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A new contextual and comprehensive application of the UTAUT2 model post-COVID-19 pandemic in higher education

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Abstract

This study examines tertiary students' behavioural intention to resume face-to-face mode of study, post-COVID-19. A modified UTAUT2 model of nine factors and a moderator is used to investigate the impact of these factors on developing country's tertiary students' behavioural intention. The influence of these students' behavioural intention on se behaviour is also examined. Using a quantitative research approach, data were gathered from 419 students at a regional university using convenience sampling technique. Data were analysed to test and validate the proposed model using covariance-based structural equation modelling. The study's findings reveal significant positive relationships between social influence, hedonic motivation, facilitating conditions, commitment, behavioural intention and use behaviour. However, it did not find performance expectancy, effort expectancy, price value, trust and comfortability, reporting any significant positive influence on behavioural intentions. Additionally, the moderating analysis shows that COVID-19 fear did not moderate or strengthen the association between behavioural intentions and use behaviour, given the insignificant interaction effect of COVID-19 fear. This study provides novelty in the contextual application of the modified UTAUT2 model, post-COVID-19. The addition of three additional constructs (trust, commitment and

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comfortability) has further improved the predictive power of the model. Lastly, the new construct that emerged in recent literature, COVID-19 fear, has been tested for the first time within the UTAUT2 model as a moderator between behavioural intentions and use behaviour. In terms of practical implications, this study first adds to the current literature on higher education, after the COVID-19 situation, being useful to education scholars. Second, it also offers specific suggestions to educational institutions and policymakers who fund universities. Such suggestions include: involving students' families in orientation and open day events, featuring family and friend support in promotional activities, upgrading facilities, including more teaching and learning sessions with team-based assessments, encouraging comfortable interactions and continuously practising COVID-19 safety protocols.

1 | INTRODUCTION

The deadly coronavirus, COVID-19 has substantially affected the usual and normal way of living, the world across. It has had a major impact on students of higher education institutions (Crawford et al., 2020; Wang et al., 2020). Government-imposed lockdowns greatly hampered the delivery of face-to-face teaching and learning activities. The closure of educational institutions then prompted immediate transition from the traditional mode of teaching and learning (face-to-face mode of study) to full online study. Digital technologies in the form of video classrooms, Zoom, MS Teams, Moodle and so on (Zacharis & Nikolopoulou, 2022) helped ensure continued delivery of teaching and learning activities (Crawford et al., 2020; Iqbal et al., 2022). Despite universities having some experience with distance and flexible education, the challenge lay in the application of online education on a larger scale since many students did not have any prior online learning experience before the pandemic (Zacharis & Nikolopoulou, 2022). The subsequent transition to full online learning, while providing new avenues to learning also brought with it some challenges to students' learning experiences (Curelaru et al., 2022; Tarc, 2020). Students still seem to lean towards traditional lectures (Chen et al., 2022). Tarc (2020) argued that physical interaction and social connectedness are necessary in student learning. A study by Eltayeb et al. (2020) found that majority of the students (69%) prefer face-to-face lecture delivery with minimal e-learning components. With the waning effect of the pandemic, universities have begun to resume face-to-face teaching and learning activities. With the return to normalcy and resumption of the traditional learning settings of face-to-face mode, it is important to understand how students are liking/disliking this shift, post-COVID-19.

This study aims to examine tertiary students' behavioural intentions (BI) to resume face-to-face mode of study, post-COVID-19 at a developing country's university setting, the University of the South Pacific (USP). USP is a regional South Pacific university with its main campus in Fiji, a Pacific Island Country (PIC). Studies investigating the resumption of face-to-face mode of study, post-COVID-19 are rare. What is even rarer is, such studies being undertaken in this South Pacific regional university or in smaller PICs. USP is the premier higher education provider in the South Pacific and is co-owned and governed by 12-member countries in the Pacific (USP, 2022a). Because USP had prior experience in distance and flexible learning since 1970 and online learning since 2000, it was able

to transit to online mode within a short period of time (USP, 2022b). When resuming face-to-face studies, USP upheld all COVID-19 protocols and safety measures mandated by the Fijian Government such as practising social distancing, wearing face masks, erecting sanitizing stations for safe hygiene, etc (USP, 2022b).

Many researchers have investigated education during the pandemic situation. As per Iqbal et al. (2022), extant literature on students' BI regarding teaching and learning during the pandemic emerged from countries like USA, Europe and China but these vary greatly, both culturally and socially. ICT infrastructure is also not comparable between developed and developing countries and poses diverse challenges (Iqbal et al., 2022). Iqbal et al. (2022) further highlighted that literature is somewhat limited to studies on certain university faculties and disciplines only. The present study gathered responses from students of three largest faculties at USP. This study argues that the experience during COVID-19 could have changed students' BI and use behaviours (USEB) when resuming face-to-face mode of study after the pandemic situation. This study, therefore, aims to address the following research questions: (1) How do the fundamental Unified Theory of Acceptance and Use of Technology (UTAUT2) factors of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation and price value influence tertiary students' BI towards resumption of face-to-face mode of study, post-COVID-19; (2) How do the three additional factors of trust, commitment and comfortability influence tertiary students' BI towards the resumption of face-to-face mode of study, post-COVID-19 and (3) How does the moderator of COVID-19 fear influence the relationship between tertiary students' BI and USEB towards the resumption of face-to-face mode of study, post-COVID-19.

