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Students' Perceived Service Quality of Polytechnic Colleges in the Regional State of Amhara, Ethiopia

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Abstract

The purpose of this study was to examine students' perceived Service Quality (SQ) and determine the quality of vocational education and training (VET) service delivery practices at polytechnic colleges (PCs) in the Amhara region using a descriptive survey design. The survey followed a contextually modified performance-only model with five SQ dimensions (tangibility, reliability, responsiveness, assurance, and empathy). Five colleges were randomly selected from 24. Quantitative data were collected from 896 systematically sampled students. One-sample t-test and one-way ANOVA were used to analyze the data. Results showed that mean scores for all SQ dimensions were below the test value of 3. Tangibility dimension scored the lowest ($M = 2.76$, $SD = 0.77$), while the responsiveness dimension was highest ($M = 2.93$, $SD = 0.77$), concluding that VET service delivery practices in all studied PCs need improvement. A significant gender difference was found in responsiveness, with female students ($M = 3.03$) rating it higher than males ($M = 2.80$), $t(894) = -4.25$, $p < 0.05$, $d = 0.28$. The results demonstrated that the quality of VET service delivery practices varies by students' field of study. A significant difference was also observed across colleges ($F = 6.97$, $p < 0.05$, $\eta^2 = 0.03$). These results have practical and policy implications, highlighting the need for policymakers and regulatory bodies to enhance the quality of VET service delivery practices in PCs within the study area.

Keywords: Perceived Service Quality, Quality of Service Delivery, Vocational Education

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1. Introduction

Competency-Based Education and Training (CBET) has become more well-known in Sub-Saharan Africa in the twenty-first century as a framework that synchronizes education with learning goals to meet the industry's constantly shifting labor market needs (Lawyer, 2021). Many nations have reformed their Technical and Vocational Education and Training (TVET) curricula, modifying the CBET approach to suit local capacities and situations (Misbah et al. 2019). Ethiopia is one of many nations that have implemented CBET to update its TVET curricula, tailoring the approach to local capacities and situations. The successful implementation of CBET depends on increasing the caliber and relevance of VET that help to produce well-qualified graduates with the necessary competence (Kufaine&Chitera, 2013).

Vocational schools then concentrate on enjoyable SQ factors, helping students develop the competencies that capture the actual needs of stakeholders (Galeeva, 2016; Raissi, 2018). However, the quality that might be related to problems with the Vocational Education and Training (VET) service delivery practices that inhibit students' achievement in their occupational competence assessment process is quite dissatisfying. As a result, TVET in the Amhara region has drawn the researcher's attention, as the low competency levels of TVET graduates were evident. For example, the region's final-year proceeding students' competency evaluation scores dropped from 62.5% in 2009to 42.8% in 2014 E..C as indicated in Table 1.

Examining students' perceived SQ is essential for enhancing VET quality, while Polytechnic Colleges (PCs) and other higher education institutions operate in a more competitive higher education market (Gonu et al., 2023; Gul et al., 2019; Usman & Mokhtar, 2016). One author asserted that a consistent and intentional effort is necessary to maintain high-quality service delivery practices (Abbas, 2020). Accordingly, the establishment of standards and the degree to which the provided quality service must satisfy the stakeholders' demands and specifications (Kandeepan et al., 2019; Twun& Peprah, 2020). In this regard, students, academic, and non-academic staff are considered the main stakeholders in higher education institutions; however, the "principal customers" are students (Abdullah, 2006a; Abdullah, 2006b; Hill, 1995). This suggests that assessing the quality of VET service delivery practices of PCs in the Amhara

region from students' perspectives will help to raise the standards and requirements for improved VET service provision in PCs, which will help to produce competent graduates.

In doing this, the scholars defined quality assurance in higher learning schools from the service consumers' standpoint to help students gain competence by leveraging instructional resources (input, process, and output) to help them satisfy their SQ threshold demand (Harvey & Green, 1993). The term " threshold" quality service refers to offering the required instructional resources that must be fulfilled by the service provider for service consumers recognized as providing high-quality services. Therefore, evaluating the perceptions of students in the Amhara region on the quality of VET service delivery practices by PCs was a primary focus of this study. This is because PCs should focus more on offering high-quality, practical-task-oriented VET service delivery practices to meet their students' competency needs, which enables them to achieve the stated objectives (Cuthbert, 1996).

This is for the reason that the nature of VET service delivery emphasizes applied skills over academic knowledge, focusing on practical rather than theoretical instruction (Oviawe, 2018). Therefore, if students are to achieve competent assessment results in their competency assessment and to be competitive in the labor market, high-quality VET services must be offered without compromising the provision of up-to-date instructional infrastructure and skilled human resource inputs (Islam & Himel, 2018).

Therefore, it was expected that PCs would fulfill SQ factors that aid in students' competence achievement, based on their capacity to supply skilled human and pertinent physical resource inputs in a way that produces competent graduates (Gasmelseed, 2021; Kigwilu& Akala, 2017; Maobe& Peng, 2020; Macharia et al., 2020). If PCs deliver quality VET services and produce competent graduates in this manner, graduates will acquire skills essential for the contemporary world of work (Lloyd, 2008).

