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Effects of Perceived Quality on TVET Students' Continuance Intention to use Video Conferencing Technology

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Abstract
This study investigates the continuance intention to use video conferencing technology (VCT) among Malaysian TVET students, a group often overlooked due to their hands-on learning needs. Using survey data from 114 TVET students and Structural Equation Modelling (SEM), the study found that perceived quality significantly influenced expectation confirmation and satisfaction. However, perceived usefulness did not impact satisfaction or continuance intention, diverging from traditional models. The findings suggest that factors like learning experience quality and VCT's alignment with practical training are more critical. This research extends the Expectation Confirmation Model (ECM) by offering new insights into educational technology in vocational contexts.

Keywords: Perceived quality; Video conferencing technology; Continuance intention; TVET

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1.0 Introduction

The integration of Information and Communication Technology (ICT) into higher learning institutions (HLIs) has significantly transformed the landscape of education delivery, driving a shift towards more flexible and accessible learning environments. In the post-pandemic era, students now have greater autonomy in choosing between virtual, face-to-face, or hybrid learning modes, with blended approaches emerging as the new norm. Video Conferencing Technology (VCT) has become a cornerstone for real-time interaction, collaboration, and synchronous learning. However, its applicability within Technical and Vocational Education and Training (TVET) presents unique challenges, as the hands-on, experiential nature of TVET curricula often demands physical engagement and practical application that current VCT platforms may struggle to replicate effectively.

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TVET HLIs strongly emphasise hands-on, experiential learning, often in disciplines that rely heavily on physical manipulation, technical demonstrations, and face-to-face instruction. This practical orientation presents a critical challenge when integrating digital tools like VCT, which may not fully accommodate the tactile and interactive components essential to vocational training (Yeap et al., 2021). While VCT gained rapid traction during the pandemic as a necessary alternative to in-person learning, questions remain regarding its long-term sustainability and effectiveness in TVET education. Notably, there is a scarcity of empirical research exploring the continuance intention of students to use VCT beyond the pandemic (Prasetya et al., 2021; Sobaih et al., 2021). This gap highlights the relevance and urgency of the present study, which aims to examine the key factors influencing TVET students' continued use of VCT in the evolving post-pandemic educational landscape.

Previous studies have predominantly examined the adoption and continuance of digital technologies within conventional HLIs, often neglecting the unique pedagogical demands and contextual challenges faced by TVET programs. Unlike traditional academic disciplines, TVET education emphasizes hands-on, skills-oriented learning, which relies heavily on practical engagement, specialized laboratory access, and close instructor–student interaction, elements that are difficult to replicate in virtual environments (Sobaih et al., 2021). To address this gap, the present study aims to investigate how perceived quality, comprising system quality, information quality, and support quality, influences students' confirmation, satisfaction, and continuance intention to use VCT in TVET contexts.

Grounded in the DeLone and McLean Information Systems Success Model (D&M ISSM) and integrated with the Expectation-Confirmation Model (ECM), this research seeks to determine how perceived quality factors shape students' post-adoption experiences and long-term engagement with VCT. By focusing specifically on TVET students, the study highlights a critical and underexplored dimension in technology continuance research, as their educational context often demands more reliable systems, superior platform quality, and responsive technical support to sustain online learning. Ultimately, this study aims to develop an integrated framework that captures the interplay between perceived quality and continuance intention, thereby offering theoretical insights and practical implications for improving the sustainability and effectiveness of online T&L in TVET education (Safira et al., 2021).

2.0 Literature Review

VCT enables remote, real-time communication and has become increasingly integral to educational delivery, particularly amid the global shift toward digital learning accelerated by the COVID-19 pandemic (Pal, 2025). Platforms such as Zoom, Microsoft Teams, and Google Meet have emerged as key tools for synchronous learning, providing opportunities for real-time interaction, collaborative engagement, and flexible access to educational content. These platforms support learner-centered pedagogies by facilitating communication, immediate feedback, and virtual collaboration, which are essential components of effective online instruction (Sobaih et al., 2021).