In developing countries' higher educational institutions where traditional style of teaching and learning still prevails, it is not only important to understand their e-learning systems (Ali et al., 2018; Baroud & Abouchedid, 2010) but also how it fits with their concurrent traditional mode of teaching and learning when resuming face-to-face studies, postpandemic. A thorough review of literature shows that previous research has given very little attention to investigating tertiary students' BI and USEB when resuming face-to-face mode of study, post-COVID-19. Past studies (e.g., Ali et al., 2018; Curelaru et al., 2022; Iqbal et al., 2022; Naik et al., 2021; Raza et al., 2021, 2022) have particularly focused on students' e-learning experiences, some prior to and some during the pandemic situations. While there are various studies on tertiary students, the UTAUT2 model with different additional variables, the three variables of trust, commitment and comfortability as well as studies on pre- and during COVID-19 situation, the present study is unlike these prior studies. Literature is also indicative of COVID-19 fear hindering the resumption of face-to-face studies; however, such claims have not been well validated. Most research (e.g., El-Masri & Tarhini, 2017; Eneizan et al., 2019; Gupta et al., 2018; Raza et al., 2020; Raza & Khan, 2022; Singh & Matsui, 2017) have either used trust as an additional variable for the UTAUT2 model or have studied trust as a mediator of BI in different contexts, including blended learning, during COVID-19. There is no evidence of commitment and comfortability variables extending the UTAUT2 model except for few deliberations on commitment by Guoyan et al. (2021) and Raza et al. (2021) and comfortability by Muangmee et al. (2021) and Raza et al. (2020) in education or in other contexts (Aranyossy, 2022).

The present study differs from prior studies as follows. First, it is premised on one of the only two regional universities in the world (USP, 2022a), in a smaller South Pacific developing country context that is underexplored in this research area. USP has been using e-learning systems in parallel to the traditional style of pedagogy. It has also resumed the face-to-face mode of study that includes some e-learning tools. Secondly, the study is amongst the first few to investigate tertiary students' BI and USEB when resuming face-to-face mode of study, post-COVID-19. This study is not about the online mode of study or situations prior to or during COVID-19. It is not only important to examine students' attitudes about e-learning, but also important to examine their preferred study modes, following the pandemic too, not only during the pandemic (Zacharis & Nikolopoulou, 2022). Thirdly, this study is also the first to present a modified UTAUT2 model in a new context (i.e., post-COVID-19 situation in a smaller developing PIC context), incorporating three variables of trust, commitment and comfortability as well as a moderator variable, COVID-19 fear that has emerged only recently in literature (Ahorsu et al., 2022; Cantero-Garlito et al., 2021; Raza et al., 2021) between BI and USEB. Most studies have no moderator at all, apart from a

few demographic factors. A recent study by Cantero-Garlito et al. (2021) has called for additional research on the impact of COVID-19 fear on academic performance, both during the pandemic with full online study as well as when resuming the traditional face-to-face mode of study. An earlier study by Raza et al. (2021) did test the effect of this moderator but between the UTAUT independent variables and BI.

In terms of practical implications, this study not only adds to literature on higher education being useful to education scholars but also offers specific suggestions for higher educational institutions as well as policymakers who fund such institutions.

2 | LITERATURE REVIEW

2.1 | Theoretical background

The UTAUT2 model underpins the theoretical framework for this study with three additional constructs of trust, commitment and comfortability.

Developed by Venkatesh et al. (2003), the earlier UTAUT model (UTAUT1) consisted of four fundamental constructs as the main determinants for intention and acceptance use of information technology (Zacharis & Nikolopoulou, 2022, p. 3). These include performance expectancy, effort expectancy, social influence and facilitating conditions. Venkatesh et al. (2012) later extended the UTAUT1 model by adding three other constructs, namely, hedonic motivation, price value and habit, this being the UTAUT2 model.

Scholars like Al-Fraihat et al. (2020), Farooq et al. (2017) and Kumar and Bervell (2019) have employed the UTAUT1 model in higher education contexts in relation to technology acceptance and use (e.g., e-learning). Other contexts where the later developed UTAUT2 model has been explored include internet/mobile banking (e.g., Arenas Gaitán et al., 2015; Kwateng et al., 2018), online gaming (e.g., Ramírez-Correa et al., 2019), artificial intelligence (Gansser & Reich, 2021) etc. Additionally, previous research (e.g., Lahrash et al., 2021) has stated that UTAUT2 model is highly relevant in examining the adoption of e-learning technologies.

The developers of the theory encouraged researchers to explore and validate this theory with various technologies, contexts and participants (Zacharis & Nikolopoulou, 2022, p. 3). While the UTAUT model has largely been used in studies focusing on the use of technology (e.g., Al-Fraihat et al., 2020; Gansser & Reich, 2021), the present study still deems it useful in face-to-face settings. This is because certain technologies such as learning management systems (LMS) and lecture capture system have enhanced the face-to-face teaching and learning activities that both students and teachers are expected to use (Saleem et al., 2016). Face-to-face mode of studies do include a certain level of technology, though not to the extent used in full online studies.

