of individual students or teachers.

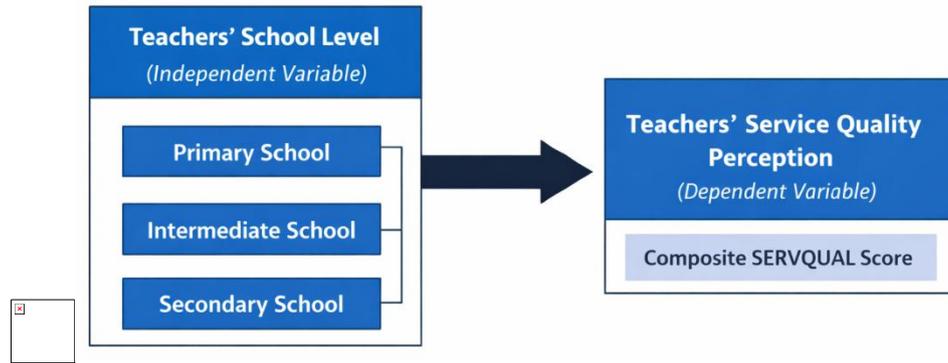
SERVQUAL has been extensively validated across various service sectors and cultural contexts, demonstrating relevance for educational settings where both physical resources and interpersonal interactions contribute to institutional effectiveness (Zeithaml et al., 1990). Its multidimensional approach provides a comprehensive diagnostic tool that can identify specific areas of service deficiency, which is crucial for targeted improvement strategies in resource-constrained environments like Yemen. In this study, the SERVQUAL framework is integrated with recent theoretical developments in Education in Emergencies (EiE) scholarship. Scholars such as Shah and Lopes (2015) and Lee and Kim (2023) argue that in crisis-affected contexts, traditional quality indicators must be reconceptualized to account for conditions of scarcity, insecurity, and institutional fragility. Their theoretical work suggests that in such environments, service quality manifests not through abundance or efficiency but through dignity in treatment, fairness in resource distribution, resilience in service continuity, and adaptability to changing circumstances. This theoretical integration allows for a context-sensitive and precise application of SERVQUAL that acknowledges Yemen's unique realities while maintaining the framework's power to diagnose specific, actionable service failures.

CONCEPTUAL FRAMEWORK

This study's conceptual framework is presented in Figure 1. It models the relationship between teachers' school level and their perceptions of service quality. The independent variable, Teachers' School Level, is represented as three distinct groups: Primary School, Intermediate School, and Secondary School. These groups are hypothesized to have a significant influence on the dependent variable, Teachers' Service Quality Perception, which is operationally measured as a composite SERVQUAL Score.

The framework proposes that perceptions of service quality across the five dimensions of tangibles, reliability, responsiveness, assurance, and empathy will vary systematically across school levels. This hypothesis is grounded in the rationale that different educational stages operate under distinct administrative pressures, curricular demands, and student developmental needs, which likely lead to variations in resource allocation, administrative support, and the overall service environment. For instance, secondary schools with national examination pressures may experience different challenges regarding resource reliability and administrative responsiveness compared to primary schools.

This model directly informs the research design. Descriptive statistics will assess the overall SERVQUAL score, and inferential analysis (one-way ANOVA) will test whether the observed differences in service quality perceptions among the three school levels are statistically significant.

Figure 1*Conceptual Framework*

METHODOLOGY

Research Design

This study centers on teachers' perceptions of service quality, measured as a composite dependent variable derived from their ratings across the five SERVQUAL dimensions. A survey instrument was developed for the Yemeni context, in which each SERVQUAL dimension (tangibles, reliability, responsiveness, assurance, and empathy) was assessed using a series of items rated on a five-point Likert scale. The key independent variable is school level, a categorical variable with three groups (primary, intermediate, and secondary), collected through a demographic question. The analysis involves two main steps. First, descriptive statistics (means and standard deviations) will be used to summarize the overall service quality score and the scores for each SERVQUAL dimension. Second, a one-way Analysis of Variance (ANOVA) will be conducted using IBM SPSS Statistics to test the hypothesis that perceived service quality differs significantly among the three school levels. Hence, the research design is a cross-sectional causal-comparative (*ex post facto*) design. It is considered *ex post facto* (non-experimental) because no intervention was involved and the three school levels (primary, intermediate, and secondary) were pre-existing in the Yemeni governorates prior to data collection.