Despite these advantages, the implementation of VCT in TVET contexts presents notable challenges. TVET curricula often emphasize experiential, hands-on learning, which is difficult to replicate through VCT alone (Subrahmanyam, 2022). Skills-based training typically requires physical interaction with tools, equipment, and real-world simulations, elements that current VCT platforms are ill-equipped to fully support. As a result, while VCT enhances engagement and accessibility in general education settings, its capacity to deliver the practical, tactile experiences fundamental to vocational training remains limited (UNESCO, 2021). This underscores the need for hybrid or augmented approaches that combine VCT with other immersive technologies, such as virtual simulations or on-site practicum, to meet the unique demands of TVET education.

According to Bhattacherjee (2001), users' satisfaction and perceived usefulness are the primary determinants of continuance intention. While ECM has been widely recognized as a robust model for predicting post-adoption behavior, it has been criticized for its limited attention to contextual and pedagogical factors, particularly within educational environments such as TVET (Daryanto, 2022). In TVET's teaching and learning context, technology use extends beyond individual satisfaction; it is shaped by institutional support, curriculum relevance, and practical skill acquisition demands. Therefore, a critical review of ECM in this setting highlights the need to integrate additional constructs, such as quality-related factors, to better capture the complexity of technology adoption and continuance use in TVET. Incorporating these dimensions allows for a more comprehensive understanding of how learners and educators engage with technology to enhance learning outcomes and vocational competence.

While the adoption of ICT tools, including e-learning platforms and VCT, has grown significantly in conventional HLIs, research exploring TVET students' continuance intention to use these technologies remains limited. Notably, a study by Mazlan et al. (2022) explored various factors influencing the adoption of e-learning; however, their study does not delve into the continuance intention from the perspective of quality dimensions as defined by the D&M ISSM. This oversight highlights a critical gap in understanding the long-term sustainability of technology use within vocational education settings, where practical skill development and hands-on engagement are paramount.

ECM posits that user satisfaction and perceived usefulness predict continued technology use. However, it lacks depth in evaluating service and system quality (Prasetya et al., 2021). Therefore, integrating the system, information, and service quality, core to D&M ISSM, into ECM may provide better insights. Building on the D&M ISSM and the ECM, this study proposes a comprehensive model to investigate TVET HLI students' satisfaction and continuance intention to use VCT as an online learning platform. The framework, depicted in Figure 1, includes five key constructs and six hypothesised relationships designed to explore the interactions among these constructs.

The D&M ISSM highlighted that the essential aspect for encouraging users to persistently engage with technology is the quality attributes that include three vital dimensions: information quality, system quality, and service quality. The quality factor, derived from the D&M ISSM, has been widely adopted in research exploring the continuance use of technology. For instance, Gu et al. (2021) demonstrated that quality factors positively influenced the students' continuance intention to use Massive Open Online Course (MOOC)

platforms, highlighting the importance of maintaining high standards across these dimensions. Based on this finding, the following hypotheses can be proposed for the study:
H1: Perceived quality positively affects confirmation of VCT
H2: Perceived quality positively affects the satisfaction of VCT