2.2 | Empirical studies

While remote online education during the pandemic was deemed the safest mode of learning and teaching and was not really a new phenomenon, the abrupt change to full online learning was frightening and demanding for students and teachers (Stoian et al., 2022). Not surprisingly, students worldwide reported contradictory feelings about full online learning. Comfort, flexibility, cost saving and time management (Curelaru et al., 2022; Popa-Velea et al., 2021) were cited as positives while stress, isolation, loneliness, lack of concentration and low motivation (Curelaru et al., 2022; Popa-Velea et al., 2021) were reported as negatives. Tarc (2020) stated that students who prefer face-to-face learning desire social skills and are thus more engaged with their peers and teachers. A recent research by Iqbal et al. (2022) highlights face-to-face learning as more beneficial to students since many are ill-equipped for home-learning conditions. This is especially so in developing countries. It is, thus, crucial to not only examine students' attitudes about e-learning but also to also examine their other preferred modes of study,

postpandemic, not only during the pandemic (Zacharis & Nikolopoulou, 2022). As it is, with the waning effect of the pandemic, universities have begun to resume face-to-face teaching and learning activities.

The present study does not deny that there are numerous studies on tertiary students, education, the UTAUT2 model with additional variables as well as many studies on pre- and post-COVID-19. However, our study contributes and differs in that it incorporates the variables of trust, commitment and comfortability to enhance the explanatory power of UTAUT2. Prior to our study, the UTAUT2 has never incorporated or tested the three variables collectively in a single research for any academic study. Several research (e.g., El-Masri & Tarhini, 2017; Eneizan et al., 2019; Gupta et al., 2018; Raza et al., 2020; Raza & Khan, 2022; Singh & Matsui, 2017) have used trust. However, they used trust either as an additional variable of the UTAUT2 model or as a mediator of BI within the context of internet/mobile banking, online shopping, tourist adoption of smartphone apps, blended learning, student performance and cloud computing, and student behaviour and mobile learning during COVID-19. Trust is also explored in this study but within a novel context of a South Pacific country's tertiary students' resuming face-to-face mode of study, after the COVID-19 situation. Furthermore, there seems to be no evidence in extant literature on commitment and comfortability variables extending the UTAUT2 model. This study also explores these as additional variables. There have been few deliberations, nonetheless, on the commitment variable by Guoyan et al. (2021) and Raza et al. (2021). Guoyan et al. (2021) focused on the use of LMS to support learning during COVID-19, examining how this increased both student and teacher commitments and their overall educational experience. Raza et al. (2021) discussed commitment as part of students' BI for accepting and using LMS during COVID-19. In contrast, the present study contends that even in the post-COVID-19 context, students BI will most likely increase with face-to-face mode of study if they feel a sense of belonging to it and are happy to use it. Lastly, comfortability has been discussed in some studies to help explain students' BI towards e-learning tools using the UTAUT2 model (e.g., Muangmee et al., 2021) or students' BI towards using social networking sites for educational purpose (e.g., Raza et al., 2020) or within the contexts of internet banking and digital entertainment industry (e.g., Aranyossy). In their later study, Raza et al. (2022) also used UTAUT2 model but incorporated social isolation as a variable, exploring factors affecting students' acceptance and use of blackboard learning system in Pakistan during COVID-19, which is again, not similar to the present study.

As Ali et al. (2018) rightly point out, USEB and the acceptance of technology can be affected by various factors such as cultural differences, social influence, individual perception etc. making each country's context different. The present study investigates a South Pacific developing Pacific island country's tertiary students' BI and USEB when resuming face-to-face mode of study (that includes some e-learning tools), post-COVID-19. The university being studied in this paper is a regional university with 12 South Pacific member countries. This different context will bring about a deeper understanding of the impacts of relevant UTAUT2 variables including the additional three variables.

In addition, the moderating factor of COVID-19 fear that tests the association between BI and USEB within the UTAUT2 theory is also amongst the first few studies to do so. The perusal of literature highlights a dearth of research on investigations on moderator in most studies (Dwivedi et al., 2011; Taiwo & Downe, 2013). Largely, most studies have not used any moderator apart from a few demographic factors except for few studies like Raza et al. (2021). They tested the effect of this moderator but between the UTAUT2 independent variables and BI, not between BI and USEB. A recent study by Cantero-Garlito et al. (2021) has called for more research on the impact of COVID-19 fear on academic performance both, during the pandemic with full online study as well as when resuming the traditional mode of learning. Studies like those by Raza et al. (2022) also utilized UTAUT, but excluded hedonic motivation and added social isolation as an additional variable with corona fear as the moderator between independent variables and BI. Raza et al. (2021) have also called for more studies on coronavirus's influence on e-learning and for studies in other developed as well as developing countries. As such, the COVID-19 fear construct has been added as a moderator in this study.

Overall, the present study investigates the tertiary students' BI to resume face-to-face mode of study that includes some e-learning tools, after the uplifting of lockdowns in a South Pacific developing country's regional

university. This empirical setting is tested using the modified UTAUT2 model with COVID-19 fear as the moderator between BI and USEB.