Population and Sample

The target population encompassed all teachers currently employed in public primary, intermediate, and secondary schools across three strategically selected governorates of Sana'a, Aden, and Taiz in Yemen. These regions were purposively chosen to represent the northern, southern, and central administrative divisions of Yemen, thereby capturing the diverse geopolitical, conflict-affected, and operational realities within the country's fragmented educational landscape. By including these three distinct zones, the study aimed to generate findings that reflect the varied experiences of educators operating under different local authorities, levels of infrastructure damage, and humanitarian access conditions.

The sample comprised 559 public school teachers working in the Yemeni governorates of Sana'a, Aden, and Taiz. They consisted of 311 female teachers (55.5%) and 248 male teachers (44.4%), which is broadly reflective of the gender distribution within Yemen's teaching workforce. The respondents represented diverse educational levels, with 303 teachers (54.2%) from Basic Education (Grades 1–9), 217 teachers (38.8%) from Secondary Education (Grades 10–12), and 39 teachers (7.0%) from Preschool. Proportional representation was also sought across the three governorates, and the specific demographic distribution is presented in full in Table 2.

Sampling Procedures

Stratified random sampling was rigorously employed to ensure proportional representation across the key strata of governorate (Sana'a, Aden, and Taiz) and school level (primary, intermediate, secondary). The sampling frame was constructed using the most recent official registries available from Yemen's Ministry of Education, cross-referenced with lists provided by local school administrators to account for staffing changes. The minimum sample size was determined using Krejcie and Morgan's (1970)

formula for large populations, which indicated a requirement of at least 384 respondents for a 95% confidence level with a 5% margin of error. Anticipating potential non-response and logistical hurdles in data collection common in crisis-affected research the target sample size was increased. Hence a total of 600 questionnaires were distributed. The final analyzed sample comprised 559 completed responses, yielding a very strong response rate and comfortably meeting the minimum statistical power requirements.

Instrument

The survey instrument was a structured questionnaire based on the SERVQUAL framework developed by Parasuraman et al. (1985). It measured five dimensions tangibles, reliability, responsiveness, assurance, and empathy using five items per dimension, resulting in a total of 25 items. These items were adapted for the Yemeni educational context through a multi-stage process. The adaptation involved forward translation from English to Arabic by a bilingual education expert, followed by back-translation by an independent translator to ensure conceptual equivalence. Items were also contextually modified to reflect crisis conditions. For example, “modern-looking equipment” (tangibles) was rephrased to assess the availability of basic functional furniture and safe learning spaces instead, while “prompt service” (responsiveness) was adapted to capture the timeliness of crisis-related administrative support. This process maintained theoretical alignment with SERVQUAL while ensuring cultural and contextual relevance. Table 1 presents the SERVQUAL dimensions, their definitions, and sample item

Table 1
SERVQUAL Constructs, Definitions and Sample Items in the Instrument

SERVQUAL Construct and Definition	Sample Survey Items
1) Tangibles (The physical facilities, equipment, and learning environment)	a) The principal ensures that athletic facilities are accessible and well-maintained. b) Educational tools and materials that are readily available are beneficial for the development of academic skills.
2) Reliability (The dependability and accuracy of administrative services and procedures)	a) The principal makes sure that requests are handled quickly. b) The principal makes sure that grievances are resolved quickly.
3) Responsiveness (The willingness and promptness to help and respond to teachers' and students' needs)	a) The principal is quick to respond in solving the needs of school. b) The principal responds promptly to issues that teachers encounter.
4) Assurance (The competence, courtesy, and trust-inspiring behavior of the administration)	a) The principal exhibits a high level of competence in carrying out his/her duties. b) The principal delivers services in a kind and considerate way.
5) Empathy (The provision of caring, individualized attention to students and teachers)	a) The principal listens attentively to students' concerns. b) The principal encourages staff to address students' concerns with care.

