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Examining the contributing factors of virtual event quality toward event satisfaction among attendees

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Abstract: Due to the rising acceptance of virtual events, more empirical studies are needed to determine factors influencing attendees' satisfaction. It is crucial to comprehend the essential factors determining the quality of virtual events as the virtual world continues to define the future of event experiences. Given these considerations, event planners may create and deploy virtual experiences meeting the diverse needs and preferences of the attendees. Hence, the main purpose of this paper is to examine the influence of virtual event quality dimensions on the level of event satisfaction among the attendees. A cross-sectional study was undertaken by administering a survey instrument to collect response data from participants in virtual events. There were 124 valid responses obtained for data analysis. Descriptive and inferential analyses were performed using IBM SPSS version 28. The study findings revealed that there was a statistically significant relationship between the quality of virtual event factors and event satisfaction among the attendees. The results of regression analysis indicated that vividness (p=0.016), functionality (p=0.003), entertainment (p=0.029), fulfillment (p=0.037), privacy (p=0.037), and social presence (p=0.001) were found to be significant predictors of event satisfaction. In conclusion, this study highlights the importance of considering several factors of event quality, particularly in planning and implementing virtual events. Event organizers can enhance attendees' satisfaction through the use of more immersive and substantial virtual experiences, by focusing on attributes such as vividness, functionality, entertainment, fulfillment, privacy and social presence.

Keywords: *Event satisfaction, virtual event quality, virtual events, and attendees*

1. Introduction

Virtual events have gained more traction among the event attendees all over the world. Due to pandemic of Covid-19, it had changed the method on how we deliver our event intention to the participants. The emergence of various digital products, advertisements and media platforms has shifted the costlier physical events to digital or online events that cut more costs in terms of organizing and attending the event (Hu et al., 2017). The popularity of virtual events is attributed much to various factors such as participants' readiness for online events, and the dissemination of information about the virtual events by the social media platform and online groups. In China, due to the growth of its business activity and being the second largest business economics position in the world, the Internet has played a major role in business transactions thus promoting more virtual business events and conferences to attract potential customers (Liu et al., 2017). In addition, due to the COVID-19 pandemic, the demand for virtual events is increasing in more activity-based programs have shifted to virtual experience platforms (VEP) in a study among the Korean population (Kim et al., 2023). This showed the population leaning direction to virtual events and occasions in their life apart from physical events.

Among the issues that plague the success of virtual events is event satisfaction. Event satisfaction is defined as attendees' satisfaction towards various aspects of the virtual events such as social presence, security and privacy, virtual events functionality as well as entertainment element in the event itself. The social presence in which the connection of various parties in the industry that might interest the potential attendees to participate in the virtual events if there are potential new networking or friendship relations can be established from the virtual events (Oshimi et al., 2023). Academic and business events might somewhat become an ideal platform that connects these professionals for future business collaboration. Lacking this element in the virtual events might detract the potential attendees' interest to attend in the future. Furthermore, the security and privacy of the attendees in the virtual events is one of the important indicators of the participants. One might feel insecure if their participation in the virtual events might expose their personal information. This is essential, especially in any virtual events such as gaming, virtual meetings and online offices which may open the participants to wrongful personification by hackers and strangers who want to take advantage (Mohd Tariq et al., 2021). Deficiencies of adequate level of security and privacy in the virtual events being organized may cause the previous participants to not re-attend the future virtual events. These quality characteristics should be given

priority when organizing virtual events to ensure a sufficient level of satisfaction is achieved among virtual event participants. Therefore, the objective of the paper is to examine the influence of virtual event quality dimensions on the level of event satisfaction among the attendees thus allowing for better dimensions to be taken seriously whenever we want to organize virtual events.