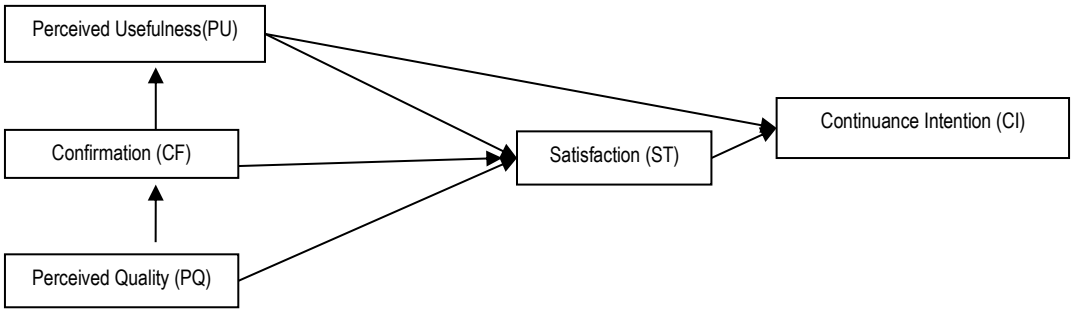

Fig. 1: Proposed Model

There are numerous studies on technology continuance demonstrating the applicability of ECM in understanding and predicting the users' intentions to continue using technology. Liu (2024) investigated the determinants of students' continuance intention to use mobile learning through an extended ECM and found that perceived usefulness, confirmation, and perceived quality were the key antecedents of satisfaction, which in turn influenced the continuance intention. This underscores the strength of ECM as a framework by analysing the technology usage patterns, particularly in educational settings. Building on these insights, this study proposes the following hypotheses based on the ECM framework to explore further the factors influencing the continuance intention to use VCT, particularly within the context of TVET institutions:
H3: Confirmation positively affects the perceived usefulness of VCT
H4: Confirmation positively affects satisfaction with VCT
H5: Perceived usefulness positively affects satisfaction with VCT
H6: Perceived usefulness positively affects the continuance intention of VCT
H7: Satisfaction positively affects the continuance intention of VCT

3.0 Methodology

This study adopts a descriptive research design, employing a structured questionnaire designated for TVET students studying at Universiti Kuala Lumpur, Malaysia's largest TVET higher learning institution. The data collection utilised a convenience sampling strategy, which was chosen to ensure a diverse representation of the students, capturing a wide range of perspectives and experiences. The survey instrument was thoroughly adapted from the ECM and the D&M ISSM, ensuring it was well-suited to explore the relationships between perceived quality, satisfaction, and continuance intention in using VCT.

The majority of respondents in this study are undergraduate students from the Faculty of Information Technology and the Foundation of Science and Technology. Out of a total of 200 students within the faculty, 114 students completed the questionnaire. This sample size is particularly justified by the Central Limit Theorem (CLT), which asserts that regardless of the population distribution, the sampling distribution of the sample mean approaches normality as the sample size increases, typically around 30 or more respondents (Kwak & Kim, 2017).

The collected data were subjected to rigorous statistical analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS 3. This analytical technique was selected due to its strength in modeling complex cause-and-effect relationships among latent variables, particularly in research contexts involving multiple interconnected constructs and predictive objectives. PLS-SEM is especially advantageous for studies with relatively small to medium sample sizes, non-normal data distributions, and theory development purposes, conditions that align well with the aims of the present study (Akbar et al., 2025). Its ability to simultaneously assess both measurement and structural models made it an appropriate and robust methodological choice for exploring the hypothesized relationships in this research framework.

4.0 Findings

4.1 Measurement model assessments

This study conducted a comprehensive evaluation of the measurement model to ensure the reliability and convergent validity of the constructs, thereby affirming the accuracy and integrity of the collected data. Reliability was assessed using Cronbach's Alpha and Composite Reliability (CR), both widely recognized as indicators of internal consistency. As recommended by Hair et al. (2019), values

exceeding the threshold of 0.70 are considered acceptable indicators of construct reliability. The results revealed that all constructs demonstrated Cronbach's Alpha and CR values well above this benchmark, confirming that the measurement items consistently and reliably captured the underlying latent variables. This strong internal consistency supports the robustness of the measurement model and provides a solid foundation for subsequent structural analysis.

Convergent validity, which evaluates the extent to which a set of indicators accurately reflects their associated latent construct, was assessed using the Average Variance Extracted (AVE). As recommended by Hair et al. (2019), an AVE value of 0.50 or higher indicates that the construct explains more than half of the variance in its indicators, thus confirming adequate convergent validity. In this study, all constructs exhibited AVE values exceeding the 0.50 threshold, thereby providing strong evidence of convergent validity. The detailed results of the reliability and validity assessments are presented in Table 1, with all metrics meeting or surpassing the recommended criteria. These findings affirm that the measurement items are both statistically reliable and conceptually valid, ensuring the robustness of the measurement model for subsequent analysis.

Table 1. Convergent validity and reliability

Constructs	Loading	Cronbach's Alpha	CR	AVE
CF1	0.955	0.905	0.954	0.913
CF2	0.956			
CI1	0.963	0.966	0.978	0.937
CI2	0.972			
CI3	0.968			
LS1	0.943	0.906	0.941	0.843
LS2	0.926			
LS3	0.884			
PU1	0.954	0.893	0.933	0.823
PU2	0.923			
PU3	0.928			
PQ1	0.855	0.928	0.954	0.874
PQ2	0.942			
PQ3	0.923			

In this study, discriminant validity was rigorously assessed using the criterion suggested by Fornell and Larcker (1981). According to this method, a construct is considered to have adequate discriminant validity when the square root of its AVE is greater than its highest correlation with any other construct in the model. As shown in Table 2, the square roots of the AVE for all latent variables exceed their corresponding inter-construct correlations, thereby confirming that each construct is empirically distinct and that discriminant validity is satisfactorily established across the measurement model.