Reliability of the Measures

The adapted instrument demonstrated strong psychometric properties, confirming its reliability for use

in this unique context. Internal consistency, measured by Cronbach's alpha coefficients, was robust for all five dimensions: Tangibles ($\alpha = .86$), Reliability ($\alpha = .88$), Responsiveness ($\alpha = .84$), Assurance ($\alpha = .87$), and Empathy ($\alpha = .85$). All values exceeded the conventional threshold of .70, indicating that the items within each dimension cohesively measured the same underlying construction of service quality. Furthermore, composite reliability scores also exceeded .70 for all dimensions, providing additional confirmation of the scale's reliability. These results affirm that the adapted SERVQUAL instrument is a reliable tool for measuring service quality perceptions in Yemen's conflict-affected public schools.

DATA COLLECTION AND ANALYSIS

Data Collection Process

Data collection was conducted over a six-month period from January to June 2025. To maximize reach and overcome challenges related to mobility, insecurity, and Internet connectivity, a dual-mode administration strategy was implemented. This included: (1) Digital surveys distributed via encrypted, widely used platforms such as email, WhatsApp, and Telegram to teachers with reliable Internet access; and (2) Physical paper questionnaires disseminated and collected through trusted school liaisons and local educational coordinators in areas with poor connectivity. This mixed-method approach to distribution was crucial for achieving a representative sample. All participants were provided with a detailed information sheet and provided explicit informed consent prior to participation. The study received full ethical approval from the International Islamic University Malaysia's Research Ethics Committee (REF: IIUM-IRB-2024-EDU-045), ensuring adherence to principles of voluntary participation, anonymity, and data confidentiality.

Data Analysis

The quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS), Version 21. The analysis was conducted in two sequential phases aligned with the research objectives. First, descriptive statistics including frequencies, percentages, means, and standard deviations were computed to summarize the demographic profile of respondents and to address the first research objective (i.e., the level of service quality in Yemeni public schools as perceived by teachers across the five SERVQUAL dimensions). This involved calculating the mean score and dispersion for each of the 25 SERVQUAL items and for the five composite dimension scores (Tangibles, Reliability, Responsiveness, Assurance, and Empathy), providing a clear profile of the "level" of perceived service quality.

Second, to address the second research objective concerning differences in teachers' perceptions of SERVQUAL by grade level, inferential statistics were employed. A one-way analysis of variance (ANOVA) was conducted. Prior to the analysis, the underlying assumptions of ANOVA were tested. The assumptions of normality, homogeneity of variances (Levene's test), and independence of observations were examined and found to be satisfactorily met. This test was selected to examine the main effects of an independent factor grade level (primary, intermediate, secondary) on the dependent variable of overall service quality perception score. Crucially, the one-way ANOVA also tested for a potential interaction effect between these two factors. For any independent variable showing a statistically significant main effect, post-hoc tests (such as Tukey's HSD) were conducted to identify exactly which specific group differences were significant. The alpha level for determining statistical significance was set at $p < .05$ for all tests.