2. Literature Review

Event satisfaction: In recent years, the event industry has significantly shifted from traditional physical events to virtual and hybrid formats. Attendee satisfaction in both physical and virtual events has thus become crucial for event organizers to deliver successful experiences. Both physical and virtual events require high-quality and relevant content, which correlates directly with increased satisfaction levels in both settings. In physical events, ambiance, including lighting, acoustics, and overall venue aesthetics, plays a crucial role in enhancing attendee experience and satisfaction (Melly et al., 2023). However, the technical aspects, such as platform stability and audiovisual quality, are critical for attendees' satisfaction in virtual events. Ramli and colleague (2018) indicates that technical glitches and poor-quality streams can significantly detract from the attendee experience. Nevertheless, content quality, interactivity, and engagement are vital factors for both settings of the events. Interactive sessions significantly increase the satisfaction of physical event attendees by fostering participation and engagement. Similarly, features such as live chats, virtual networking rooms, and opinion polls increase attendance at virtual events and increase satisfaction among attendees (Campos et al., 2018; Capasa et al., 2022). In terms of content quality, high-quality and relevant content was found to be significantly correlated with higher satisfaction among attendees (Melo et al., 2022). For example, the technologies of virtual reality offer immersive experiences that can increase satisfaction by providing a sense of presence and engagement (Melo et al., 2022). Moreover, the effective use of event technology, including data analytics and artificial intelligence (AI), can personalize and improve attendee experiences, further driving satisfaction (Chen & Jung, 2024).

Dimensions of virtual events quality: This beginning of virtual events has transformed how people engage with conferences, seminars, and other large gatherings. This rapid shift has necessitated a deeper understanding of attendee satisfaction and the quality of virtual experiences. The quality of these virtual events significantly impacts attendee satisfaction. Recent studies emphasize the importance of vividness in virtual events, particularly with advancements in virtual reality (VR) and augmented reality (AR) (Jung et al., 2016; Liberatore & Wagner, 2021). Vividness, which refers to the richness and realism of the sensory information presented, has been shown to significantly influence perceived usefulness, enjoyment, and attitudes toward virtual shopping experiences (D. Kim & Ko, 2019). Vividness and interactivity are critical design elements that directly or indirectly impact an attendee's sense of presence, sensory experience, attitude, and behavioral intentions in virtual events. Yozcu, Kurgun, & Bağıran, (2023) found that high levels of visual and auditory vividness in VR environments enhance user immersion and satisfaction. Similarly, Wreford, Williams, & Ferdinand (2019) demonstrated that the use of AR to create vivid, interactive experiences can significantly increase attendee engagement and satisfaction. Thus, engaging attendees through vivid and interactive virtual experiences can foster greater immersion, satisfaction, and behavioral intentions.

Functionality refers to the practical aspects of the virtual event platform, including features like chat, Q&A sessions, screen sharing, and recording capabilities. Functional platforms enable seamless interactions and contribute to a smooth user experience. Hung and colleagues (2024) suggests that comprehensive functionality, including interactive tools and accessibility features, is critical for user satisfaction. Moreover, the perceived usefulness and ease of interaction with various platform functionalities directly impact attendee satisfaction (Li et al., 2024).

The speed and quality of feedback provided by the virtual event platform satisfy attendees. Recent studies highlight the importance of real-time interactions and system responsiveness. Hammady and colleagues (2021) found that highly responsive platforms significantly enhance user satisfaction by providing timely feedback and reducing wait times. Similarly, Neuhofer and colleagues (2021) emphasized that responsive virtual event systems improve user engagement and reduce frustration.

In virtual events, entertainment value involves providing enjoyable and engaging content, including interactive

elements, gamification, and dynamic presentations. Hamari and colleagues (2014) indicate that incorporating gamification elements into virtual events can significantly boost attendee engagement and satisfaction. Similarly, a research study found that entertainment value, such as interactive and visually appealing content, strongly predicts user satisfaction in virtual conferences (Jung et al., 2024). Furthermore, it is essential to consider the user-friendliness of the virtual event platform. This encompasses the intuitiveness of the interface, the simplicity of navigation, and the clarity of instructions. Previous studies reaffirm the importance of ease of use in virtual event satisfaction. A study by Pushpakumar and colleagues (2023) found that user-friendly interfaces significantly enhance user satisfaction and reduce the cognitive load on attendees. In addition, the study reported that ease of use positively affects user acceptance and continued use of virtual event platforms (Pushpakumar et al., 2023).

