Assessing the Quality of an Online Learning Platform for Vocational Training in Skills-Based E-Learning: A Trainee's Perspective Using Importance and Performance Analysis at Jazan Technical Colleges

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Abstract: Due to the increased need for online technical and vocational education and training (TVET) in recent years, many technical colleges rushed to adopt online training to restart the educational process during the COVID-19 pandemic. The lack of experience in the field of online technical training in some universities and colleges has made it difficult for them to adapt training methods to meet online demand. We wanted to measure how trainees perceive the quality of online technical training services, as customer satisfaction is always associated with customer retention and pursuit of future purchases, and to employ the learned skills of the trainees well. In this study, the perceived quality of online training opportunities in TVET at Jazan Technical Colleges was measured, and a modified performance model, SERVPERF, was used to measure service quality. This study provides important insights for TVET and makes you more focused on marketing plans by prioritizing investments in trainee empowerment. Recognize the quality of online learning opportunities in vocational training. Using importance–performance analysis, this study identifies the exact areas of improvement and prioritizes them. More support is needed through vocational training. This study is a simple and inexpensive approach to enhance vocational training commitment to assess service quality and achieve student satisfaction.

Keywords: Online Learning, SERVPERF, SERVQUAL, TVET.

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1 Introduction

The outbreak of COVID-19 forced educational institutions worldwide to adopt remote learning, which has great potential and can be highly beneficial if used effectively. However, some argue that this approach is at odds with Arab culture, which values social closeness and intimacy. In addition, the educational system is facing significant changes brought about by the fourth industrial revolution, which differs from its predecessor in terms of its strength, breadth, and impact. Educational institutions must design suitable programs and curricula that match the new environment, taking into account various factors that shape the learning experience. The challenges faced by educational institutions include limited and inefficient resources, outdated teaching styles, inadequate infrastructure, and a lack of close linkages among institutions. To prepare students for the future, educators must develop methods and strategies that ensure both quantitative and qualitative learning. The educational system must adapt to these changes and equip students with the skills they need to thrive in the future, as the job market is predicted to undergo significant changes over the next decade.

2 Literature Review

Online learning platforms have become increasingly popular in recent years, especially in the context of vocational training and skills-based e-learning. The quality of these platforms has become a critical factor in determining the effectiveness and success of online learning programs. In this literature review, we focus on research studies that have investigated the quality of online learning platforms for vocational training from a trainee's perspective using importance–performance analysis (IPA) as well as other service quality measurement models.

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One of the key factors that influence the quality of an online learning platform is the usability of the platform. According to Mwangi and Mbataru (2018), the usability of an e-learning platform is critical in ensuring that learners can easily navigate and access learning resources. They found that learners perceive usability as an essential factor in determining the quality of an e-learning platform. Similarly, Wai and Chu (2017) found that usability and ease of use are crucial factors in determining the success of online learning platforms.

In the findings of Joo and Lim (2019), the quality of learning materials is a crucial factor in determining the effectiveness of e-learning platforms. They found that high-quality learning materials positively influence learners' engagement and motivation to learn. Similarly, Lee and Lee (2018) found that the quality of the learning materials provided by an e-learning platform significantly influences learners' satisfaction and the perceived usefulness of the platform.

According to Rovai and Downey (2010), learner support plays a crucial role in facilitating learner engagement and success in online learning programs. They found that learner support can positively impact learners' motivation, satisfaction, and academic performance. Similarly, Zhang and Han (2016) found that effective learner support positively influences learners' perceived learning outcomes and overall satisfaction with the e-learning platform.

Service quality measurement is essential for preserving operational effectiveness and enhancing business performance (Mehta, 2000). It is considered a crucial element for service providers' success because raising the quality of the provided services increases client satisfaction (Parasuraman et al., 1985; Chow et al., 2007). Working to boost customer satisfaction results in client retention, a larger portion of the market, and more profits (Luo, 2007). Technical and vocational education and training (TVET) can use service quality measurement tools to improve their programs and attract trainees. Trainees' choice of educational institution is based on their perception of the quality of the services provided (Donaldson & O'Toole, 2004; Hashim, 2011).