RESULTS OF THE STUDY

Sample Demographics

The demographic characteristics of the 559 teacher respondents who participated in the study are summarized in Table 2. The sample included teachers from primary, intermediate, and secondary schools across three governorates, providing a diverse profile for analysis. The sample had a higher proportion of female teachers ($n=311$, 55.5%) than male teachers ($n=248$, 44.4%). In terms of age distribution, the largest group was teachers aged 41–50 years ($n=233$, 41.7%), indicating that the

sample is predominantly composed of experienced, mid-career educators. Those aged 31–40 constituted 27.9% (n=156), while younger teachers (30 years and below) made up 19.7% of the sample. Regarding academic qualifications, the majority held a bachelor’s degree (n=328, 58.7%), followed by a Diploma (n=122, 21.8%). Teaching experience was notably high, with over half of the respondents (n=303, 54.2%) having more than ten years of experience, underscoring the sample’s professional maturity. In terms of the grade levels they teach, a majority (54.2%) were involved in Basic Education (Grades 1–9) (n=303), followed by Secondary Education (Grade 10–12) (n=217, 38.8%), and a smaller number in Preschool (n=39, 7.0%). This demographic profile confirms that the respondents are well-established, qualified professionals capable of providing informed perceptions of service quality in their respective schools.

Table 2
Demographic Information of Respondents (N = 559)

Demographic Variables	N	%
Gender		
■ Female	311	55.5
■ Male	248	44.4
Age		
■ 21–30	97	17.4
■ 31–40	156	27.9
■ 41–50	233	41.7
■ 51 and above	60	10.7
■ Under 20	13	2.3
Academic Level		
■ Bachelor's Degree	328	58.7
■ Diploma	122	21.8
■ High School	57	10.2
■ Master's Degree	52	9.3
Teaching Experience Years		
■ 1–3 years	70	12.5
■ 4–6 years	82	14.7
■ 7–10 years	81	14.5
■ Less than 1 year	23	4.1
■ More than 10 years	303	54.2
Grade Level Teaching		
■ Preschool/Kindergarten/Nursery (ages 3–5)	39	7.0
■ Basic Education (Grades 1–9)	303	54.2
■ Secondary Education (Grades 10–12)	217	38.8

Yemeni Public-School Teachers’ Perceptions Across the Five SERVQUAL Dimensions

The descriptive statistics for teachers' ratings on each SERVQUAL dimension are presented in Table 3. The table shows, for each questionnaire item, the frequency of Disagree (D), Undecided (U), and Agree (A) responses, along with the mean score, standard deviation (SD), and the rank of the item within its dimension. The following sections analyze the findings for each dimension: Tangibles, Reliability, Responsiveness, Assurance, and Empathy.

Table 3*Yemeni Teachers' Perceptions of Service Quality in Their Schools by Dimension (N = 559)*

Item	Response Categories			M	SD	Rank
	D	U	A			
Tangibles						
1) The principal ensures that athletic facilities are accessible/well-maintained.	82 (14.7)	49 (8.8)	428 (76.6)	2.39	.79	5
2) The educational tools and materials that are readily available are beneficial for the development of academic skills.	86 (15.4)	49 (8.8)	424 (75.8)	2.45	.79	3
3) The school consistently completes services on time.	90 (16.1)	65 (11.6)	404 (72.3)	2.44	.79	4
4) The principal makes sure that services adhere to a trustworthy timetable	87 (15.6)	61 (10.9)	411 (73.5)	2.49	.79	1
5) The entire school environment—inside, outside—is orderly, hygienic, and supportive of learning.	83 (14.8)	86 (15.4)	390 (69.8)	2.47	.79	2
Reliability						
1) The principal makes sure that requests are handled quickly.	116 (20.8)	92 (16.5)	351 (62.8)	2.42	.81	4
2) The principal makes sure that grievances are resolved quickly	100 (17.9)	90 (17.1)	369 (66.0)	2.48	.78	1
3) The principal guarantees timely grievance resolution and effective academic service delivery	95 (17.0)	105 (18.8)	359 (64.2)	2.47	.77	2
4) The principal makes certain that services adhere to a trustworthy timetable	89 (15.9)	100 (17.9)	369 (66.0)	2.50	.75	3
5) The principal makes sure that service protocols are straightforward, simple to adhere to	112 (20.0)	111 (19.9)	336 (60.1)	2.40	.80	5
Responsiveness						
1) The principal is quick to respond in solving the needs of school	83 (14.8)	78 (14.0)	398 (71.2)	2.56	.74	2
2) The principal provides easy-to-understand information	119 (21.3)	83 (14.8)	357 (63.9)	2.43	.82	5
3) The principal responds promptly to issues that teachers encounter	114 (20.4)	98 (17.5)	347 (62.1)	2.42	.81	4
4) Teachers' complaints and challenges are immediately addressed by the principal	99 (17.7)	102 (18.2)	358 (64.0)	2.46	.78	1
5) The principal listens carefully to the opinions of the instructors and responds accordingly	93 (16.6)	80 (14.3)	386 (69.1)	2.52	.76	3