Fulfillment in virtual events can be referred to as the extent to of the event meets attendees' expectations and needs. This includes the relevance and quality of the content, the ability to network, and the overall value derived from attending the event. According to Jung and colleagues (2024) indicated that motivational factors for attending virtual events revealed that preferences of attendees are influenced by online content engagement, the content of the event, being in a global community, meeting like-minded people and professionals, the reputation of the event, keynote speakers, and the use of mobile apps. Perceived values are also an important variable in influencing the satisfaction of users when attending events including the virtual ones. Privacy and security are critical factors for the success of virtual events. Attendees need to trust that their personal information and interactions are secure. Studies highlight growing concerns over privacy and security in virtual environments as they directly influence attendee trust and satisfaction. Moreover, perceived security and clear privacy policies significantly enhance user trust, which in turn boosts overall satisfaction with virtual events.

Social presence is crucial in virtual events. Social presence was originally defined as a sense of being with another (Biocca et al., 2003). Thus, it enhances the feeling of being "with" others in a virtual environment, which in turn improves attendee satisfaction. Social presence is facilitated by interactive features such as video chats and networking lounges, which foster a sense of community and engagement. A high degree of social presence is associated with increased user satisfaction and engagement in online environments. Additionally, the contextual nature of social presence, noting that its effectiveness can vary depending on the platform's design and the participants' preferences. Fauville and colleagues (2021) discusses how video conferencing features, particularly the intensity of social interactions, contribute to both the benefits and potential drawbacks of social presence, such as "Zoom fatigue." However, when appropriately managed, social presence in virtual settings can significantly enhance satisfaction by creating a more engaging and interactive environment. These sources collectively highlight the importance of carefully designing virtual event platforms to maximize social presence, thereby enhancing attendee satisfaction.

The quality of virtual events is multi-faceted, with vividness, functionality, responsiveness, entertainment, ease of use, fulfillment, privacy and security, and social presence all playing crucial roles in shaping attendee satisfaction. Ultimately, the success and sustainability of virtual events can be influenced by the comprehension and improvement of these factors, which can result in more effective and fulfilling events

Methodology

Design and Participants

The study carried out a cross-sectional survey to evaluate the perspectives of university students regarding their satisfaction with virtual events. A convenience sampling approach was employed to select participants from the target population.

Data collection and analysis

A 47-item questionnaire designed to discover the demographic profile, and pattern of attendees attending virtual events and assess the influencing factors of virtual event quality on satisfaction among attendees was distributed to undergraduate students at several faculties in a public university around Selangor, Malaysia. A total of 130 students took part in this study. However, there were 124 valid responses obtained for data analysis. The questionnaire consisted of three sections: (a) the demographic characteristics of attendees, (b)

patterns of attending virtual events, (c) accessing the virtual events quality and (d) overall event satisfaction. A five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used. The items of the questionnaire were derived from previous literature (Kim et al., 2024).

The data was analyzed using statistical software, i.e., IBM SPSS (Statistical Package for the Social Sciences) version 28.0. The data analysis comprised both descriptive and inferential statistics. The demographic characteristics and frequency of attending virtual events were described using frequencies and percentages. A regression analysis was performed to examine the factors of event quality that influence the overall satisfaction of respondents at virtual events.

4. Results and Discussion

Demographics of Respondents

The demographic profile of respondents includes gender, age, and semester level. There were 124 valid responses for data analysis. Approximately 84% of respondents were female (n=103) and the remaining were male students (n=20; 16.1%). The respondents were between the ages of 20 and 37 years old, with 77.4% (n=96) respondents being below 23 years old and 22.6% (n=28) were 24 years old and older. Students from Semester 1 to 6 participated in this study. More than 20% of them were from Semester 2 (n=36; 29%) and Semester 5 (n=28; 22.6%). Less than 10% were from Semester 6 (n=11; 8.9%) and Semester 1 (n=7; 5.6%). Semester 3 and Semester 4 students were above 15% taken part in this study: 18.5% (n=23) and 15.3% (n=19), respectively.

