

A CONCEPTUAL FRAMEWORK FOR MEASURING SERVICE QUALITY IN SAFETY TRAINING: SERVQUAL MODEL

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Abstract: *This study presents a conceptual framework for measuring service quality in safety training providers, with an involvement of the influencing element that affect overall safety service efficacy. Since safety is a significant concern in industries such as construction, healthcare, and manufacturing, providing high-quality safety training services is crucial for protecting individuals, meeting regulatory standards, and increasing overall operational efficiency. The framework brings together fundamental theories of service quality, such as the SERVQUAL model, to identify the critical characteristics of service quality in the context of safety services. These aspects are reliability, responsiveness, assurance, empathy, and tangibles, each of which is assessed based on its significance to the safety sector. By linking these characteristics to quantitative outcomes such as incident prevention effectiveness and adherence to safety rules, the framework offers a holistic way to evaluating and improving service delivery. This conceptual model is intended to serve as both a theoretical framework for future empirical research and a practical guide for safety training providers, looking to improve quality in their service offered.*

Keywords: *SERVQUAL, Safety Training, Quality of Service, Operational Efficiency*

Introduction

Background of the Study

Across the Malaysian economy, industries now put a strong emphasis on safety, as this is important especially in workplaces with high risk, such as construction, healthcare and manufacturing. Due to the dangers involved in these jobs, employers must include detailed safety training to guarantee staff follow the rules and avoid risky behaviour.

New data shows that if safety training programs are poor, organizations and their employees will have less motivation to practice safe habits day to day (National Safety Council, 2023). But existing approaches to service quality measurement do not often focus on the distinct aspects of safety-critical training areas, where service issues might be dangerous (National Safety Council, 2023).

To understand the relevance of this study, Malaysia's current safety situation must be considered. In 2023, the Department of Statistics Malaysia reported 38,950 occupational injuries, marking a 13.8% increase over the previous year and resulting in 324 fatalities. Specifically, the construction and manufacturing sectors were responsible for more than 30% of these fatalities, highlighting the continuous hazards faced by workers in these industries. Despite strong regulations under the Occupational Safety and Health Act of 1994 and active enforcement by the Department of Occupational Safety and Health, incident rates remain high. The gap between regulatory compliance and actual safety performance suggests that while systems and protocols exist, the way safety knowledge is delivered and internalized by trainees may require significant improvement.

Additionally, in general, existing academic research often focuses on compliance checklists and immediate knowledge retention, but it rarely explores how the delivery of safety training influences trainee engagement and behaviour afterwards. If trainees lack trust in the instructor or feel dissatisfied with how the training is conducted, even the most comprehensive courses may fail to achieve meaningful safety outcomes. Due to that, this paper addresses this gap by adapting the SERVQUAL model, which was originally developed for industries, especially banking and hospitality, to the context of safety training.

According to Parasuraman, Zeithaml and Berry (1988) in their work on the SERVQUAL model, measuring service quality comes down to examining it through the five elements, which are reliability, responsiveness, assurance, empathy and tangibles. While the model has been proven in different service industries, its use in safety training requires major changes to fit safety laws, skills needed in the industry, and the extreme importance of safety training (Parasuraman et al., 1988).

Problem Statement

Despite mandatory safety training requirements across Malaysian industries, no standardized framework exists for evaluating the service quality of safety training. While the SERVQUAL model is widely recognized for assessing service quality across various industries, it has not been fully adapted or applied to safety training, which is a unique service with life-critical implications. Most safety training providers rely on attendance records or short-term post-training assessments to measure effectiveness. On the other hand, these methods actually fail to capture trainees' deeper perceptions of the overall training experience. As Nicolaidou et al. (2021) stated, being able to understand weak signals and to develop mechanisms for their

identification and management can potentially lead to safer and healthier workplaces. Without insights into how consistently trainers deliver content, how promptly they address concerns, or how credible and empathetic they appear, providers are unable to identify the root causes of ineffective training. As a result, high injury rates continue to increase in critical sectors and Van Dijk and Moti (2023) observe that a gap in recognition and advising about health hazards at work must be addressed by education, training, and expert support, underscoring the urgent need for a comprehensive model that connects service quality dimensions to real-world safety outcomes.

To effectively address this issue, this study proposes developing a comprehensive conceptual framework that integrates traditional SERVQUAL dimensions with safety-specific factors to create a robust service quality measurement tool for safety training providers. Additionally, the framework will provide benchmarking tools enabling safety training providers to assess their performance against industry standards and identify areas for improvement.

Research Objectives (RO)

RO 1: To examine the influence of each SERVQUAL dimension, which consists of reliability, responsiveness, assurance, empathy, and tangibles, on the overall perceived quality of safety training services.

RO 2: To evaluate how this perceived quality impacts operational efficiency indicators, such as incident reduction and fewer safety violations.

Research Questions

1. How do the SERVQUAL dimensions; reliability, responsiveness, assurance, empathy, tangibles, apply to safety training service contexts?
2. What is the relationship between service quality and operational efficiency in safety training?