2.3 | Hypothesis development

2.3.1 | Performance expectancy

Performance expectancy (PE) is the degree to which a person believes that a system will be useful in improving performance (Venkatesh et al., 2003; Zwain, 2019). It is the primary component that supports the adoption and continuous use of a certain technology. However, the relationship between PE and BI has been found to be inconsistent in various contexts and this may be because of the different study contexts, the techniques used and study sample size (Ali et al., 2018). For example, while some studies reported a favourable association between PE and students' BI when adopting LMS (Abbas, 2018; Ali et al., 2018; Althunibat, 2015; Decman, 2015; Raza et al., 2021, 2022; Tarhini et al., 2014), a few did not report any positive impact (Zwain, 2019). Some even reported that PE is the strongest predictor of BI when using technology (Hoi, 2020; Mehta et al., 2019; Zacharis & Nikolopoulou, 2022). Such inconsistencies in results do warrant further research. Also, since face-to-face mode of study does include some form of e-learning tools and students did have some experience with such tools enhancing their performance during lockdown, it is hypothesized that:

> **H1.** Performance expectancy has a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

2.3.2 | Effort expectancy

Effort expectancy (EE) can be generally described as the simplicity and ease of using a system (Venkatesh et al., 2003). Users believe that a system would be easy to use and understand when performing their duties (Rudhumbu, 2022). Not only is EE an important predictor of adoption of new technologies in the technology acceptance models (Cengiz & Bakırtaş, 2020), but it also enhances the adoption of new technology amongst students (Huang et al., 2022). However, previous studies report inconsistencies in the relationship findings between EE and BI which may be because of different study contexts, techniques used and sample size (Ali et al., 2018). For instance, Chinyamurindi et al. (2017) and Zwain (2019) found that EE had no effect on students' BI when using LMS. However, Althunibat (2015), Azizi et al. (2020) and Raza et al. (2022) found a positive relationship between EE and BI of users even in traditional learning systems with some form of technological support. Similarly, Ali et al. (2018); Jakkaew and Hemrungrote (2017), Raza et al. (2021) and Tarhini et al. (2014) found that EE does influence students' BI towards e-learning. Such inconsistencies in previous research results do call for further research. The present study postulates that some technologies that are used in all modes of study can influence students' BI in the post-COVID-19 context towards face-to-face studies. Thus, the following hypothesis:

> **H2.** Effort expectancy has a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

2.3.3 | Social influence

Social influence (SI) is the degree to which important individuals influence a person's BI to use technology (Venkatesh et al., 2003, 2012). Several studies have found a positive relationship between SI and students' BI

to use LMS (Fidani & Idrizi, 2012; Gruzd et al., 2012; Gupta et al., 2008; Im et al., 2011; Raza et al., 2021, 2022; Venkatesh et al., 2003; Widjaja et al., 2020) and to use video-based learning media support (Wijaya et al., 2022). The same is expected in this study. In the post-COVID-19 context, students will be influenced by the opinions of their significant others such as family, friends, lecturers/tutors and educational institutions (Rudhumbu, 2022) when resuming face-to-face mode of study. It is, thus, hypothesized that:

> **H3.** Social influence has a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

2.3.4 | Facilitating conditions

Facilitating conditions (FC) is the availability of adequate organizational infrastructure and resources to support the use of technology (Zacharis & Nikolopoulou, 2022). In an educational context, FC includes students' access to technological devices such as Wi-Fi, high-speed internet broadband service, personal computers, laboratories with the needed equipment (Tarhini et al., 2014), laptops, smartphones, stable internet connection, technical support and the knowledge of using the available technology. These, in turn, lead to increased BI and USEB of e-learning technologies, allowing students to perform better, enhancing their e-learning system acceptance levels (Ali et al., 2018; Tarhini et al., 2014; Venkatesh et al., 2003). Students as well as teachers will be demotivated in the absence of such timely resource support (Yeop et al., 2016). Similar to PE and EE, literature highlights some inconsistencies between past studies on the impact of FC on BI. This may be because of economic, developing and technological status of countries and universities. For example, some studies (e.g., Bakar et al., 2013; Lu et al., 2020; Raza et al., 2022) have shown FC impacting BI and USEB when engaging in technologically enhanced learning environments while studies like Dwivedi et al. (2011), Lai Wah and Hashim (2021), Raza et al. (2021), Shao and Lee (2020) and Venkatesh et al. (2003) found FC insignificant. Such inconsistencies in previous research results do warrant further research. The present study argues that in the post-COVID-19 context, students may compare their prior experience with such technologies during the pandemic with the post-COVID situation. This could determine their BI when using such technologies upon the resumption of face-to-face mode of study. We, thus, hypothesize that:

> **H4.** Facilitating conditions have a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

2.3.5 | Hedonic motivation

Hedonic motivation (HM) is the pleasure, enjoyment, happiness and overall positive attitude an individual experiences when using a particular technology (Chao, 2019; Sitar-Taut & Mican, 2021; Venkatesh et al., 2012). Like PE, EE and FC, literature reports some inconsistencies between past studies on the impact of HM on BI, justifying further research. For instance, Zwain (2019) and Hoi (2020) found HM impacting BI as well as USEB while researchers like Raza et al. (2022) reported insignificant impact of HM on BI in contexts where technology enhances learning. Nonetheless, Raza et al. (2021) suggested that HM still be given importance and tested for its effect on students' performance in future studies. In the post-COVID-19 context, the present study argues that students may experience pleasure and be happier with face-to-face mode of study that has some level of technology including interactions with others, enhancing their BI. In contrast, during the COVID-19 situation given lockdowns, students reported stress, isolation, loneliness, lack of concentration and low motivation (Curelaru et al., 2022; Popa-Velea et al., 2021) which could have led to lower HM during that time. Hence, it is hypothesized:

H5. Hedonic motivation has a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