However, even though the Ethiopian TVET system adopted the CBET approach in black and white, barriers have been faced practically in providing its quality VET service delivery practice, and graduates were incompetent for five consecutive years, as indicated in Table 1 that dissatisfaction with the quality service delivery is evident among TVET students, reflected by their low competency achievements. However, it is not studied separately from the students'

perspective using SQ factors. Local research works conducted from the service provider perspective revealed that ineffective practical trainers, outdated tools and equipment in workshops, and a lack of cooperation between cooperative training centers and TVET Colleges were among the limiting factors for CBET implementation to date (Kedir & Geleta, 2017; Melaku, 2018). Students may have failed to achieve their competency assessments because of the above-stated barriers in a college to offer quality VET service delivery practices. According to scholars, students' frustration in becoming proficient in their particular occupational fields of study is impeded by inadequate instructional infrastructure and limited resource inputs (Tegen, 2022).

Regarding the SQ study, academics recognized that service consumers (students) are "often more acutely aware of problems and more quickly aware of them" than service provider administrative teams or academic staff (Hoffman & Bateson, 2010; Hill, 1995, p. 73). Therefore, assessing SQ from students' perspectives is pivotal, and getting student participation is necessary to measure quality issues and identify gaps in an institution's service delivery practices (Ryan, 2015). However, very little, if any, study has been conducted from the perspective of students as primary consumers of services to address quality concerns that impede quality VET service delivery practices of PCs in the Amhara region.

To produce competent graduates, the CBET approach emphasizes learner-centered methods, with more practical training attachment, also known as workplace experience learning, as an essential element. In this context, it is contended that TVET focuses on applied practical skills rather than theoretical knowledge (Oviawe, 2018). This suggests that CBET implementation in TVET institutions has led to a paradigm shift in teaching and learning from the traditional knowledge-based approach to an outcome-based system to produce competent graduates. As a result, the CBET strategy is expected to be crucial for developing skilled graduates by providing students with high-quality VET services. To secure its benefits, the national TVET strategy was designed using the CBET approach (MoE, 2008). It has also been fortunate to be supported by the newly enacted educational policy (Ministry of Education [MoE], 2023).

However, TVET service delivery in the Amhara region was not carried out in conformity with the theoretical principles of the CBET approach as stated in the occupational standard framework. Because students were not able to achieve in their final year competency

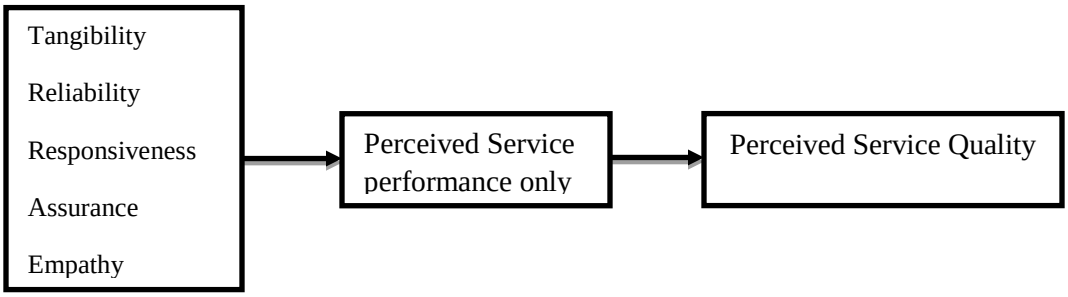
assessments. This suggests that quality VET service delivery practices determine the students' performance, which is important in ensuring excellent student achievements (Dhananjay, 2017; Islam & Himel, 2018). The incompetent results of students in their competency assessments in the study area are the actual evidence of the quality problem of the VET service delivery practices, and call for assessing the SQ of PCs from the students' perspective in the Amhara region.

Scholars like Abu Hasan et al. (2008), Aga, and Clemens et al. (2008) have generally concentrated on assessing SQ from the viewpoint of service customers [student]. Furthermore, Subrahmanyam (2017) and Austin and Pervais (2017) discovered that while quality has a direct correlation with student success in higher education institutions, perceived SQ also influences student performance, and is demanding to carry out the study. Accordingly, to assess quality, the three fundamentals—the physical settings, human elements, and process—should be regarded as quality determinants from the perspective of measurement criterion (Rueda et al., 2017). From the SQ conceptual framework point of view, the five main factors or SQ dimensions—tangibility, reliability, responsiveness, assurance, and empathy are applied to both human and physical resource inputs and processes (Parasuraman et al., 1988). This study adopted the five-factor or dimensions of the SERVPERF scale as the conceptual framework of the study (Cronin &Taylor, 1992). Although the SERVQUAL model is the most widely used conceptual framework for assessing SQ, it was criticized by scholars like Browne et al. (1993), Babakus and Boller (1992), and Teas (1993), who look at the need for developing a methodologically more precise scale.

Subsequently, the SERVPERF model is therefore cited as the superior option for measuring SQ in response to critiques of the SERVQUAL scale. It has gained significant support due to its empirically demonstrated superiority in explaining a larger variance in the overall SQ measured using a performance-only scale. The SERVPERF model also represents a significant improvement over the SERVQUAL model (Babakus& Boller, 1992; Boulding et al., 1993). Furthermore, researchers like Silva et al. (2017)contend that the SERVPERF scale is the best way to assess the validity, reliability, and methodological soundness of SQ. With such strengths, academics have therefore strongly endorsed the SERVPERF model as a conceptual framework for SQ assessment as the best alternative to the SERVQUAL model (Akdere et al.,

2020; Bolton & Drew, 1991). Moreover, comparisons of models by scholars confirmed that the SERVPERF scale had the best measuring capabilities and a useful measuring model for assessing SQ that requires less effort to modify the instruments for a particular setting, including higher education settings (Brochado, 2009; Carrillat et al., 2007). Therefore, the researcher used the modified SERVPERF model as the theoretical framework for this study because it is an experimentally sound theoretical model that may be used to measure SQ.