Several models have been developed for measuring service quality, such as the Gronroos model (Gronroos, 1988), the Gaps model (Oliver, 1980; Parasuraman et al., 1985), the SERVQUAL model (Parasuraman et al., 1988), the SERVPERF model (Cronin & Taylor, 1992), and IPA (Ford, 1999).

The Gronroos model (Gronroos, 1988) can be described as technical/functional service quality (what/how). It is a combination of what the customer purchased and how the service was delivered to them. This model focuses on the "how" to achieve success. See Figure 1.
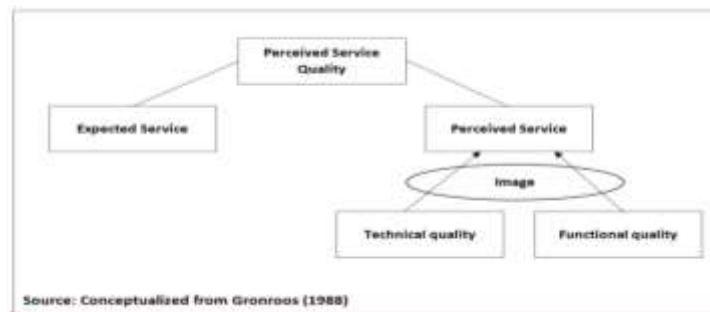

Fig. 1: The Gronroos model.

2.1 The Gaps Model (Oliver, 1980; Parasuraman, 1985)

According to this paradigm, client evaluations of the service based on expectations and perceptions are what determine service quality. The difference in perceptions and expectations relates to the level of service. If the perceived quality is lower than anticipated, the gap could be either positive or negative. This model consists of five significant satisfaction gaps that must be closed by the business in order to satisfy the client. These gaps include:

1. **The knowledge gap**: the difference between what customers expected and what was delivered.
2. **The policy gap**: the difference between managers' understanding of customer needs and their translation of that understanding into policies and procedures for service delivery.
3. **The delivery gap**: the difference between service delivery policies and the actual service delivery.
4. **The communication gap**: the difference between what a firm promised to do for customers and what customers received.

5. **The customer gap**: the difference between customer and customer expectations and perceptions. By closing the first four gaps, the customer gap is also closed. See Figure 2.
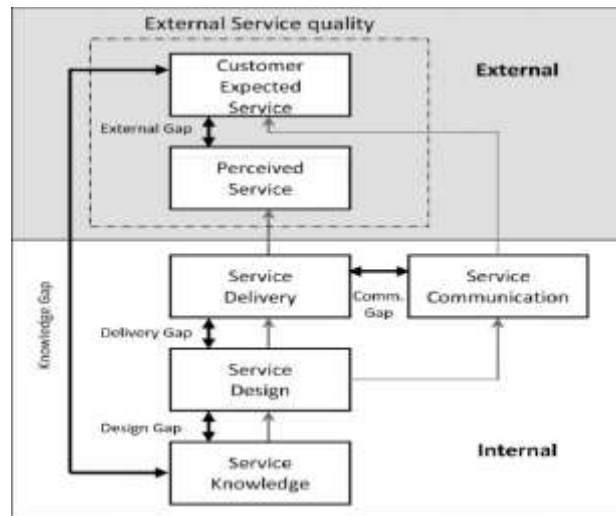