Table 2. Discriminant validity

Constructs	CF	CI	ST	PQ	PU
CF	0.955				
CI	0.747	0.968			
ST	0.938	0.822	0.918		
PQ	0.769	0.754	0.82	0.907	
PU	0.713	0.669	0.75	0.792	0.935

4.2 Structural model assessments

The structural model illustrates the hypothesised relationships among constructs and is assessed using several key metrics to determine its adequacy and effectiveness. The model's reliability is evaluated through the coefficient of determination (R^2), where values above 0.1, as per Falk and Miller (1992), indicate sufficient explanatory power; all R^2 values in this study exceeded that threshold, confirming strong predictive capability. Predictive relevance was assessed using the Q^2 statistic, with all values greater than zero indicating the model's effectiveness in forecasting outcomes related to continuance intention to use VCT. Additionally, model fit was verified through the Standardized Root Mean Square Residual (SRMR), which at 0.083, remained within the acceptable range below 0.10 (Hair et al., 2019), confirming that the structural model fits the data well.

Table 3. Goodness of model

Construct	R^2	Q^2
CF	0.592	0.528
CI	0.683	0.63
LS	0.905	0.744
PU	0.509	0.435

The structural model illustrates the relationships between the constructs within the proposed study framework. Based on the analysis of the structural model, all hypotheses in this study were supported, with the exceptions of H5 and H6. The H5 and H6 evaluate whether PU is positively related to SAT and CI, respectively. The results revealed that PU has an insignificant impact on SAT ($\beta = 0.065$, $t = 0.946$, $p = 0.345$) and CI ($\beta = 0.117$, $t = 1.101$, $p = 0.272$). This suggests that students did not perceive the usefulness of VCT as a

significant determinant of their satisfaction or their intention to continue using it in TVET education. Consequently, H5 and H6 were not supported. Table 4 provides a summary of the hypothesis testing results.

Table 4. Hypothesis testing

Hypothesis	β	t-Value	P-Values	Decision
H1:PQ -> CF	0.769	12.519	0.000	Supported
H2:PQ -> ST	0.203	2.741	0.006	Supported
H3:CF -> ST	0.736	11.709	0.000	Supported
H4:CF -> PU	0.713	7.804	0.000	Supported
H5:PU -> CI	0.117	1.101	0.272	Not Supported
H6:PU -> ST	0.065	0.946	0.345	Not Supported
H7:ST -> CI	0.734	6.988	0.000	Supported

5.0 Discussion

This study confirms that, from the perspective of TVET students, the quality factors associated with VCT, namely, system quality, service quality, and information quality, are crucial to their online learning experience. These perceived quality factors significantly determine the students' confirmation of their initial expectations and their overall satisfaction with using VCT for educational purposes. Specifically, perceived quality was found to explain 59.2% of the variation in students' confirmation, indicating that a high-quality VCT platform is instrumental in shaping and reinforcing students' initial expectations. The results suggest that when the students perceive a VCT platform as reliable, supportive, and information-rich, they are more likely to feel satisfied and motivated to continue using it. These findings align with previous research by Prasetya et al. (2021), who also identified these quality factors as key influencers of the students' satisfaction and continuance intention in digital learning environments.

Moreover, the study revealed that expectation confirmation has a significant and positive influence on both perceived usefulness and user satisfaction with VCT, thereby providing strong support for hypotheses H3 and H4. These results align with prior studies grounded in the ECM, reaffirming the idea that when students' initial expectations of VCT are met or exceeded by their actual experiences, their perceptions of the technology's utility and their satisfaction levels are notably enhanced. This finding highlights the pivotal role of expectation management in shaping favorable attitudes toward the continued use of educational technologies. Ensuring that VCT delivers on students' anticipated benefits is therefore essential for sustaining engagement and long-term adoption in online learning environments.