Service Quality Dimensions



Source: adapted from Cronin and Taylor(1992)

1.2. Statement of the problem

TVET has undergone a paradigm change toward the CBET approach, which aims to improve training quality and relevance by giving students the technology skills they need to succeed in the workplace and become globally competitive. To increase the quality and applicability of VET service delivery practices, both developed and developing countries have embraced outcome-based or CBET systems. The main characteristic of the CBET system is its focus on competencies rather than on subject matter knowledge, as was the case in the traditional supply-based TVET system. Thus, CBET is an approach to outcomes-based VET service delivery to students that prioritizes the competences required in the labor market… (Biemans et al., 2004; Smith, 2010). The aim of PCs in the study area is also to provide their students with quality VET that enables them to be competent for their future employment. However, the lack of flexible and self-directed task-oriented learning hinders competency acquisition, as highlighted in a study of TVET colleges in Ethiopia (Solomon, 2016).

Competency acquisition is the ability to use, apply, and exhibit knowledge, abilities, and attitudes to successfully carry out tasks and duties in the world of work. The students' competency must also be assessed in light of the specified job criteria for their certification. So,

before being certified to execute a standardized labor activity, a learner must pass a demanding competency assessment and verification process to demonstrate his/her proficiency. But, the quality of VET services offered by TVET institutions and the graduate competency achievements that industries demanded differ significantly from this point of view, according to research findings (Desalegn, 2018). This suggests that a significant gap exists in the necessary knowledge, skills, and attitudes offered to the students, as demonstrated by scholarly studies.

Furthermore, academics assert that the CBET approach emphasizes the development of students to be skilled graduates, so long as PCs are functioning as service providers are expected to offer high-quality VET services to have competent graduates (Kouwenhoven, 2009; Miseda&Kitainge, 2021; Wesselink, 2010). However, the research findings showed that there were problems with the quality of VET service delivery practices, such as poorly implemented practical workplace cooperative training, insufficient human and physical resource inputs and functional processes; and the absence of a transformational leadership style among TVET leaders (Endeshaw, 2014; Kedir, K., & Geleta, 2017; Mengistu, 2019; Mesfin & Van Niekerk, 2019; Mitiku, 2021). Furthermore, the successive decline in students' achievement over six years in their final-year competency assessment results in the study area was a clear sign of aproblem in the quality of VET service delivery practices.

Table 1. *Students' National Occupational Competency Assessment passing rate*

	Academic Years					
	2009 E.C	2010 E.C	2011 E.C	2012 E.C	2013 E.C	2014 E.C
Assessed students	8144	20707	43280	23222	45840	45438
Competent students	5090	10482	21571	10707	19936	19444
Competent rate in 100%	62.5	50.6	49.8	46	43.5	42.8

Source: Amhara National Regional State Occupational Competence Assessment and Certification Agency (2009 – 2014)

The persistent decline in students' competency accomplishment scores, from 62.5% in 2009 to 42.8% in 2014 E.C., suggests that TVET graduates are not yet competent and do not possess the necessary expertise that employers require in the world of work. Therefore, it makes logical sense to examine quality assurance practices that assist in more accurately assessing students'

competency demands by utilizing their presumptions on the essential VET service delivery practices provided by their respective PCs (Berry et al., 1994).This is because many scholars believe that research on the success or failure of the educational SQ has been more informative when the study focuses on the perspectives of active service users (students) (Mallya & Patwardhan, 2018; Nsamba &Makoe, 2017; Sardar et al., 2016). This suggests that the students' evaluation and feedback on higher education SQ is imperative to pinpoint an institution's strengths and/or weaknesses to identify major problem areas for improvement (Ryan, 2015). Hence, this study also contends that measuring the quality of VET service delivery practices is one of the key elements to ensure the quality of TVET institutions in general, and PCs in particular.

Therefore, the current study focused on the quality of VET service delivery practices of PCs in the study area from the students' view point. To meet this purpose statement, the following research questions spearheaded the entire research work:

1. To what extent do PCs in the study area provide quality VET service to their respective students along with the SQ dimensions?
2. Is there a significant difference among students' perceived SQ by their gender?
3. Are there significant differences among students' perceptions of the SQ by their occupational fields of study?
4. Is there a significant difference among study colleges in the quality of VET service delivery, as perceived by students?

2. Research Method and Design

Investigating how students in the Amhara region perceived the quality of PCs' VET service delivery practices was the main aim of this study. In doing so, it was guided by the positivist paradigm, which emphasizes quantitative methods to establish explanatory relationships and favors empirically based results from high sample sizes (Park et al., 2020).The research design used in this study was adescriptive design employed to describe the status of students' perceived service quality of VET service delivery practices of PCs in the Amhara region. As its name implies, descriptive survey research design answers primarily research questions and describes a sample/population (Creswell, 2014; Coe et al., 2017). The goal is to provide insight into the characteristics of the sample and to know the "why" behind the subjects.

2.1.Population, Sampling, and Sampling Techniques

A total of 3459 students who were attending their education and training in the 2023/24 academic year in the Amhara region made up the population from which the samples were drawn. One out of three metropolitan cities and four zones out of sixteen zone-specific districts were selected using a random sampling technique. Out of nine PCs in this area, five PC colleges were selected using the lottery method. Cochran's formula was applied to determine the total sample size of students (n), from the total population (N), at a confidence level (1-α) = 95%,withthe sampling error (e) =0.05,which is$no = \frac{t^2pq}{d^2}$is applied (Cochran, 1977). Thus, from the total of 3459 student population,1152 students were selected using the formula after ensuring proportionality to have a reasonable representative sample of respondents from each of the sample PCs (Kothari, 2004). The questionnaires were distributed to a total of 1152 students. Of these questionnaires, 200 were not returned, and 56 were wrongly filled out and discarded. In such a way, 896questions were correctly completed and used, yielding a 78% usable response rate become functional for the final analysis of this study.