Item	Response Categories			M	SD	Rank
	D	U	A			
Assurance						
1) The principal exhibits a high level of competence in carrying out their duties	97 (17.4)	87 (15.6)	375 (67.1)	2.50	.77	3
2) The principle delivers services in a kind and considerate way	100 (17.9)	62 (11.1)	397 (71.0)	2.53	.78	4
3) The principal is friendly and approachable while interacting with instructors	72 (12.9)	82 (14.7)	405 (72.5)	2.60	.71	1
4) Through the services offered, the principal makes sure that students feel protected and secure	96 (17.2)	93 (16.6)	370 (66.2)	2.49	.77	5
5) The principal helps teachers properly present the material	101 (18.1)	76 (13.6)	382 (68.3)	2.50	.78	2
Empathy						
1) The principal gives students' needs particular consideration	103 (18.4)	82 (14.7)	374 (66.9)	2.48	.79	2
2) The principal makes sure that teachers give students' needs extra consideration.	99 (17.7)	76 (13.6)	384 (68.7)	2.51	.78	4
3) The principal listens attentively to students' concerns	88 (15.7)	90 (16.1)	381 (68.2)	2.52	.75	1
4) The principal encourages staff to address students' concerns with care	106 (19.0)	80 (14.3)	373 (66.7)	2.48	.79	5

Teachers' perceptions across the five SERVQUAL dimensions reveal a consistent pattern of moderate service quality in Yemeni public schools. The Tangibles dimension suggests basic satisfaction with physical resources, though athletic facility maintenance scored lowest ($M = 2.39$, $SD = 0.80$). Reliability indicates that while grievance resolution is reasonably dependable ($M = 2.48$, $SD = 0.78$), procedural clarity and request handling need improvement. Responsiveness reflects general attentiveness but notable gaps in clear communication. Assurance highlights strong interpersonal rapport ($M = 2.60$, $SD = 0.71$) but weaker perceived attention to student safety. Empathy indicates fairness in student treatment ($M = 2.61$, $SD = 0.75$) but less consistent systemic care. Overall, interpersonal dimensions (Empathy, Assurance) are strongest, while tangible and procedural aspects require the most improvement. This pattern may reflect that while relational service quality is maintained in Yemen's schools, physical and administrative systems need targeted enhancement.

Differences in Service Quality Perceptions by School Level

A one-way analysis of variance (ANOVA) was conducted to test for significant differences in overall service quality perceptions across the three school levels (primary, intermediate, secondary). The results of this test are presented in Table 4.

Table 4*ANOVA Results of Between-Subjects Effects (Teaching Grade Level)*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	23494.322 ^a	9	2610.480	6.074	.000
Intercept	853986.775	1	853986.775	1986.905	.000
Teaching Grade Level	23494.322	9	2610.480	6.074	.000
Error	235534.533	548	429.808		
Total	4387545.000	558			
Corrected Total	259028.855	557			

a. R Squared = .091 (Adjusted R Squared = .076)

Table 4 presents the results of a one-way analysis of variance (ANOVA) conducted to investigate whether significant differences exist in teachers' perceptions of service quality across different teaching grade levels in Yemeni public schools. The analysis revealed a statistically significant overall effect of teaching grade level on service quality perceptions, $F(9, 548) = 6.074$ $p < .001 < .001$. This significant F-value indicates that at least one grade level group differs significantly from others in how they perceive the quality of services provided by their schools.