Fig. 2: *The Gaps model*

2.2 The SERVQUAL Model (Parasuraman, 1985; Parasuraman, 1988)

SERVQUAL is the most used tool to measure service quality. It came from further development of the Gaps model. SERVQUAL is an essential component in banking (Buttle, 1996). Parasuraman (1985) conceptualized and suggested this model, and it was then further explored for the following eight years by academics. As a result, SERVQUAL "has clearly had a considerable impact on the corporate and academic sectors" (Buttle, 1996) and has been described as "insightful and a practical framework to apply in service quality management" (Christopher, 2002). The SERVQUAL model is a popular tool for measuring service quality, particularly in banking. It consists of 22 items divided into five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. Expectations and perceptions are assessed separately, and the quality gap is calculated using Equation (1):

$$P\text{-}E = Q \qquad (1)$$

The sum of all Q values yields a total quality rating for a customer. This model can be used to follow service quality trends, compare businesses to their competitors, and classify customers into perceived quality segments. The 10 components of service quality identified in earlier studies were grouped into the five dimensions of reliability, tangibility, empathy, responsiveness, and assurance. The components of the SERVQUAL method are illustrated in Figure 3.
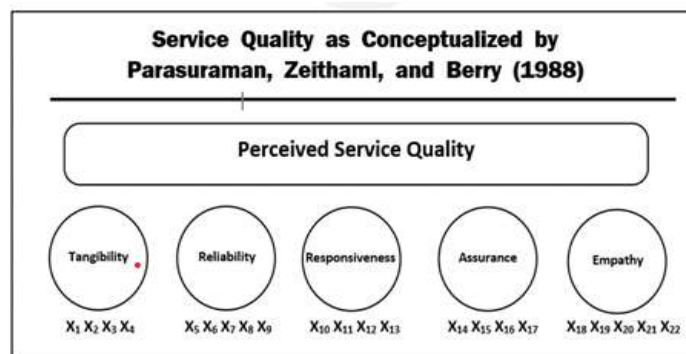

Fig. 3: The SERVQUAL method.

2.3 The SERVPERF Model (Cronin, 1992)

This literature review highlights the development as well as criticism of the SERVQUAL model (shown in Table 1), with many authors agreeing that performance-based metrics explain more variance in overall service quality measurement than SERVQUAL and other scales. Studies have shown that SERVPERF, a performance-only measure of service quality, delivers more reliable estimates, explains more variance, and is less biased than SERVQUAL. Cronin and Taylor (1992) proposed SERVPERF as a more precise way of measuring service quality, arguing that there is little theoretical or empirical evidence to justify the equation E-P=Q as a basis for assessing service quality. Their research, which was later replicated, provided empirical evidence across four industries to support the superiority of their SERVPERF scale over SERVQUAL. In this literature review, various references have been cited, including Oliver (1989), Bolton (1991), Cronin (1992), Boulding (1993), and Parasuraman et al. (1985, 1988), in support of these arguments. The SERVPERF service quality can be expressed using Equation (2):

$$SQ_i = \sum_{j=1}^{k} P_{ij} \qquad\qquad (2)$$

Where:
SQ_i = **Perceived service quality for an individual "i"**
k = **Number of attributes/items**, which equals 22
P_{ij} = **Perception of an individual "i"** about the performance of a service

Table 1: SERVQUAL items.

Summary of SERVQUAL Items		
Dimension	No. of Items in Questionnaire	Definition
Reliability	5	Ability to reliably and accurately perform promised services
Assurance	4	Knowledge and courtesy of staff and ability to instill trust
Tangibles	4	Appearance of physical facilities, equipment, personnel, and communication materials
Empathy	5	Providing compassionate and personalized customer care
Responsiveness	4	Willingness to support customers and provide prompt service

2.4 Importance–Performance Analysis (IPA)

Finally, the IPA approach has been widely used to assess the quality of online learning platforms from a trainee's perspective. According to Abdous et al. (2012), IPA provides a comprehensive and systematic way to identify the critical factors that influence learners' satisfaction with e-learning platforms. They found that IPA can effectively identify the areas of improvement and prioritize the development of e-learning platforms.

3 Methodologies

To assess the service quality of online technical training in technical colleges, a questionnaire consisting of 22 item statements representing items related to the five dimensions of service quality in the SERVPERF model was conducted. For each item, the student (client) was asked to express their feelings about the importance of each item in their decision-making regarding online technical training and their perception of the quality of the services provided by technical colleges.