In terms of virtual events, many of the respondents have attended virtual events from 1 to 6 times in the past 6 months (n=88; 71%) and 82.4% (n=103) went to educational events such as webinars, workshops, symposiums, conferences, etc. Other virtual events also attended by the respondents were business events (meetings, conventions, fairs, exhibitions, incentives, etc.), entertainment events (concerts, shows, award ceremonies, etc.), festival or culture events (carnivals, parades, religious rites, etc.) and sports events (virtual marathon, race, trekking, hiking, etc.), 43.2% (n=54), 36% (n=45), 34.4% (n=43) and 18% (n=23), respectively.

Descriptive analysis

Before further data analysis, reliability and normality analyses were performed. Table 1 presents the findings of the reliability analysis conducted on the instrument used in the study. Reliability analysis is used to determine the consistency of the measuring survey question used and shows the extent to which the measuring instrument can be trusted and relied on in conducting research.

Measurement of the level of reliability of a research variable can be seen from the statistical results of Cronbach's alpha value (α), a research variable used is said to be reliable if it gives values greater than 0.60. Reliability is considered poor when the Cronbach's value is less than 0.60, good if the value is at 0.70 and very good if the value is more than 0.80 (Sekaran & Bougie, 2016). Results indicate that a standard of high reliability for all the measures, spanning the variables of vividness (α = 0.903), functionality (α = 0.901), responsiveness (α = 0.829), ease of use (α = 0.905), entertainment (α = 0.934), fulfillment (α = 0.903), privacy and security (α = 0.904), social presence (α = 0.916) and overall satisfaction (α = 0.931) Hence, all items is said to be reliable to free from random error.

Table 1: Normality and Reliability Analysis

No	Variables	M	SD	Skewness value	Kurtosis value	No of items	α
1	Vividness	4.354	0.593	-0.543	-0.517	6	0.903
2	Functionality	3.724	0.911	-0.287	-0.750	4	0.901
3	Responsiveness	4.098	0.627	-0.557	-0.337	6	0.829
4	Ease of use	4.150	0.729	-0.797	0.681	5	0.905
5	Entertainment	4.192	0.687	-0.560	0.030	5	0.934
6	Fulfillment	4.219	0.601	-0.292	-0.540	5	0.903

7	Privacy and Security	4.206	0.666	-0.534	-0.075	4	0.904
8	Social Presence	4.010	0.800	-0.655	0.422	4	0.916
9	Overall Satisfaction	4.239	0.739	-0.895	1.009	3	0.931

Notes: M=Mean, SD=Standard Deviation, α =Cronbach's Alpha

Correlation analysis

Pearson correlation and linear regression tests were conducted. This section presents the influencing factors of virtual event quality on event satisfaction among attendees. First, correlation analysis was employed to assess the relationship between event satisfaction and virtual event quality, which consists of the following dimensions: vividness, functionality, responsiveness, entertainment, fulfillment, privacy and security; and social presence. Cohen's created criterion benchmarks for small (r=0.10), medium (r=0.30), and large (r=0.50) effect sizes to help interpret the relative size of the correlation magnitudes (Cohen, 2013).

The study results reported that the quality of virtual event dimensions; including vividness ($r=0.610$, $p<0.001$), ease of use ($r=0.603$, $p<0.001$), entertainment ($r=0.751$, $p<0.001$), fulfillment ($r=0.747$, $p<0.001$), privacy ($r=0.722$, $p<0.001$) and social presence ($r=0.707$, $p<0.001$) were considered to have a large positive significant correlation with event satisfaction. Functionality ($r=0.303$, $p<0.001$) and responsiveness ($r=0.470$, $p<0.001$) were found to have a medium positive correlation.