Although the ANOVA results were statistically significant, the effect size was modest, as teaching grade level accounted for only 9.1% of the variance in service quality perceptions ($R^2 = .091$). This suggests that school level is one relevant factor among several, with most of the variance attributable to other contextual or individual variables not captured in this model.

In practical terms, these findings indicate that school administrators and policymakers should consider grade-level specific approaches when addressing service quality improvements, as teachers at different educational stages may experience and evaluate school services differently. However, given the relatively small proportion of variance explained, comprehensive service quality enhancement strategies should also address other influential factors beyond grade level differentiation. These results provide empirical evidence supporting the inclusion of school level as a relevant factor in understanding service quality dynamics within Yemen's conflict-affected educational system.

Table 5 presents the results of post-hoc pairwise comparisons conducted using Tukey's Honestly Significant Difference (HSD) test to identify specific differences in service quality perceptions between teaching grade level groups. The analysis revealed only one statistically significant pairwise difference among the comparisons: teachers in the Basic Education level (Grades 1–9) reported significantly lower service quality perceptions compared to those in high school (Grades 9–12), with a mean difference of -16.88, $p = .002$. The effect size for this difference, calculated from the ANOVA, was small to medium (partial $\eta^2 = .091$). This indicates that high school teachers perceive substantially better service quality than their colleagues teaching basic education grades.

All other pairwise comparisons yielded non-significant results ($p > .05$). Notably, the comparison between the two identically labeled "Basic Education, Grades 1–9" categories showed a negligible mean difference of 0.5031 ($p = 1.000$), suggesting minimal variation within this grouping. Comparisons between Basic Education and other educational levels including Early Childhood (mean difference = 10.75, $p = .998$), Elementary Education (mean difference = 33.10, $p = .355$), Middle School (mean difference = 14.85, $p = .965$), and Preschool (mean difference = -5.15, $p = .999$) failed to reach statistical significance, indicating that service quality perceptions do not substantially differ between these educational stages.

Table 5
Post-Hoc Comparisons of School Service Quality Across Grade Levels

(I) Grade Level Teaching	(J) Grade Teaching Level	Mean Difference	Std. Error	Sig.
		e (I-J)		
Basic Education, Grades 1–9	Basic Education, Grades 1–9	.5031	2.47237	1.000
	Early Childhood (Pre-K to Grade 2)	10.7506	9.40381	.998
	Elementary Education (Grades 3–5)	33.1006	10.48437	.355
	High School (Grades 9–12)	16.8800*	3.30118	.002
	Middle School (Grades 6–8)	14.8506	8.60841	.965
	Preschool (Kindergarten/Nursery ages 3–5)	-5.1494	5.13306	.999

These findings suggest that the significant overall effect identified in the ANOVA primarily stems from the contrast between basic education and high school teachers, with minimal differentiation among other grade level categories. The pattern of results implies that service quality perceptions may be particularly challenging in basic education settings compared to high schools within Yemen's public education system, potentially reflecting differential resource allocation, administrative support, or contextual challenges across educational stages. However, the general lack of significant differences among most comparisons warrants caution in over-interpreting grade level as a predominant determinant of service quality perceptions.

DISCUSSION AND CONTRIBUTIONS

Summary of the Results

This study provides the first comprehensive assessment of service quality in Yemen’s conflict-affected public schools using the SERVQUAL framework. The findings reveal a consistent pattern of moderate to low perceptions across all five dimensions, with notable variations between relational and infrastructural aspects of service delivery. This pattern aligns with the theoretical expectation from Education in Emergencies (EiE) scholarship, which posits that in crisis contexts, relational dimensions like empathy and assurance may be maintained as adaptive practices, while tangible resources systematically collapse (Lee & Kim, 2023; Shah & Lopes, 2015).