Three general questions about future interest behavior, overall quality, and satisfaction were added at the end of the questionnaire. The item phrases used to measure the performance and importance of online service quality in technical colleges are shown in Table 2.

To use a modified SERVPERF method (weighted SERVPERF), the importance of each item statement from the questionnaire is collected to perform an IPA. Service quality (SQ) is calculated by multiplying the weights by the awareness score, as shown in Equation (3):

$$SQ_i = \sum_{j=1}^{k} W_{ij} \cdot P_{ij} \qquad (3)$$

Where:
SQ_i = *the service quality of an individual "i"*
P_{ij} = *the perception score of item statement "j" to an individual "i"*
W_{ij} = *the weighting factor of item statement "i" to an individual "i"*

The weighting factor is the normalized importance score calculated from Equation (4):

$$W_{ij} = \frac{I_{ij} - Min}{Max - Min} \qquad (4)$$

Where:
I_{ij} = *the importance of item statement "j" to an individual "i" taken from the questionnaire.*
Min *and* Max *are the minimum and the maximum importance scores of item statement "j", respectively.*

Table 2: Dimensions and item statements of SERVPERF.

Dimensions	Item Statement
Tangibility (4 items)	Q1: Technical colleges have modern online training tools. Q2: The tools used in online technical training are visually appealing. Q3: Faculty members dress neatly and elegantly in online lectures. Q4: Online technical skills training tools seem to be compatible with the type of service provided.
Reliability (5 items)	Q5: When technical colleges promise something at a certain point in time, they deliver it. Q6: Problems are dealt with in a sympathetic and reassuring manner. Q7: Online technical training services can be relied upon. Q8: The service is delivered on time. Q9: Technical colleges accurately keep records of trainees' activities.
Responsiveness (4 items)	Q10: Technical colleges inform trainees of the specific time that services will be provided. Q11: Trainees receive express services. Q12: Faculty and staff are always cooperative. Q13: Faculty and staff have time to respond to trainees' requests promptly.
Assurance (4 items)	Q14: Members of the training staff and staff are trustworthy. Q15: You feel safe when conducting transactions with technical colleges. Q16: The members of the training staff and staff are polite. Q17: Good support from technical training allows faculty and staff to do their work well.
Empathy (5 items)	Q18: Technical training gives individual attention to each trainee. Q19: Trainees receive personal attention from members of the training staff and staff. Q20: The training staff and staff are aware of your needs. Q21: Technical colleges have your best interests in mind. Q22: Operating hours for online technical training services are appropriate.
General Measurements	Future Interest Behavior: My desire to use online technical training in technical colleges next year is: Overall quality: The quality of online technical training services in technical colleges: Satisfaction: My feelings about online technical training services in technical colleges are best described as follows:

The study used data from item 22 to analyze the importance and performance of online technical education services in vocational colleges. The analysis was presented in a two-dimensional graph with the vertical axis representing importance and the horizontal axis representing performance. The graph was divided into four quadrants: "Focus Here" for highly important but poorly performing features, "Maintain" for relevant and high-