2.3.6 | Price value

Price value (PV) refers to the cost–benefit analysis of using technology, where users find it worthwhile to use a given technology as opposed to the costs incurred when utilizing it (Raman & Thannimalai, 2021; Venkatesh et al., 2012). Students go for cheaper as well as useful technology (Sharma et al., 2020). Higher prices hence lower the intention of adopting technology since daily use of it over a longer period of time will become even more expensive (Raza & Khan, 2022) for students. Similar to PE, EE, FC and HM, literature highlights some inconsistencies between past studies on the impact of PV on BI, necessitating further research. Studies (e.g., Alalwan et al., 2017; Moorthy et al., 2019) found a significant relationship between PV and BI in technology-supported learning while authors like El-Masri and Tarhini (2017) found the relationship insignificant. In this study context of post-COVID-19, it is argued that for the students who believe that benefits of studying face-to-face outweigh the costs of using technology, BI will increase. In contrast, during the pandemic, most of these students were either cut off from free internet access provided by the university or faced connectivity issues in remote areas (Simamora, 2020). Therefore, it is hypothesized that:

H6. Price value has a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

2.3.7 | Trust

Gefen et al. (2000, p. 161) described trust, commitment and comfortability as an individual's willingness to depend on something, based on their beliefs on ability, benevolence and integrity. Individuals use trust as a mechanism to minimize their concerns while using a particular system (Tarhini et al., 2017). The absence of user interaction with a human element is likely to increase perceived risks of using a system. Trust, therefore, creates a mutual relationship between students and the mode of study. Pérez-Macías et al. (2019) purported that trust levels have increased over time in face-to-face learning because of the benevolence and integrity of the system. This study argues that in the post-COVID-19 context, students will most likely increase their BI if they trust the available technological support systems (Hanif et al., 2022) in face-to-face study modes. It is, thus, hypothesized that:

H7. Trust has a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

2.3.8 | Commitment

As per Sánchez-Franco and Martín-Velicia (2011), there are two types of commitment, namely, affective and calculative commitment. Affective commitment is most effective when building mutually beneficial relationships between the user and the system. This is because it entails the expression of emotions such as loyalty, belonging, affiliation and the desire to retain a relationship given the delight of being in it (Sánchez-Franco & Martín-Velicia, 2011). Guoyan et al. (2021) found that the use of LMS to support learning during COVID-19 increased both the student and teacher commitment and their overall educational experience. The present study contends that in the post-COVID-19 context, students are also likely to increase their BI with the system and mode of study if they feel a sense of belonging to it and are happy to use it. Thus, it is hypothesized that:

H8. Commitment has a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

2.3.9 | Comfortability

Comfortability is described as the level of comfort students experience with their classmates, instructor and course materials (Kiener et al., 2014). The context of comfortability has been extended to the use of a particular system too (Naik et al., 2021; Tandon et al., 2022) or with the changes in the environment (Sheth, 2020). For example, researchers like Silva et al. (2022) investigated whether individuals would return to old habits, post-COVID-19. This included the idea of online education—whether it is a long-term solution to student learning or whether individuals would return to traditional modes of learning, owing to its distinctive characteristics. Arain et al. (2019) argued that if users are comfortable using technology, they will most likely continue to use it in the future. Accordingly, the present study argues that based on the level of comfort experienced with the system during the pandemic, students' BI will most likely also increase post-COVID-19 when resuming face-to-face mode of study. As such, it is hypothesized that:

H9. Comfortability has a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19.

Behavioural intention and use behaviour
Behavioural intention (BI) refers to the motivational factor that drives a user to use a particular system or technology in the future while use behaviour (USEB) is the actual use of that system or technology (Venkatesh et al., 2003). Extant studies (Azizi et al., 2020; Motaghian et al., 2013; Raza et al., 2021, 2022; Wang & Wang, 2009) found a strong relationship between BI and USEB in technology-supported learning. BI has been reported as the most relevant predictor of USEB that helps understand the performance of certain behaviour types and is also well supported by literature (Ali et al., 2018). This study argues that in the post-COVID-19 context, BI will influence students' intention to and continuous use of technology in their face-to-face mode of study. Students' positive technological experiences with the full online mode of study during the pandemic will influence their BI and USEB in any mode, in the future. As such, it is hypothesized that:

H10. Behavioural intention has a positive association with students' use behaviour of resuming face-to-face mode of study, post-COVID-19.

COVID-19 fear
Fear is directly associated with high infection, transmission and mortality rates caused by COVID-19 (Ahorsu et al., 2022; Lin, 2020). As a result, COVID-19 fear has caused stress, anxiety, worry and concern among individuals (Ahorsu et al., 2022). A study by Cantero-Garlito et al. (2021) that assessed the severity of fear in first-year university students when resuming face-to-face mode of study found that university students did not express fear of contracting COVID-19. Similarly, Martínez-Lorca et al. (2020) found that university students who were not in their first year of study experienced less fear when compared to the general population. This can be attributed to students' perceiving lower risk given their age, they being vaccinated and the safety precautions practised by universities, increasing their BI and USEB when resuming face-to-face mode of study, post-COVID-19. These authors attributed the level of COVID-19 fear to age and study level of students. Other authors like Perz et al. (2020) and Bitan et al. (2020) also attributed the level of fear to other demographic factors such as gender, social status and being part of the higher risk groups (having previous morbidities and/or family members suffering/dying from COVID-19). Therefore, it can be hypothesized that:

H11. COVID-19 fear has a moderating effect on the association between students' behavioural intentions and their use behaviour when resuming face-to-face mode of study, post-COVID-19.