2.2. Data Collection Instruments

The instrument, created by Parasuraman et al. (1988) and later refined by Cronin and Taylor (1992), was reviewed, contextually modified, and applied to gather data on VET service delivery practices of PCs in the study area. Before data collection, letters of consent and authorization were obtained from the relevant authorities at all levels. Using the data collected from 86 students chosen from different occupational fields of study at Bahir Dar Polytechnic College, which was not included in the main sample PCs, a pilot test was carried out to verify the validity and reliability, and eight experts were consulted for validity issues.

Consequently, as indicated below in Table 2.The reliability coefficients and shared variances regarding the convergent and discriminant validity values were found within the acceptable range of the assumptions. This is because all the values of CR > 0.70 and the values of AVE > 0.50 for both constructs (Christensen et al., 2020).

Besides, Lawshe's Content Validity Ratio (CVR) (Lawshe, 1975) was employed to determine the content validity (8 experts involved), of whom 7 responded that the instrument is relevant,

and the ratio for all the items was found to be greater than 0.75, which was acceptable to use in the actual data collection.

Table 2. *Correlation, Reliability, Convergent, and Discriminant Validity of Service Quality Constructs*

No	Construct	α	CR	AVE	MSV	MaxR	1	2	3	4	5
1	Reliability	0.76	0.795	0.766	0.566	0.727	1				
2	Assurance	0.74	0.864	0.897	0.487	0.754	.605**	1			
3	Empathy	0.69	0.798	0.677	0.587	0.736	.547**	.698**	1		
4	Responsiveness	0.76	0.788	0.891	0.634	0.822	.528**	.597**	.659**	1	
5	Tangibility	0.75	0.844	0.621	0.565	0.798	.444**	.533**	.561**	.604**	1

CR=Composite Reliability, AVE=Average Variance Extracted, MSV= Maximum Shared Variance.

Data Analysis Techniques

The data gathered using the questionnaire were analyzed using SPSS for Windows, version 27. The respondents' demographic information was analyzed using percentages. Based on the research questions, descriptive statistics (mean, SDs) and inferential statistics (one-sample t-test, and ANOVA) were used to describe students' perceived quality of VET service delivery practices of PCs in the study area and to determine the statistical significance differences between the sample means based on the expected test value (3.00).

Preliminary statistical analysis (e.g., reliability, validity), assumption testing (e.g., normality, linearity, coefficients of predictor variables, variances) were checked. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity were also checked. The KMO statistic value indicated aquite high index (0.905), which is above 0.5, and the significance value is 0.000 < 0.05, and the results indicated an index of 0.905, a "commendable" sign of adequacy for factor analysis (Tabachnick & Fidell, 2019). The results of Bartlett's test of sphericity as a whole were significant *(χ2 (df = 351, n = 896) = 1822.12, p < 001)*. Therefore, the overall findings signify that the data produced were reliable and valid to run further required statistical methods (Cohen et al., 2018).

1.1.Ethical Considerations

A letter of permission was obtained from the Department of Educational Planning and Management to collect the data. Then, using a permission letter for collecting data from the sample PCs of the Amhara region was properly followed. Besides, participants of the study

were informed that the general objective of the study was simply for academic research purposes, and their responses would be used for such research purposes only; the confidentiality of the data would prevail, and the research result would hopefully be reported honestly. Consent documents outlining the goals, possible advantages, and dangers of the study were given out.

The gathered data was meticulously documented and presented in an unbiased manner. Any ideas that were borrowed were properly attributed while following the relevant citation guidelines

2. Results of the Study

2.1.Demographic Characteristics of Respondents

Twenty-seven valid questionnaires items, categorized under five SQ dimensions (tangibility, assurance, responsiveness, reliability, and empathy), were answered by 896 students. Among the respondents, 381 (42.53%) were male, and 515 (57.47%) were female. These responses were utilized in the final analysis of the study. The respondents' levels of study included 678 (75.7%) at Level V, 124 (13.8%) at Level IV, and 94 (10.5%) at Level III. The respondents' fields of study included Information Communication Technology (ICT), Garment, Auto Mechanic, Electrical/Electronic Communication, and Metal Manufacturing.

Regardingresponse rates, some authors provide ranges based on the field of study. For example, in management, scholars reported the return rates of 60%, 70%, 80%, and 90% as marginal, reasonable, good, and excellent, respectively (Gordon et al., 2002). Thus, in this regard, it is considered a matter of academic integrity to overtly mention that 78% of usable questionnaires, close to excellent, were used in the current study as the relevant return rate.

2.2.Students' Perceived SQ Practice of Polytechnic Colleges

Students were asked to rate the items on a scale from 1, representing very low quality, to 5, representing very high quality, regarding their level of agreement with the extent to which the quality of VET service delivery was practiced in the PCs, in terms of the service quality dimensions of tangibility, reliability, responsiveness, assurance, and empathy. Accordingly, students' perceived quality of VET service delivery practice of PCs within each SQ dimension was calculated as the difference between the sample mean and expected mean (set at 3.00).