performing features, "Low Priority" for features rated low in both importance and performance, and "Probably Overkill" for unnecessary features with high performance scores. The findings are presented in Figure 4.
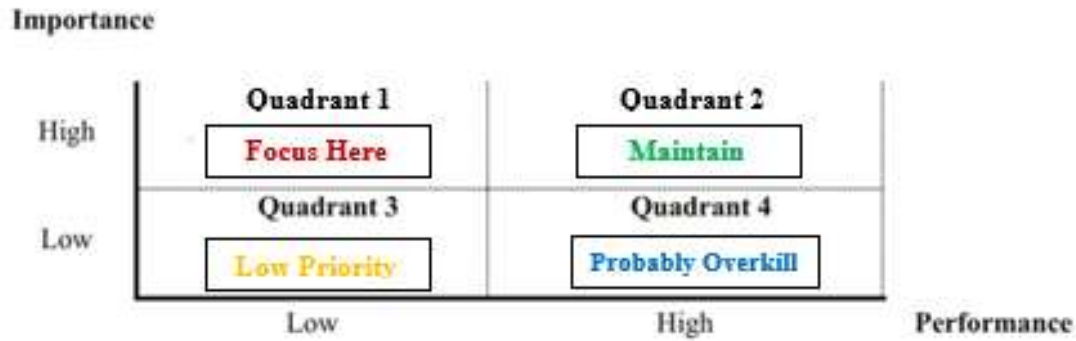

Fig. 4: IPA matrix.

3.1 Cronbach's alpha

Cronbach's alpha is a statistical measure used to assess the internal consistency or reliability of a scale or test. It is named after its creator, Lee Cronbach, who developed the measure in 1951.

Cronbach's alpha is a statistical measure used to determine the internal consistency of a scale or survey. It ranges from 0 to 1, where 0 indicates no internal consistency and 1 indicates perfect internal consistency. It is calculated by analyzing the inter-correlations between the items on a scale to measure the extent to which all items are measuring the same construct or concept. See Equation (5).

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k}\sigma_y^2}{\sigma_x^2}\right) \tag{5}$$

Where:
k = the number of items in the measure
σ_y^2 = variance associated with each item
σ_x^2 = variance associated with the total scores

Cronbach's alpha is commonly used in psychology, the social sciences, and education to evaluate the reliability of tests, questionnaires, and surveys. It can also be used to assess the reliability of other types of measures, such as observational coding schemes and performance assessments.

4 Discussions

In the fall semester of 2023, 400 printed questionnaires were distributed randomly to undergraduate and diploma trainees at Jizan Technical Colleges. A total of 78 questionnaires were excluded from the analysis due to incomplete or ambiguous data or multiple answers provided for a single question, which could indicate a lack of interest. The remaining 322 valid responses were collected from trainees who took online courses in professional technical programs across all colleges. To ensure the reliability of the questionnaire, a reliability test was performed using Cronbach's alpha analysis with SPSS Statistics 26.0. The results presented in Table 3 indicate that all dimensions have a value greater than 0.7, which demonstrates the reliability of the questionnaire.

Table 3: Cronbach's alpha for each dimension of SERVPERF

Dimension	Cronbach's Alpha for Performance	Cronbach's Alpha for Importance
Tangible	0.8311	0.7232
Reliability	0.7159	0.7310
Responsiveness	0.8157	0.8044
Assurance	0.7381	0.7134

Empathy	0.7200	0.7519
All Questions	0.905	0.855

The study collected responses from all the participants and calculated the average value of each item statement. Table 4 provides a summary of the statements and section results for each item, including both meaning and perception. The study used Equation (3) to determine the quality-of-service performance and Equation (4) to calculate the weighted components.

Table 4: Questionnaire results.

Dimensions	Questions	W	P	I	SQ	W	P	I	SQ
Tangibility	1	0.612578	3.751553	3.450311	2.512422	0.605	3.7469	3.42	2.4771
	2	0.59472	3.649068	3.378882	2.436335				
	3	0.624224	3.813665	3.496894	2.576087				
	4	0.588509	3.773292	3.354037	2.38354				
Reliability	5	0.583851	3.65528	3.335404	2.352484	0.5856	3.1826	3.3422	2.3401
	6	0.574534	2.462733	3.298137	2.265528				
	7	0.611025	2.546584	3.444099	2.475155				
	8	0.570652	3.574534	3.282609	2.274845				
	9	0.587733	3.673913	3.350932	2.332298				
Responsiveness	10	0.583075	3.60559	3.332298	2.296584	0.5759	3.5575	3.3036	2.2694
	11	0.576087	3.139752	3.304348	2.268634				
	12	0.557453	3.624224	3.229814	2.17236				
	13	0.586957	3.860248	3.347826	2.340062				
Assurance	14	0.532609	3.906832	3.130435	2.048137	0.5584	3.6809	3.2337	2.1929
	15	0.583851	3.782609	3.335404	2.262422				
	16	0.548913	3.363354	3.195652	2.187888				
	17	0.568323	3.670807	3.273292	2.273292				
Empathy	18	0.590062	3.602484	3.360248	2.371118	0.6102	3.6255	3.441	2.4851
	19	0.579969	3.220497	3.319876	2.32764				
	20	0.614907	3.956522	3.459627	2.47205				
	21	0.642081	4.055901	3.568323	2.684783				
	22	0.624224	3.291925	3.496894	2.569876				
Average		**0.5880**	**3.5446**	**3.3521**	**2.3583**				