3 | METHODOLOGY

3.1 | Research model

This research focuses on factors that have a positive association with students' behavioural intentions to resume face-to-face mode of study, post-COVID-19. The conceptual model is presented below in Figure 1. The model includes factors of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, trust, commitment and comfortability impacting behavioural intentions and that in turn influencing students' use behaviour. COVID-19 fear is also examined as a moderator between behavioural intentions and use behaviour.

3.2 | Data collection procedure and measurement instrument

This study investigates into the factors that affect tertiary students' BI to resume face-to-face mode of study, post-COVID-19. The target participants for this study were the tertiary students of a regional university. A pilot test was carried out with 15 respondents during which few participants expressed some confusion with certain words and similarity between few questions. This led to changes in the survey questionnaire. The first set of pilot-tested questionnaires was, thus, excluded from the final dataset. Non-probability sampling including convenience sampling technique was used as this helps gather general ideas about a particular subject (Sekaran & Bougie, 2010).

The survey meets the institutional ethical research requirements of the university being studied. Respondents were assured of their rights of consent and the treatment of information—given as confidential—and only to be used for the purpose of the research and later publication. Anonymity and confidentiality were promised and
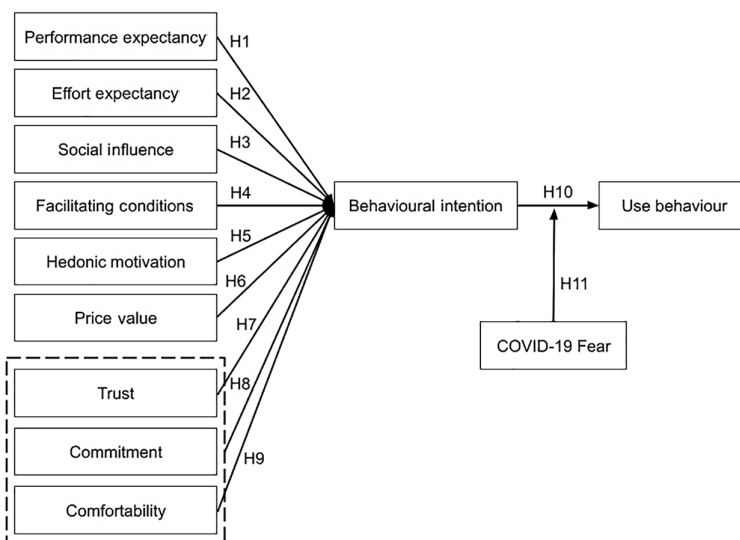

FIGURE 1 Conceptual model. The conceptual model of the study and hypothesis development.

upheld. These were stated before the questionnaires were administered. Given voluntary participation, participants could also refuse to continue with their participation if they found any question inappropriate. Overall, researchers were mindful of not causing any harm to respondents, having due regard for their privacy, respecting them as individuals and not subjecting them to unnecessary research.

The questionnaire was constructed on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree with three to six scale items. The measurement scale items of PE, EE, SI, FC, BI and USEB for the UTAUT2 model were adopted from various UTAUT1- and UTAUT2-related studies (e.g., Al-Fraihat et al., 2020; Farooq et al., 2017; Hoi, 2020; Mehta et al., 2019; Sitar-Taut & Mican, 2021; Venkatesh et al., 2003, 2012; Zwain, 2019). Additionally, the measurement scale items for TR were adopted from Gefen et al. (2000) and Slade et al. (2015). COMT scale items were sourced from Sánchez-Franco and Martín-Velicia (2011) and Thien et al. (2014) while COMF scale items were adopted from Alvarez et al. (2011) and Lin (2004). The scale items for COVID-19 fear construct have been adopted from the previously tested COVID-19 fear constructs (Ahorsu et al., 2022; Cantero-Garlito et al., 2021). This study, however, has not examined Habit as one of the constructs of the UTAUT2 model given that it is quite early for participants to indicate whether they had or would develop a habit towards face-to-face mode of study, post-COVID-19, due to the fear of pandemic. Universities have just recently resumed face-to-face mode of study.

The survey link was emailed to undergraduate (Bachelor's degree) students of the University of the South Pacific. These were the students from the three largest faculties, namely, Faculty of Business and Economics (FBE), Faculty of Science, Technology and Environment (FSTE) and Faculty of Arts, Law and Education (FALE). The survey was carried out in October 2021–January 2022 and collected 419 responses. The time spent on completing the questionnaire was approximately 9 min on average.

3.3 | Statistical technique

This study utilized SPSS v25 and AMOS v23 for analysis, tests and Covariance-Based Structural Equation Modelling (CB-SEM) for path analysis and for testing hypotheses. SEM is effective when there is a need to develop and/or expand theories that have second- and third-order factors. It is this that leads to a better understanding of causal relationships (Astrachan et al., 2014). AMOS was used to test the extended model of UTAUT2 with confirmatory factor analysis, where CB-SEM appears more applicable. This helps with the development of scales, exploratory and confirmatory analysis, latent constructs' relative salience as well as helps to evaluate causal relationships (Byrne, 2010). Like Ali et al. (2018) study, this study used structural equation modelling (SEM) approach, unlike prior studies that used different statistical approaches (Ali et al., 2018).