However, in contrast to the original propositions of the ECM, this study found that perceived usefulness did not have a significant effect on either user satisfaction or the continuance intention to use VCT. This result challenges the conventional ECM framework, which emphasizes perceived usefulness as a key determinant of both satisfaction and continued use of technology in educational contexts. The lack of a significant relationship observed in this study suggests that, within the TVET setting, other factors, such as user experience, system quality, or the nature of hands-on learning, may exert a stronger influence on students' continuance use of VCT (Hatta et al., 2024).

This discrepancy can be explained by an insight from Liao et al. (2009) suggesting that while perceived usefulness is a crucial determinant of initial adoption, over time, as the users become accustomed to the technology, its perceived usefulness becomes an expected feature rather than an active determinant of continued usage. As an alternative, other factors, such as user attitude and confirmation of the technology's efficacy, take precedence in influencing the continued use. This notion is further supported by Daryanto (2022), who concluded that perceived usefulness had no apparent effects on user satisfaction with information systems, highlighting that other factors may play a more prominent role in shaping the users' satisfaction and continuance intention over time

The results underscore the importance of prioritizing system quality, interactive learning design, and real-time feedback mechanisms when implementing VCT. Rather than focusing solely on demonstrating the usefulness of the system, institutions should ensure that VCT platforms replicate hands-on, practical learning experiences that align with the applied nature of vocational training. This approach can enhance learner satisfaction, engagement, and overall learning outcomes.

6.0 Conclusion& Recommendations

The primary objective of this study is to determine how the perceived quality influences the continuance intention of TVET students to use VCT for online learning. Grounded in the theoretical underpinnings of the D&M ISSM and the ECM, this research proposes a comprehensive conceptual framework to identify and assess the key determinants that drive sustained VCT usage in vocational education settings. The analysis yielded significant results while providing meaningful insights into the factors shaping TVET students' long-term engagement with VCT. Notably, the study's findings challenge the traditional ECM framework by suggesting that in the TVET context, where practical engagement and hands-on learning are pivotal, the perceived usefulness of VCT may not be as influential as other factors. For TVET students, the effectiveness of VCT is more closely tied to its ability to support their specific learning needs, such as the quality of the system, virtual simulations, and real-time feedback.

With the rapid emergence of the Metaverse as an immersive, interactive, and 3D virtual environment, future research could explore its potential application within TVET education. The Metaverse offers new opportunities to simulate real-world training environments, enabling students to engage in experiential, hands-on learning without the physical constraints of traditional workshops or laboratories. By integrating virtual reality (VR), augmented reality (AR), and mixed reality (MR) technologies, the Metaverse can replicate technical

scenarios, enhance collaboration, and provide personalized learning experiences. Future studies could therefore investigate factors influencing the adoption, effectiveness, and pedagogical value of Metaverse-based learning environments in TVET institutions, examining how these emerging technologies can complement or even extend beyond current VCT practices.

This study, while providing valuable insights, is not without its limitations. Despite demonstrating satisfactory validity and reliability, the research was constrained by a limited sample size, with respondents drawn exclusively from a single TVET institution in Malaysia. As a result, the findings and the research model developed cannot be easily generalised to other TVET settings or broader contexts. To enhance the generalizability and applicability of the model, future studies should consider testing it across multiple institutions and regions, both within Malaysia and internationally. Moreover, the research model in this study was primarily based on constructs from the D&M ISSM and the ECM. While these frameworks provided a solid foundation, future research could enrich the model by incorporating additional variables from other relevant theories. For instance, factors such as self-efficacy, habit, and trust could be explored to provide a more comprehensive understanding of the determinants of continuance intention in VCT usage.

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Paper Contribution to Related Field of Study

This paper makes a significant contribution to the field of educational technology and TVET by extending the ECM through the integration of perceived quality dimensions from the D&M ISSM. While previous studies have largely focused on technology adoption in general academic settings, this research addresses a critical gap by examining the continuance intention to use VCT among TVET students, a group with unique pedagogical needs due to the hands-on nature of their training. The study provides empirical evidence that perceived quality plays a more pivotal role than perceived usefulness in influencing user satisfaction and continuance intention within TVET contexts. These insights offer practical implications for educators, system designers, and policymakers seeking to optimise digital learning environments in vocational education and contribute to the broader discourse on technology continuance by tailoring theoretical models to suit skill-based learning environments.

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