For analysis purposes, mean scores ranging from 1.00 to 2.5 were classified as very low and low; means within the rangeof2.51 to 3.5 were considered moderate; means from 3.51 to 4.5 were categorized as high; and sample means greater than 4.51 were classified as very high. Additionally, the conforming effect size was utilized to address the statistical restrictions recommended by Cohen et al. (2018), referred to as Cohen's d. The reported values of Cohen's d = .80, .50, and .20 are interpreted as large, medium, and small effects, respectively. Specified that as revealed in Table 3 the sample mean scores for tangibility (M=2.76; SD=.77), empathy (M=2.77; SD=.88), assurance (M=2.83; SD=.76), responsiveness (M=2.93; SD=0.77), and for reliability (M=2.89; SD=.78) were all close to round the test score (test value=3.00), but they were lower than the expected test score (3) and significantly different from the expected mean. Specifically, for responsiveness (t (895) = -2.301, p =.022, d=0.08), reliability (t (895) = -3.984, p =.000, d=0.13), assurance (t (895) = -6.501, p =.000, d=0.21), empathy (t (895) = -7.560, p =.000, d=0.25), and tangibility (t (895) = -9.249, p =.000, d=0.29), the findings showed statistically significant mean difference.

Given that the overall sample mean score of SQ (M=2.84; SD=.65) was found to be close to the test score and the one-sample significant test result (t (895) = -7.31, p =.000, d = 0.23), statistically significant mean differences were revealed. The comparable effect sizes for reliability and responsiveness were small, suggesting that the current practical mean difference is not meaningful.

However, the effect sizes for tangibility, assurance, empathy, and the overall SQ were small.

This indicates that, to some extent, the mean differences between the expected test score (3) and the sample means for these dimensions and the overall quality of VET service delivery practice appeared to be both moderate and practically meaningful.

Table 3. *One-Sample t-test on students' perceived quality of VET service delivery (N= 896)*

	Test Value = 3						
SQ Domains	Mean	SD	MD	t	df	P	Cohen's d
Tangibility	2.76	.77	-.23	-9.249	895	.000	.29
Reliability	2.89	.78	-.10	-3.984	895	.000	.13
Responsiveness	2.93	.79	-.06	-2.301	895	.022	.08
Assurance	2.83	.76	-.16	-6.501	895	.000	.21
Empathy	2.77	.88	-.22	-7.560	895	.000	.25
Total SQ	2.84	.65	-.15	-7.313	895	.000	.23

SD- Standard Deviation MD = Mean Difference

2.3.Students' Perceived SQ Differences by Gender

The basic research question was raised that students' perceptions of service quality might vary by gender. An independent samples test was conducted to test this suggestion (at the 0.05 alpha level, two-tailed).The study focused on testing whether the means from three normal distributions are equal. Following the recommendations of Bancroft (1964) and Huber (1972) that the level of a preliminary test should be greater than 5%, a level of 15% is used here. As specified in Table 3, Levene's test for equality of variances revealed that the assumption of homogeneity was met for some dimensions (tangibility, reliability, responsiveness, assurance, and empathy).In light of this, the assumption of equal variance was chosen over the others, as the significance values were > 0.05 for tangibility, reliability, and empathy.

The mean scores for male students' perception of responsiveness (M=2.80; SD=.78) and for female students (M=3.03; SD=.78) were found to be statistically and significantly different (t (894) = -4.247, p< 0.05; d=.28), indicating that female students had a more positive perception compared to their male counterparts. Similarly, the mean scores for students' perceptions of assurance for males (M=2.74; SD=.76) and females (M=2.89; SD=.75) were statistically significant (t (894) = -2.880, p< 0.05; d=.18) with the same pattern, showing that females perceived service quality more favorably than males. Regarding the strength of the mean difference, Cohen's d values suggested that the mean difference between male and female perceptions in the responsiveness dimension was practically medium, whereas the strength of the mean difference for assurance appeared small. Similarly, the mean scores for students'

perceptions of assurance for males (M=2.74; SD=.76) and females (M=2.89; SD=.75) were statistically significant (t (894) = -2.880, p< 0.05; d=.18) with the same pattern, showing that females perceived service quality more favorably than males. Regarding the strength of the mean difference, Cohen's d values suggested that the mean difference between male and female perceptions in the responsiveness dimension was practically medium, while the strength of the mean difference for assurance appeared small.

Table 4. *Independent Sample t-test on students' perceived SQ Differences by gender (N=896)*

Dimensions	sex	M	SD		Levene's Test for Equality of Variances		t-test for Equality of Means			
				Assumptions	F	Sig.	t	df	Sig. (2-tailed)	Cohen's d
Tangibility	M	2.62	.76	Equal variances	.113	.737	-4.513	894	.000	.305
	F	2.85	.76	assumed			-4.516	820.745	.000	
Reliability	M	2.75	.78	Equal variances	.682	.409	-4.871	894	.000	.326
	F	3.00	.75	assumed			-4.846	802.951	.000	
responsiveness	M	2.80	.78	Equal variances	.015	.904	-4.242	894	.000	.287
	F	3.03	.78	not assumed			-4.247	822.524	.000	
Assurance	M	2.74	.76	Equal variances	.005	.943	-2.885	894	.004	.195
	F	2.89	.75	not assumed			-2.880	813.183	.004	
Empathy	M	2.64	.86	Equal variances	.327	.567	-3.777	894	.000	.255
	F	2.87	.89	assumed			-3.794	832.456	.000	