3.4 | Demographics

Table 1 provides the demographic characteristics of the study's sample. Of the 419 respondents, 66.6% were females while 33.4% were males. 25.5% of this study's sample were aged older than 16 years, 65.9% between 21 and 30 years, 6.2% between 31 and 40 years and 2.4% between 41 and 50 years. Demographic findings of this study are similar to several studies, in the range of 350–450 responses. For example, 358 responses in Moorthy et al. (2019); 432 responses in Rudhumbu (2022); 387 responses in Stoian et al. (2022) and 366 responses in Tarhini et al. (2017). Various researchers state three or more items per variable with a sample size of 100 being enough for convergence (Raza et al., 2019). As per Anderson and Gerbing (1984), for convergent and proper solution, a sample of 150 will suffice while Iacobucci and Churchill (2010) suggest samples of 50–100 being adequate for SEM. Furthermore, as per Comrey and Lee (2013), Raza and Hanif (2013) and, Sharif and Raza (2017), a sample of 50 is a poor sample, 300 is good while 500 is very good and 1000 is excellent for factor analysis. The present

TABLE 1 Respondent profile.

Demographic variable	N	%
Gender		
Male	140	33.4
Female	279	66.6
Age		
>16	107	25.5
21–30 years	276	65.9
31–40 years	26	6.2
41–50 years	10	2.4
Level of study		
100 level	142	33.9
200 level	17	4.1
300 level	259	61.8
400 level	1	0.2
Faculty		
FBE	347	82.8
FSTE	46	11.0
FALE	24	5.7
More than 1 faculty	2	0.5
Residential area		
Urban	307	73.3
Semi urban	81	19.3
Semi rural	9	2.1
Rural	22	5.3

Note: The demographic characteristics of the study's sample.

study's sample of 419 is, thus, deemed sufficient to perform estimations as it falls between a good and very good sample.

4 | DATA ANALYSIS AND RESULTS

4.1 | Data analysis

Prior to all analysis, the dataset was checked for missing values and outliers, using the data screening procedure. Frequency tests using SPSS v25 of all variables showed 17 (4%) missing values in two demographic variables, four missing under Level of Study and 13 missing under Faculty. The missing values were replaced with mode values of the same demographic variables. One outlier was revealed in the EE1 scale. Instead of 3, 30 was entered; this was corrected to 3.

Kaiser–Meyer–Olkin (KMO) measures sampling adequacy and homogeneity of variables (Sharma, 1996) and Bartlett's test of sphericity was also computed. KMO should be >0.50 while Bartlett's test should be statistically significant (Pallant, 2020). KMO was 0.96 and Bartlett's test was significant with $p<.001$, confirming the correlation matrix's suitability for factor analysis.

Skewness and kurtosis were then computed to check data normality. Since skewness values range from −0.281 to −1.736, within the range of −2 to +2 and kurtosis ranges from −0.864 to 3.931, also within the range of −7 to +7 (Byrne, 2010), data were considered normal.

Variance inflation factor (VIF) scores of the independent variables were <10, ranging from 1.595 to 4.113 and tolerance (t) >0.1 from 0.243 to 0.627 (Paruq et al., 2021), thus multicollinearity is not an issue in this study. Common method bias of Harman's single factor test reported a variance of 49% < 50%, hence findings of this study are not affected by common method bias (Podsakoff & Organ, 1986). Further, the use of a questionnaire of 5-point Likert scale with three to six scale items including some indirect questions (Fisher, 1993) and the use of online surveys which allowed for self-completion mode and anonymity helped reduce social desirability bias.

Table 2 provides KMO, Bartlett's test, Kurtosis and Skewness and tolerance and VIF scores.

4.1.1 | Reliability and validity

Cronbach's alpha scores confirm each scale's internal consistency. For this study, all scores showed very high internal reliability, being >0.7 (Van Griethuijsen et al., 2015). The Cronbach's alpha was 0.93 for PE, 0.92 for EE, 0.91 for SI, 0.83 for FC, 0.94 for HM, 0.90 for PV, 0.91 for TR, 0.83 for COMT and 0.91 for COMF, 0.97 for BI, 0.95 for USEB and overall, 0.98.

In addition, convergent validity was established, being within the range of average variance extracted (AVE) >0.5 (Hair et al., 2016). Composite reliability (CR) scores were also >0.60 (Fornell & Larcker, 1981). For all constructs, maximum shared variance (MSV) as well as average shared squared variance (ASV) were less than AVE, with square roots of AVE greater than the inter-construct correlations, thus confirming discriminant validity (Hair et al., 2010; Hamilton & Tee, 2015). See Table 3 below.

4.1.2 | Confirmatory factor analysis

Upon the reliability and validity tests, confirmatory factor analysis (CFA) was created to assess the measurement model. Three observed variables with <0.7 loadings (Hamilton & Tee, 2015) of SI4, SI5 and COMT3 were dropped except COMT1 (0.626) since AMOS requires at least three observed variables per latent variable. Remaining loadings of >0.7 confirm content validity. A good model fit was confirmed as follows: (x^2 = 1813.10, df = 667, p < .001) x^2/df = 2.72, TLI = 0.92, IFI = 0.92, CFI = 0.92 all >0.90; PNFI = 0.80, PCFI = 0.83 both >0.5 and RMSEA = 0.06 < 0.08 (Hair et al., 2006; Schmitt, 2011).