Significant of the Study

Generally, this study views service quality from a theoretical perspective, having refined the SERVQUAL framework to fit into a specialised area involving the threat of fatal errors.

Safety providers can refer to this paper to see how improving their review procedures could help them deliver safety training more effectively. According to the Department of Statistics Malaysia (DOSM) (2024), the overall rising in workplace injuries makes it necessary to start using efficient safety training techniques. Besides this, the framework shows safety providers how to conform to customer standards and keep their customers safe.

This study also suggests that regulators can set standards in reviewing how well safety training is working. Making incident avoidance and conformity with regulations policy helps companies determine if their safety training programs are effective. Given that all sectors in numerous industries might handle safety differently, this matter is crucial.

Last but not least, this analysis is valuable for managers within organisations when they are making decisions about purchasing safety training. When effectiveness and related service qualities are recognized by organisations, safer and more relevant choices can be made about training processes. It matters more in places where expensive safety training can result in reduced incidents, greater compliance, and improved safety behavior.

Definition of Terms

Independent Variables (Service Quality (SERVQUAL) Dimensions):

Reliability: The ability of safety training providers to consistently deliver promised services accurately and dependably (Ajmal et al., 2022).

Responsiveness: The willingness and promptness of providers to assist clients and address their needs effectively (Mohini & Behera, 2022).

Assurance: The knowledge, skills, and credibility of trainers that instil confidence and trust in clients must be paired with contextual awareness. As Pilbeam and Karanikas (2023) statement indicating that qualified trainers are only effective when they adapt content and delivery to real workplace conditions.

Empathy: The extent to which providers offer caring and individualized attention to client-specific safety concerns (Nicolaidou et al., 2021).

Tangibles: The quality and adequacy of physical facilities, equipment, and technological tools used in training (Mohini & Behera, 2022).

Dependent Variable:

Operational Efficiency: The measurable improvement in workplace safety outcomes, including incident reduction and compliance with safety regulations (Ajmal et al., 2022).

Literature Review

Service Quality in Safety Training

Since SERVQUAL was developed in 1988, service quality research has progressed a lot and now applies in many different industries and situations. At the same time, the use of service quality frameworks in safety-important settings is still not studied in detail and needs unique approaches and modifications. The aspect that makes safety training unique is that it must address issues that are essential for life, follows strict rules set by the government and encourages lasting changes in behavior, so its approaches must be revised to meet these needs.

Previously, safety training was reviewed by how much people learned, if they could recall it and how they acted at the start, with few checks on the roles that service quality played in these results. Most of the modern studies are starting to see how much service quality matters for successful safety training and how it ties trainer abilities with the training surroundings to improve ongoing safety performance.

Development in Safety Training Service Quality

Safety training service quality is being influenced by a number of emerging trends identified in recent studies. The use of virtual reality, augmented reality and simulation have improved the tangibles area of service quality by making training more effective (Scorgie et al., 2024). Reports have shown that simulated training is 75% better at helping people remember information, boosts enthusiasm for training and lifts workers' interest, compared to lecture-based learning.

Due to advances in artificial intelligence, training scenarios are now personalized to fit how each person learns. Because of this development, service providers can improve on the related aspect of SERVQUAL by giving trainees personalized treatment through technology.

Due to changes in the field, new regulatory standards focus on measuring skill and behavior change over the time it takes to complete training. This means providers in safety training must now prove their skills through achievements and improvements rather than just being certified the usual way.

Conceptual Framework

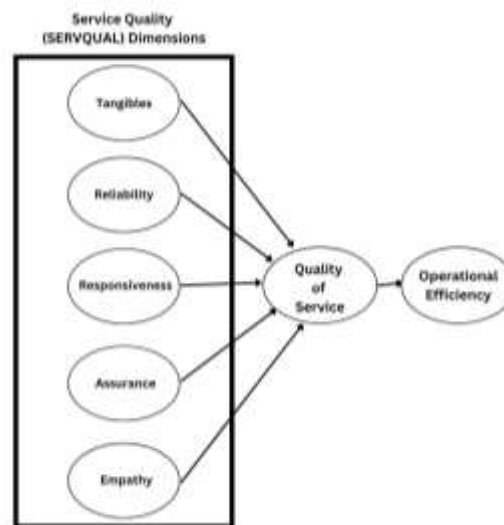


Figure 1: Conceptual Framework

The framework proposed describes how SERVQUAL's five main components influence Quality of Service (QS), which in turn leads to progress on Operational Efficiency (OE) in safety training. It is acknowledged that service attributes by themselves do not affect the organization's results directly, but they need QS to turn the inputs into overall operational efficiency.

The framework uses a sequence (SERVQUAL → QS → OE) because training peoples' safety is so important, as problems with training can lead directly to injuries. The model explains that, with QS acting as the mediating mechanism, training outcomes are converted into actual improvements while considering industry differences, like compliance regulations and technological standards. This work fills a gap by linking safety's unique factors to the well-known SERVQUAL model, thus providing service providers with a way to work on both safety and service improvements at once.