M = Mean, SD = Standard Deviation, MD = Mean Difference

2.4. Students perceived SQ Differences by their occupational field of study

After students perceived SQ of VET service delivery in PCs was determined, a one-way ANOVA (at 0.05 alpha level of significance, 2-tailed) was employed to examine students' perceived SQ differences in their occupational field of study (Information Communication Technology (ICT), Garment, Auto Mechanic, Electrical /Electronic Communication, and metal manufacturing. In this case, the ANOVA result suggested that students' perceived quality of VET service delivery practices along diverse fields of study was statistically significant for all specified dimensions. That is, the ANOVA result for tangibility (F= 10.852; df =4, 891; p<0.05, η^2 = 0.05); reliability (F= 12.594; df =4, 891; p<0.05, η^2 =0.05); responsiveness (F= 10.682; df =4, 891; p<0.05, η^2 =0.05); assurance (F= 8.975; df =4, 891; p<0.05, η^2 =0.04) and empathy (F= 7.550; df =4, 891; p<0.05, η^2 =0.03) were all found statistically significant. This implies that the

occupational field of study among students created significant differences in their perceptions of the SQ offered by their respective PCs. However, effect sizes ($\eta 2$) were small, implying that the MDs did not appear practically meaningful.

Table 5.*ANOVA Result about students' perceived SQ differences by their field of studies (N=896)*

SQ Dimensions		Sum of Squares	df	Mean Square	F	Sig.	η^2
Tangibility	Between Groups	25.027	4	6.257	10.852	.000	0.05
	Within Groups	513.719	891	.577			
	Total	538.746	895				
Reliability	Between Groups	29.166	4	7.291	12.594	.000	0.05
	Within Groups	515.840	891	.579			
	Total	545.005	895				
Responsiveness	Between Groups	25.699	4	6.425	10.682	.000	0.05
	Within Groups	535.899	891	.601			
	Total	561.598	895				
Assurance	Between Groups	20.150	4	5.038	8.975	.000	0.04
	Within Groups	500.123	891	.561			
	Total	520.273	895				
Empathy	Between Groups	23.150	4	5.788	7.550	.000	0.03
	Within Groups	683.010	891	.767			
	Total	706.160	895				

Further post-hoc analysis, Tukey HSD ("honestly significant difference" or "honestly significant difference") was applied to examine where exactly the MDs exist in that regard. This is because the Tukey HSD post hoc test is the most widely chosen statistical tool used to determine if the relationship between two sets of data is statistically significant (Benjamin & John, 2002). Thus, students with varied occupational fields of study showed a perception mean difference, as shown in Table 6.

Table 6. ANOVA result on Students' Perception Differences in terms of occupation

SQ Dimensions	(I) occupation	(J) occupation	Mean Difference (I-J)	Sig.
Tangibility	ICT	Garment	.32995*	.003
		Electronics	.41906*	.000
	Auto mechanic	Electronics	.24502*	.020
Reliability	ICT	Auto mechanic	.23812*	.004
		Electronics	.41767*	.000
		Metal manufacturing	.52011*	.000
	Garment	Electronics	.28800*	.038
		Metal manufacturing	.39043*	.046
		Garment	-.39043*	.046
Responsiveness	ICT	Auto Mechanic	.25046*	.003
		Electronics	.32448*	.000
		Metal Manufacturing	.60505*	.000
	Garment	Metal manufacturing	.45878*	.013
	Metal manufacturing	Auto Mechanic	-.35459*	.048
		Electronics	-.28057	.194
Assurance	ICT	auto Mechanic	.25462*	.001
		Electronics	.36312*	.000
Empathy	ICT	Auto Mechanics	.34791*	.000
		Electronics	.27379*	.005
		Metal manufacturing	.45523*	.009
Total SQ	ICT	Auto Mechanic	.25312*	.000
		Electronics	.35957*	.000
		metal Manufacturing	.42098*	.000

*The mean difference is significant at the 0.05 level.

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Students from the ICT and garment occupational field studies had better SQ perceptions of the reliability dimension than those from other occupational fields, according to the perception differences. In a similar vein, students whose occupational field studies were auto mechanics were perceived more favorably than those who worked with electronics. Students studying ICT, garment, and metal manufacturing had considerably different perceptions of the responsiveness dimension than those who studied Auto mechanics, electrical/electronics, and metal manufacturing, with the former group scoring higher. When comparing students' perceived SQ in other occupational fields of study, students who studied ICT seemed to have better views of

assurance and empathy. Therefore, students of ICT had a higher perception of SQ than students who studied in auto mechanics, electronics, or metal manufacturing. In light of the results gained, it seemed possible to confirm that students' perceived SQ of PCs differ due to differences in students' fields of study.

3.5 Students' Perceived SQ Differences Among Different Study Colleges

The differences in students' perceptions of the quality of VET service delivery by their respective colleges where they were studying (Burie, Debre Tabor, Debre Markos, W/roSihin, & Debre Birhan) were examined using a one-way ANOVA (at 0.05 alpha level of significance, 2-tailed).