Regression analysis

Regression analysis was performed to examine the contributing factors of virtual event quality towards event satisfaction among attendees are presented in Table 2. The findings reported that 71% of the variance in overall satisfaction is explained by the virtual event quality dimensions in the model. The findings also reveal the standard regression output indicating the effects of individual predictor variables on the dependent variables. The quality of virtual event dimensions including functionality, entertainment, fulfillment, privacy and security and social presence; significantly predicted overall satisfaction. The dimensions of virtual event quality also explained a significant proportion of variance in overall satisfaction, $R^2 = 0.713$, Adjusted $R^2 = 0.693$, $F(8, 115) = 35.653$, $p<0.001$).

The data findings indicated that the standardized coefficients for functionality, entertainment, fulfillment, privacy and security and social presence were -0.152, 0.226, 0.278, 0.219, and 0.244, respectively. The standardized coefficients indicate the strength and direction of the relationship between the predictor variables and dependent variables. Therefore, it can then be interpreted that for each one-unit increase in entertainment level, satisfaction increases by approximately 23%. Similarly, each one-unit percent increase in fulfillment level corresponds to an increase in satisfaction of about 28%. Likewise, a one-unit increase in privacy and security level corresponds to an increase of about 22% and each one-unit increase in social presence level corresponds to an increase in satisfaction of about 24%. However, for each one-unit decrease in functionality level, satisfaction decreases by approximately 15%.

Table 6 shows a regression analysis between the stated factors and the event satisfaction variable. From the regression analysis, it was found that factors such as vividness, functionality, entertainment, fulfillment, privacy and security and social presence were said to have a significant relationship with the respondent's event satisfaction ($p < 0.05$). In terms of vividness, approximately 21% of the respondents are more likely to be satisfied with the event's vividness ($p = 0.016$, coef: 0.214). The finding was concurred by various studies that have examined the quality of virtual events (D. Kim & Ko, 2019; J.-H. Kim et al., 2021). In a study examining virtual reality (VR), vividness was found to significantly enhance perceived enjoyment, leading to greater user satisfaction (D. Kim & Ko, 2019). Moreover, the application of vividness in virtual events has increased the sense of presence, which further enhances the immersive experience and in turn, improves the overall satisfaction of attendees (J.-H. Kim et al., 2021). In addition to that, an e-service quality study, including aspects like vividness and responsiveness, revealed a significant impact on virtual event satisfaction (D. Kim & Ko, 2019).

Table 2: Regression analysis

No	*Variable*	*B*	*SE B*	*Beta*	*t*	*p*	*95% CI*	
1	Vividness	0.214	0.087	0.172	2.446	0.016*	0.041	0.387
2	Functionality	-0.152	0.050	-0.188	-3.026	0.003*	-0.252	-0.053
3	Responsiveness	0.003	0.076	0.003	0.045	0.964	-0.148	0.155
4	Ease of use	0.013	0.082	0.013	0.160	0.873	-0.150	0.176
5	Entertainment	0.226	0.102	0.210	2.214	0.029*	0.024	0.429
6	Fulfillment	0.278	0.132	0.226	2.107	0.037*	0.017	0.540
7	Privacy and Security	0.219	0.104	0.197	2.106	0.037*	0.013	0.424
8	Social Presence	0.244	0.073	0.264	3.346	0.001*	0.099	0.388