The questions that received the highest importance score for the five dimensions are Q21, Q22, and Q20 for empathy, Q3 for tangibility, and Q7 for reliability. Empathy had the highest average importance score of 3.441, indicating that trainees expect more in this area. Conversely, the questions with the lowest importance score for the five dimensions were Q14, Q16, and Q17 for assurance, Q12 for responsiveness, and Q8 for reliability. Responsiveness had the lowest average importance score of 3.2337, suggesting that trainees did not prioritize this aspect. Q14 had the lowest importance score, indicating that trainees did not value trustworthy faculty members and employees in online lectures.

In terms of performance, the questions with the highest perception score for each dimension were Q21 and Q20 for empathy, Q14 for assurance, Q13 for responsiveness, and Q3 for tangibility. Tangibility had the highest average performance score of 3.7469, indicating that trainees perceived tools, technologies, and support from TVET to be up to date and faculty members to be well-dressed and neat in online learning. Conversely, the questions with the lowest performance score for each dimension were Q6 and Q7 for reliability, Q11 for responsiveness, Q19 for empathy, and Q16 for assurance. Reliability had the lowest average performance score of 3.1826, indicating that trainees needed more reliability. Q6 had the lowest performance score, suggesting that trainees desired a more sympathetic and reassuring approach when dealing with problems. See Table 5 and Figure 5.

**Table 5:** Average scores for online learning SQ in TVET.

Dimensions	Average SQ	Average Importance	Average Performance
Tangibility	2.4771	3.4200	3.7469
Reliability	2.3401	3.3422	3.1826
Responsiveness	2.2694	3.3036	3.5575
Assurance	2.1929	3.2337	3.6809
Empathy	2.4851	3.4410	3.6255
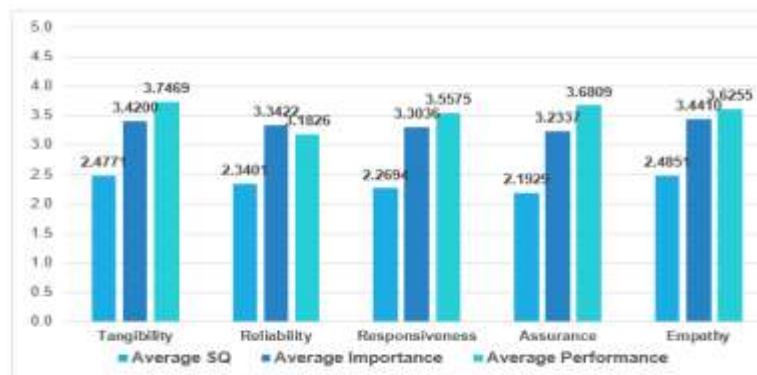
Fig. 5: Average scores for online learning SQ in TVET.