As a result, the ANOVA result showed that, for each of the designated domains, students' total perception of students from Debre Markos, Burie, and Debre Birhan was found to be better when compared to others. perceptions of the SQ procedures and practices across colleges were statistically significant. Accordingly, the following results were found to be significant: tangibility ($F=5.738$; df =4, 891; $p<0.05$, $\eta 2 = 0.03$), reliability ($F= 6.964$; df =4, 891; $p<0.05$, $\eta 2 =0.03$), responsibility ($F=6.579$; df =4, 891; $p<0.05$, $\eta 2 =0.03$), assurance ($F= 4.510$; df =4, 891; $p<0.05$, $\eta\ 2 =0.02$), and empathy ($F= 3.552$; df =4, 891; $p<0.05$, $\eta\ 2 =0.02$). Similarly, there was a significant difference in the overall perceived mean on SQ along colleges ($F= 6.96952$; df =4, 891; $p<0.05$, $\eta\ 2 =0.03$). This suggests that there were notable variations in the quality of VET service among the PCs where students were enrolled. However, the effect sizes ($\eta\ 2$), were determined to be smaller, suggesting that the MDs did not appear to have any practical implication.

Table 7. *ANOVA Result about students' perceived SQ across colleges (N=896)*

		Sum of Squares	Df	Mean Square	F	Sig.	η^2
Tangibility	Between Groups	13.530	4	3.383	5.738	.000	0.03
	Within Groups	525.215	891	.589			
	Total	538.746	895				
Reliability	Between Groups	16.522	4	4.130	6.964	.000	0.03
	Within Groups	528.483	891	.593			
	Total	545.005	895				
Responsibility	Between Groups	16.111	4	4.028	6.579	.000	0.03
	Within Groups	545.486	891	.612			
	Total	561.598	895				
Assurance	Between Groups	10.325	4	2.581	4.510	.001	0.02

	Within Groups	509.948	891	.572			
	Total	520.273	895				
Empathy	Between Groups	11.083	4	2.771	3.552	.007	0.02
	Within Groups	695.076	891	.780			
	Total	706.160	895				
Total SQ	Between Groups	11.476	4	2.869	6.969	.000	0.03
	Within Groups	366.807	891	.412			
	Total	378.283	895				

Further post-hoc analysis was carried out to identify where exactly the MDs exist along each of the SQ dimensions examined in the study (see Table 7). Indeed, the Tukey HSD was applied to examine the mean differences across the colleges. As shown in the table, students from different colleges exhibited a notable difference in their perception means. Yet, the differences in some colleges continued to be weak. In light of that, students from Burnie Polytechnic College seemed to perceive all the SQ dimensions better than students from the rest of the Polytechnic colleges. Besides, students from Debre Tabor and W/ro Sihin perceived the responsiveness dimension better than Debre Birhan students.

Table 8. *Multiple Comparison tests of students' perceived SQ across colleges*

Post-Hoc On-Perception Differences of SQ among Trainees Across Colleges

Dimensions	(I) College	(J) College	MDs (I-J)	Sig.
Tangibility	Burie	Debre tabor	.28034*	.020
		W/roSihin	.28392*	.001
Reliability	Burie	W/roSihin	.28260*	.001
		Debre Birhan	.45709*	.001
Responsibility	Burie	Debre Markos	.22245*	.025
		Debre Birhan	.54239*	.000
	Debre tabor	Debre Birhan	.45878*	.014
	W/roSihin	Debre Birhan	.39109*	.028
		Debre tabor	-.45878*	.014
Assurance	Burie	Debre Markos	.19927*	.046
		W/roSihin	.24970*	.004
Empathy	Burie	Debre Markos	.23810*	.039
		Debre Birhan	.38064*	.046
	Debre Markos	Burie	-.23810*	.039
Total SQ	Burie	Debre tabor	.11531	.561
		Debre Markos	.20282*	.008

	W/roSihin	.22004*	.002
	Debre Birhan	.35942*	.003
W/roSihin	Burie	-.22004*	.002
	Debre tabor	-.10473	.758
	Debre Markos	-.01722	.999
	Debre Birhan	.13938	.705

**The mean difference is a significant levelof 0.0*

3. **Discussion**

Since they have needs that must be satisfied by relevant and high-quality VET services that aid in the progress of pertinent competencies, students are considered the primary customers of any education and training institutions globally (Adenuga & Ayodele, 2012; Nek et al., 2010). Similarly, Zhu and Sharp (2022) described the students as the "principal customers" in higher education and emphasized that quality should be analyzed based on student views.

Thus, this study looked at the extent to which PCs in the study area provide quality VET service to their respective students end-to-end with the SQ dimensions. Consequently, students' perceived quality of VET service delivery practices of PCs in the study area was assessed along the specific SQ dimensions (tangibility, reliability, responsiveness, assurance, and empathy). The findings of the study revealed that all of the sample means for each SQ dimension and the overall SQ appeared to be getting close to the test score (3), ranging from the lowest mean score for tangibility (M=2.76; SD=.77) and comparatively the highest mean score for responsiveness (M=2.93; SD=0.77), but in all SQ dimensions and the overall SQ appeared to be below test score (3) implying that quality of VET service delivery practices of PCs in the study area was moderate that needs improvement. Consistent with this study, Kinker et al., (2023), in their case study of SQ in polytechnic education institutes of Madhya Pradesh in India, have been reported that there was significant difference between rendered SQ and expectations of students that need improvement in the SQ factors such as academic excellence, library, infrastructure, career counseling, etc. Similarly, Alemu (2023) in his study of SQ of Madda Walabu University observed that students' perception of the tangible dimension had the lowest mean score (−1.79). In contrast to findings in this study, Makinde and Bamiro (2022), in their study of SQ of TVET and Students' Performance in the Federal Polytechnic Ilaro, Nigeria, concluded that students are experiencing SQ of TVET in all five SQ dimensions. Therefore, PCs in the Amhara region need to pay attention

to the quality of their VET service delivery along with five dimensions, particularly to the tangibles dimension, in particular and ensure that planned requirements like the physical infrastructural set-ups and modern types of equipment align with the service promises.