Theoretical Argumentation

Current literature presents several debates regarding the applicability and adaptation of traditional service quality models to safety training contexts. Some researchers argue that the complex, high-stakes nature of safety training demands a new measurement approach, one that goes beyond questionnaires and incorporates qualitative methods to fully capture its multiple dimensions (Ellis et al., 2023). They contend that traditional service quality dimensions

inadequately capture the critical aspects of safety training effectiveness, such as emergency response capability and risk assessment accuracy.

Conversely, other scholars advocate for evolutionary approaches that build upon established service quality theories while incorporating safety-specific modifications. They argue that the fundamental human perceptions of service quality remain consistent across contexts, with dimensional importance weights and measurement criteria requiring adjustment rather than complete replacement (Kainth & Vij, 2020).

Reliability

Reliability defined as the consistent delivery of accurateness (Mohini & Behera, 2022). Providing sufficient, predictable training usually leads to compliance with all safety standards in the workplace, including those set by OSHA and ISO 45001. Other than that, recent data discovered that safe procedural training reduces the number of errors in manufacturing by 32% when carried out in the workplace (OSHA, 2022). If trainers set up sessions following the procedures, with no gaps or delays in the planned content, learning becomes more effective and accident rates fall much faster (Tezel et al., 2021).

Responsiveness

This measurable aspect looks at how quickly providers respond to questions, adjust their content and settling client concerns (Mohini & Behera, 2022). A slow response to emergent risks at work, such as hazards from new machinery, reduces trust and raises the risk of accidents. In organizations where trainers worked on safety issues for more than 48 hours, a 27% increase in incident rates has been recorded. Being responsive helps students relate theory to practice, in order for them to deal better with hazards before they occur.

Assurance

Trainer assurance is made up of their credentials, proved proficiency and the trust they inspire (Casey et al., 2021). Anyone teaching safety training should have industry-related knowledge, as an example, they are a certified hazardous materials handler. Generally, researcher found that trainer assurance, which is built on credibility, communication, and technical knowledge, has been shown to influence worker compliance and safety behavior. Because of this dimension, trainees are more likely to follow the recommended strategies.

Empathy

By being empathy, providers pay attention to their clients' particular safety problems, including those caused by language or the site they are working at. Workplaces with diverse cultures benefit from empathetic conversion, such as offering written materials in more than one language, which improves learning and helps employees stay interested. Generally, risks can be mitigated in advance due to high-empathy training (Wang, Jiang, & Blackman, 2021).

Tangibles

Learning experience is shaped with the use of simulators, VR tools and fresh technologies (Mohini & Behera, 2022). Training with old tools is less reliable, for instance, construction companies using VR simulations reported more than half less incidents of falls than those relying on traditional manuals (Pribadi et al., 2024). Generally, the providers' commitment to quality is visible in tangibles which also impact how customers see the service.

Quality Of Service and Operational Efficiency

SERVQUAL is assessed as Quality of Service (QS) by combining several areas. While safety training aims to make people satisfied, QS shows the extent to which trainees feel able to use the learned safety methods. When QS is high, what is learned in training actually leads to safe behaviors in reality.

Next, operational efficiency (OE) can be demonstrated by reflected improvements, for instance, there are fewer incidents in a company that complies with safety rules and workers are more effective. Additionally, results from a 12-factory analysis showed that a 1 standard deviation improvement in QS related to fewer lost-time injuries by 19% and better scores on compliance audits by 14% (DOSM, 2024). In this way, QS connects ideas from SERVQUAL with the results achieved in OE.

Linking SERVQUAL Dimensions to Quality of Service

Reliability → QS : Training delivered consistently reduces discomfort and encourages trust in an emergency (Ajmal et al., 2022).

Responsiveness → QS : Adapting fast signals an important trait which helps the service be perceived as better (Nicolaidou et al., 2021).

Assurance → QS : When results meet the criteria, QS increases, with validated trainers guiding more people towards adopting the protocol (Cooper & Phillips, 2022).

Empathy → QS : Having empathy leads to QS by providing customized attention that increases a sense of safety among employees and helps them to act and report hazards quickly (Groves et al., 2022).

Tangibles → QS : Learning through tools such as simulators can help people to improve and retain their skills (Pribadi et al., 2024).

Hypotheses Development

H1: SERVQUAL Dimensions (Reliability, Responsiveness, Assurance, Empathy, Tangibles) positively influences Quality of Service.

- Each dimensions of SERVQUAL model addresses a unique service gap, as their connection improves overall perspective about quality (Mohini & Behera, 2022).

H2: Quality of Service positively influences Operational Efficiency.

- High Quality of Service cultivates safety-conscious behaviors, directly reducing incidents and non-compliance (Hutchinson et al., 2021).

Conclusion

Overall, this conceptual study proposes a comprehensive model that links the quality of safety training services to operational safety outcomes. It addresses a critical gap in the literature and provides a theoretical basis for improving safety training effectiveness in Malaysia. Lastly, future researchers are encouraged to empirically validate this framework and for policymakers to consider these dimensions when designing safety training regulations and standards.

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