To plot the two-dimensional graph, the average service quality score (SQj) for each item statement was used. The horizontal axis represents the performance of TVET in delivering online learning services, while the vertical axis indicates the importance of each activity to the students. Item statements in the first quadrant, labeled as "Focus Here," have low performance but are highly important to trainees. Therefore, these features should receive the most attention to increase trainee satisfaction, as they are thought to have the greatest impact for the least amount of investment. Q7, Q16, and Q22 are the items in this quadrant. Q7 belongs to reliability and measures the dependability of TVET's online learning services, while Q16 belongs to assurance and measures the politeness of TVET faculty and staff. It is recommended to improve the attributes related to these questions to enhance trainee satisfaction. See Figure 6.
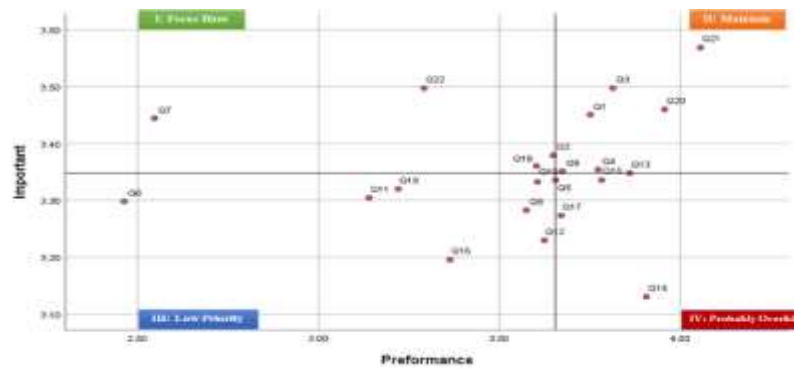
Fig.6: IPA results.

In the second quadrant, several item statements are included, namely Q1, Q3, Q4, Q9, Q20, and Q21, which indicate that the attributes are important and that trainees are satisfied with the management's performance. This suggests the following findings: TVET has up-to-date tools for online learning; the online technical skills training tools used are compatible with the service provided; accurate record-keeping of trainees' activities is maintained; TVET faculty members and staff are aware of trainees' needs; and TVET has trainees' best interests in mind. Most statements in this quadrant relate to the tangibility dimension, indicating that TVET is able to provide tangible services that meet the training needs of trainees, and management should maintain these qualities to retain customers.

The low priority quadrant identifies features that are functioning satisfactorily but are perceived as less important by students compared to other TVET online learning service attributes. This quadrant comprises the components Q6, Q8, Q11, Q16, and Q19. While the results showed that students deemed two items of reliability, one item of responsiveness, one item of assurance, and one item of empathy to not be crucial, this does not mean that management should stop striving to improve these aspects of service. It is still important to handle problems with compassion and ensure that services are delivered promptly. Management may incentivize faculty and staff to engage with trainees politely or to prioritize individualized attention to trainees. Trainees perceive the items in the "possible overkill" quadrant to be excessive and less important, so they should be minimized to avoid excessive investment. If these characteristics are applied to other areas, better outcomes are expected.

Table 5 displays the average scores for each service quality dimension. Figure 5 shows that the average importance is high for all dimensions, particularly empathy and tangibility, while the average performance is low for responsiveness and reliability, and the average service quality is low for assurance. The questionnaire also included three questions at the end to measure future interest, overall quality, and satisfaction for online learning services. Table 6 presents the results, and Figures 7 and 8 display the plotted data, indicating a trend toward "very high" for future interest, overall quality, and satisfaction.

Table 6: Future interest, overall quality, and satisfaction.