The School-Level Divide and Implications for Equity in Crisis

The significant disparity in service quality perceptions between Basic Education (Grades 1–9) and Secondary Education (Grades 10–12) teachers provides a critical new layer to understanding inequality in fragmented systems. While existing reports meticulously document macro-level structural damage (World Bank, 2023) and enrolment drop (UNICEF, 2023), this finding reveals a *micro-level functional inequity*. It suggests that within the widespread collapse, remaining operational resources and administrative attention may be channeled toward higher educational stages, potentially leaving the foundational basic education sector which serves the largest number of students with the most deficient day-to-day service experience. This empirical evidence moves beyond documenting *what* is broken to suggest *how* systemic triage in a permanent emergency might inadvertently prioritize one group over another.

Theoretical Contribution: Validating Diagnostic Frameworks in Crises

This study answers the call for context-specific quality frameworks in EiE by demonstrating that a rigorously adapted SERVQUAL model can function as a precise diagnostic tool even in an active conflict zone. The model successfully identified specific, actionable service failures such as the low scores for athletic facility maintenance (Tangibles) and procedural clarity (Reliability) that generic needs assessments would overlook. This validates the approach of scholars like Shah and Lopes (2015), who argued for moving beyond resource inventories to capture the experiential dimension of service delivery under duress. The study's key findings and application of the model prove that established service-quality theory has strong explanatory portability to extreme contexts when its constructs are sensitively reconceptualized.

Practical Implications for Recovery and Policy

The results generate a clear, prioritized agenda for policymakers and humanitarian actors. First, interventions must address the most critical deficits in the Tangibles and Reliability dimensions of SERVQUAL ensuring safe infrastructure and predictable administrative processes as these are the dimensions teachers perceive most negatively. Second, the significant school-level disparity demands targeted support and resource audits for basic education schools to address the inequity. Finally, the relatively stronger scores in Assurance and Empathy indicate an asset: the preserved capacity for respectful, supportive interpersonal relations within schools. Recovery strategies should leverage this relational strength while systematically rebuilding the broken material and procedural foundations in post-war Yemeni public schools.

LIMITATIONS AND AVENUES FOR FUTURE RESEARCH

This study's cross-sectional design offers a snapshot, and its focus on three governorates may not capture all regional nuances within Yemen's complex crisis. Furthermore, the school-level variable, while significant, explained a modest portion of the overall variance ($R^2 = .091$), underscoring that many other factors such as local governance, community involvement, or individual teacher resilience influence service quality perceptions. Future research should employ longitudinal designs to track perceptions over time and use mixed methods to investigate the potent, yet unmeasured, contextual variables that are likely to account for the majority of variance in teacher experiences.

CONCLUSION

This study has successfully applied the SERVQUAL framework to diagnose service quality in Yemen's crisis-affected public schools, providing the first empirical evidence of how teachers perceive their daily service environment. The key findings, a systemic deficit in material and administrative reliability, contrasted with the relative preservation of interpersonal care and trust, and a significant disparity in service experience between basic and secondary education teachers collectively paint a picture of a system surviving through human resilience amidst institutional ruin. These insights move beyond documenting structural damage to reveal the functional inequities and adaptive strengths within the operational core of Yemen's schools. For recovery to be effective, interventions must be data-informed and multi-dimensional, simultaneously addressing the acute gaps in tangibles and reliability while leveraging the existing strengths in assurance and empathy, and must prioritize the neglected basic education sector. Ultimately, this research demonstrates that even in the most fragile contexts, service quality is a measurable, actionable concept, and its systematic assessment is a critical prerequisite for building back an education system that is not only standing but functioning with dignity and equity.

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