The functionality of the event does have a positive association with event satisfaction. However, 15% of the respondents were less likely to agree with the functionality of the event to increase their satisfaction ($p = 0.003$, $\beta = -.0152$). The finding was found to contradict the study about event venue satisfaction which listed the functionality of the event services cape as one of the drivers of the attendees' event satisfaction (Talantis et al., 2020). These findings emphasize that the technical functionality and user experience design of virtual event platforms are key determinants of attendee satisfaction, underscoring the need for event organizers to prioritize these aspects. Yozcu, Kurgun, and Bağıran (2023) found that the functionality of virtual event platforms, including ease of use, accessibility, and the effectiveness of features like networking tools and content delivery, plays a significant role in enhancing attendee satisfaction. When virtual event platforms are functional and user-friendly, they significantly contribute to the overall positive experience and satisfaction of attendees. highlighted the importance of event functionality in ensuring attendee engagement and satisfaction (Yozcu et al., 2023). The research showed that a well-functioning virtual platform, which provides seamless interaction and reliable performance, directly correlates with higher levels of attendee satisfaction (Talantis et al., 2020). Functional aspects like event navigation, interactive features, and the overall stability of the platform are thus crucial in reducing user frustration and enhancing satisfaction. However, this study found that ease of use did not significantly influence the virtual environment satisfaction of the attendees ($p=0.873$)

As for entertainment and fulfillment, the variable was found to be significant in influencing attendee satisfaction when attending an event. About 22% and 28% of the respondents were more likely to be satisfied when there were fulfillment and entertainment dimensions in the event they attended respectively ($p = 0.029$, $\beta = 0.226$; $p = 0.037$, $\beta = 0.278$). The finding is consistent with few literature reviews (Kim & Ko, 2019; Kim et al., 2021) (Kim & Ko, 2019. A study found that incorporating engaging and interactive content, such as gamified experiences and personalized entertainment, plays a crucial role in enhancing the overall satisfaction of attendees at virtual events (Jung et al., 2024). For instance, events that blend educational content with interactive elements and entertainment options, like live polls, quizzes, and networking opportunities, create a more engaging experience that fulfills attendees' expectations. This combination of entertainment and engagement not only keeps participants interested but also fosters a deeper connection with the event, leading to a higher satisfaction level (Song et al., 2024). Moreover, gamification has been shown to significantly impact attendee satisfaction in virtual events. By integrating game elements into the event structure, such as point systems, leaderboards, and rewards, attendees often experience increased motivation, engagement, and enjoyment. Studies indicate that gamification in virtual environments not only enhances user interaction but also boosts overall satisfaction by making the experience more immersive and interactive. Recent research highlights that gamification positively influences satisfaction, engagement, and motivation in virtual learning environments (Zhang et al., 2019). This suggests similar benefits can be expected in virtual events, where gamification can transform passive participation into active involvement, leading to a more satisfying experience for attendees.

Privacy and security do have a positive association with event satisfaction. Privacy and security are increasingly recognized as critical factors influencing attendee satisfaction in virtual events. Research has demonstrated that clear privacy policies and robust security measures significantly enhance user trust and overall satisfaction (Flowers & Gregson, 2012). A study emphasizes that privacy and security concerns directly affect users' trust

in digital platforms, which in turn impacts their satisfaction and willingness to engage with the event (Gal-Or et al., 2018). Similarly, a study in the context of online learning revealed high levels of concern about online privacy and the students were reported to be reluctant to have their webcams on for a variety of reasons, often concerned with the privacy of personal information (Almekhled & Petrie, 2024). Complex, unexpected relationships were also found between online privacy and security concerns and trust. Moreover, social presence was found to be a significant factor influencing the event satisfaction among attendees to virtual events in the current study. This finding is consistent with recent research that highlights the significance of social presence in enhancing attendee satisfaction during virtual events. Social presence, which involves the perception of being "with" others in a virtual space, plays a crucial role in fostering a sense of community and engagement. A systematic literature review found that higher levels of social presence, facilitated by interactive features, directly correlate with increased satisfaction and engagement in virtual environments (Oh et al., 2018).

5. Conclusion

Event satisfaction is one of the essential dimensions that makes the attendees re-attend the event if it is held in the future. As the repeat and loyal consumer is key to establishing a customer base in any business or event, the organizer would need to create a considerable amount of satisfaction in the attendees to allow repetitive purchase behavior to the event organization in the future (Xu, 2020). Based on the findings, future virtual events should incorporate various improvements, especially in the entertainment part of the event. More attendees will be attracted to re-attend the virtual event if the event creates memorable activities and more real and hands-on events rather than just a speech.

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