Answer	Future Interest	Future Interest %	Overall Quality	Overall Quality %	Satisfaction	Satisfaction %
Very Low	25	7.8%	11	3.4%	10	3.1%
Low	20	6.2%	17	5.3%	20	6.2%
Neutral	57	17.7%	72	22.4%	67	20.8%
High	78	24.2%	109	33.9%	107	33.2%
Very High	142	44.1%	113	35.1%	118	36.6%
SUM	322	100%	322	100%	322	100%
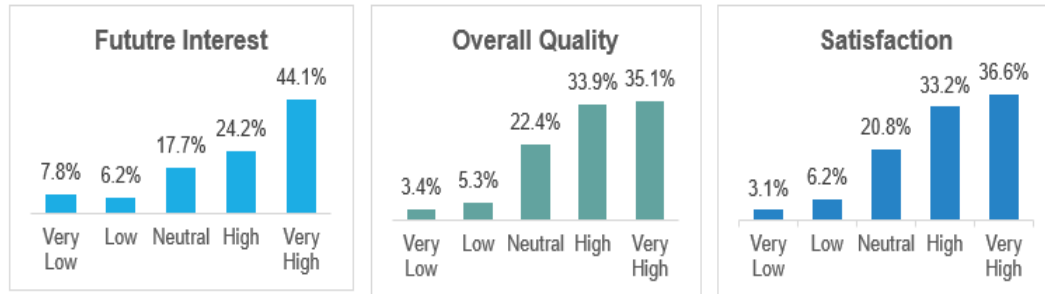
Fig. 7: Future interest, overall quality, and satisfaction.
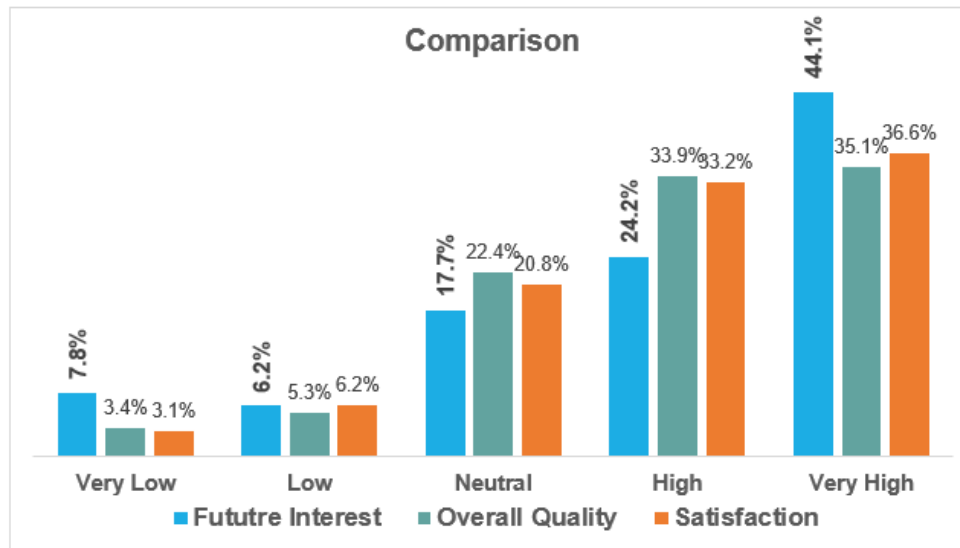
Fig. 8: Future interest, overall quality, and satisfaction comparison.

5 Conclusions

This study used a modified SERVPERF model to evaluate the service quality of TVET at Jizan Technical Colleges. The study found that the model's importance and perception aspects were an effective and cost-efficient approach to assess service quality. The results highlighted the potential benefits of assessing service quality for TVET management, including identifying trainees' views of service quality and areas of inadequacy, to allocate resources, customize marketing efforts, and improve service quality. Based on the overall performance scores, the study recommends that TVET invest more effort into improving online learning service quality and regularly assess and improve all areas of service quality. The study also recommends encouraging employee participation in developing quality standards and implementing regular methods to measure trainee interests, expectations, and perceptions regarding the institution's services.

Thoughts for Future Studies

Technical and vocational education and training emphasizes the importance of implementing regular methods to measure the quality of online learning services and other services provided under faculty supervision. This will ensure that trainees can express their genuine opinions in questionnaires, which can improve their overall satisfaction. By understanding trainees' interests, expectations, and feelings regarding TVET services, vocational technical institutions can better meet trainees' needs and enhance the quality of their offerings.

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