The other issue examined in this study was perceived SQ differences by gender. Accordingly, as specified in Table 3, Levene's test for equality of variances revealed that the assumption of homogeneity was not met for some dimensions (tangibility, reliability, and empathy), whereas the assumption was met for the responsiveness and assurance dimensions. In light of this, the assumption of equal variance was chosen over the others, as the significance values were greater than 0.05 for tangibility, reliability, and empathy. Therefore, there were no significant MDs between male and female students perceived quality of VET service delivery practices in these dimensions. But, the mean scores for male students' perceived quality of VET service delivery practices of responsiveness SQ dimension and for female students were found to be statistically and significantly different ($t(894) = -4.247$, $p < 0.05$; $d=.28$), indicating that female students had a more positive perception for responsiveness SQ dimension compared to their male counterparts.

Regarding students' perceived SQ differences by their occupational field of studies, a one-way ANOVA (at 0.05 alpha level of significance, 2-tailed),result suggested that perceived quality of VET service delivery practices along their occupations ICT, Garment, Auto mechanic, electrical/electronics, and metal manufacturing) were statistically and significantly different for all specified SQ dimensions. However, to identify the exact location of the obtained MDs along each of the SQ dimensions examined in the study, further post-hoc analysis was carried out. Therefore, students of ICT had a higher perception of SQ than students who were in auto mechanics, electrical/electronics, or metal manufacturing. In light of the results obtained, it seemed possible to confirm that students' perceptions of quality of VET service delivery practices of PCs differ due to differences in students' occupational fields of study.

Students' perceived quality of VET service delivery practices differences among different study PCs were also investigated. In this regard, A one-way ANOVA result showed that, for each of the designated SQ dimension, students' perceived quality of VET service delivery procedures and practices across PCs were statistically significant. There was a significant difference in the overall perceived mean on quality of VET service delivery practices and procedures across colleges ($F= 6.96952$; $df =4, 891$; $p<0.05$, $\eta\ 2 =0.03$). This suggests that there were notable

variations in the perceived quality of VET service delivery practices among the colleges where students were enrolled. The effect sizes (η 2), however, were found to be small, suggesting that the MDs did not appear to have any practical implications. To identify the exact location of the obtained MDs along each of the SQ dimensions, a post-hoc analysis was carried out. As a result, students from different colleges exhibited a notable difference in their perception means. In light of that, students from Burnie Polytechnic College seemed to perceive all the SQ dimensions better than students from the rest of the Polytechnic colleges. Besides, students from Debre Tabor and W/roSihin perceived the responsiveness dimension better than Debre Birhan students. The total perception of students from Debre Markos, Burie, and Debre Birhan was found to be better than that perception when compared to others.

1. Conclusion

According to the findings of this study, the perceived quality of VET service delivery practices at PCs in the Amhara region, Ethiopia, appears inadequate across all measured SQ dimensions or factors that require improvement. Extending from the lowest mean score in the tangibility SQ dimension to the relatively highest mean score in responsiveness, overall SQ in all dimensions fell below the test score of 3. This implies that the quality of VET service delivery practices at PCs in the study area needs major enhancement, particularly in the tangible dimension- physical facilities, availability, and up-to-date level of tools and equipment, and appearance of personnel. Another issue examined in this study was the perceived SQ differences based on gender. From the preceding discussion, it can be concluded that gender factors do not significantly impact VET students' attitudes and opinions regarding the quality of VET service they receive from their colleges.

Concerning students perceived SQ differences by their occupational field of studies, it seemed possible to confirm that students' perceptions of the quality of VET service delivery practices of PCs differ due to differences in students' occupational fields of study. Likewise, students from different study colleges have exhibited a notable difference in their mean perception scores of SQ. In light of that, students from Burnie PC seemed to perceive all the SQ dimensions better than students from the rest of the PCs. Besides, students from Debre Tabor and W/roSihinPCs perceived the responsiveness dimension better than Debre Birhan PC students. The total SQ perception of students from Debre Markos, Burie, and Debre Birhan was found to be better thanthat perception when compared to others.

2. Recommendation

The students' perceptions concerning all the SQ dimensions have a mean score of below 3, which is less than the middle score when using the five-point Likert scales. This means that the students, as service consumers, were dissatisfied with the service quality at the PCs. Thus, based on study findings, the researcher makes the following recommendations: (i) PCs should identify those dimensions of VET quality factors, particularly the tangibility dimension (physical appearance of the facilities, communication material, tools, and machines),which were rated the lowest, and need to be more focused for improvement of all the tangible aspects. (ii) PCs should implement properly the industry-agreed competency standards during VET service delivery practice to help students become competent. (iii) Technology studies should be conducted in a well-equipped workshop in collaboration with government bodies and students' engagement has to be devoted to hands-on VET practices.(iv) PCs should continuously measure students' experience of VET practical activities to maintain the high standard identified presently in a school.

(v)Instead of establishing new TVET institutes, the government must put a lot of effort into addressing the difficulties that arise from insufficient resources to implement CBT. Maintaining the quality of VET service delivery in the study region will address the issue of maintaining the quality of VET service delivery in the study area.

7. Directions for future research

This was the first study to assess the perceptions and service quality factors influencing the quality of VET service delivery practice in PCs of the study area from the viewpoint of students in the Amhara region, Ethiopia. Research based on students' competency-based training principles is needed, specifically to help develop better strategies to improve the quality level of VET service delivery.

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