After CFA model fit, SEM was constructed. A good model fit for SEM was also confirmed as follows: (x^2 = 3499.17, df = 1384, p < .001) x^2/df = 2.53; IFI = 0.91, TLI = 0.90, CFI = 0.91 all >0.90; PNFI = 0.80 and PCFI = 0.84 both >0.5 and RMSEA = 0.06 < 0.08 (Hair et al., 2006; Schmitt, 2011). The fit indices confirm the proposed extended model's appropriateness as a predictor of tertiary students' behavioural intention to resume face-to-face mode of study, post-COVID-19. All hypothesized relationships were then tested. The following Figure 2 and Table 4 present the SEM, regression weights, critical ratios and p-values.

The structural model was analysed by examining each standardized path that corresponds to hypotheses (Raza et al., 2019). The hypotheses with p values <.05 < .001 were considered significant with higher coefficient value (β/SRW) reflecting stronger impact of latent variable on BI. As such, COMT, HM, SI and FC were found to have significant positive results, thus supporting hypotheses H3, H4, H5 and H8, given significant p values (p < .05 < .001). Results also show a strong significant positive relationship between BI and USEB (β = 0.790, p < .001), supporting hypothesis H10. Amongst the independent variables and BI, the strongest relationship was observed with COMT (H8), reflected by the highest coefficient value (β = 0.436, p < .001), followed by HM (H5) (β = 0.286, p < .001).

TABLE 2 KMO, Bartlett's test, Kurtosis and skewness and VIF scores.

						KMO and Bartlett's test				
Kaiser-Meyer-Olkin measure of sampling adequacy									.962	
Bartlett's test of sphericity						Approx. χ^2			15,676.484	
						df			861	
						Sig.			.000	
	N	**Minimum**	**Maximum**	**Mean**	**SD**	**Skewness**		**Kurtosis**		
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**SE**	**Statistic**	**SE**	
PE1	419	1	5	4.25	.969	−1.327	.119	1.316	.238	
PE2	419	1	5	4.33	.848	−1.561	.119	3.095	.238	
PE3	419	1	5	4.06	.950	−.886	.119	.289	.238	
PE4	419	1	5	4.22	.852	−1.202	.119	1.795	.238	
PE5	419	1	5	4.32	.802	−1.363	.119	2.540	.238	
EE1	419	1	5	4.00	.978	−.878	.119	.360	.238	
EE2	419	1	5	4.02	1.023	−1.003	.119	.455	.238	
EE3	419	1	5	4.37	.821	−1.507	.119	2.692	.238	
EE4	419	1	5	4.14	.915	−.993	.119	.679	.238	
EE5	419	1	5	4.21	.853	−1.026	.119	.981	.238	
EE6	419	1	5	4.34	.875	−1.514	.119	2.471	.238	
SI1	419	1	5	4.01	.955	−.836	.119	.342	.238	
SI2	419	1	5	4.00	.957	−.860	.119	.453	.238	
SI3	419	1	5	4.05	.987	−.902	.119	.321	.238	
SI4	419	1	5	3.93	.998	−.749	.119	.030	.238	
SI5	419	1	5	3.39	1.188	−.281	.119	−.864	.238	
FC1	419	1	5	4.22	.880	−1.311	.119	1.977	.238	
FC2	419	1	5	4.29	.808	−1.239	.119	1.921	.238	
FC3	419	1	5	4.24	.837	−1.217	.119	1.709	.238	
FC4	419	1	5	4.34	.844	−1.542	.119	2.822	.238	
FC5	419	1	5	4.35	.838	−1.525	.119	2.875	.238	
FC6	419	1	5	4.39	.785	−1.582	.119	3.400	.238	
Hedonic_M1	419	1	5	4.37	.809	−1.474	.119	2.841	.238	
Hedonic_M2	419	1	5	4.39	.815	−1.736	.119	3.931	.238	
Hedonic_M3	419	1	5	4.27	.889	−1.373	.119	2.104	.238	
Hedonic_M4	419	1	5	4.26	.956	−1.357	.119	1.568	.238	
PriceVal1	419	1	5	4.24	.881	−1.207	.119	1.475	.238	
PriceVal2	419	1	5	4.32	.822	−1.186	.119	1.343	.238	
PriceVal3	419	1	5	4.32	.845	−1.320	.119	1.890	.238	
Trust1	419	1	5	4.34	.813	−1.242	.119	1.518	.238	
Trust2	419	1	5	4.21	.866	−1.175	.119	1.477	.238	
Trust3	419	1	5	4.18	.829	−1.027	.119	1.285	.238	
Trust4	419	1	5	4.17	.850	−1.053	.119	1.317	.238	
Trust5	419	1	5	4.28	.818	−1.129	.119	1.449	.238	

	N	Minimum	Maximum	Mean	SD	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	SE	Statistic	SE
Commit1	419	1	5	4.20	.810	−.888	.119	.684	.238
Commit2	419	1	5	4.04	1.032	−1.018	.119	.583	.238
Commit3	419	1	5	4.06	.959	−.959	.119	.619	.238
Commit4	419	1	5	4.17	.934	−1.189	.119	1.374	.238
Comfort1	419	1	5	4.17	.957	−1.282	.119	1.517	.238
Comfort2	419	1	5	4.21	.875	−1.293	.119	2.187	.238
Comfort3	419	1	5	4.19	.842	−1.094	.119	1.602	.238
Comfort4	419	1	5	4.18	.846	−.917	.119	.673	.238
B_Int1	419	1	5	4.22	.943	−1.207	.119	1.118	.238
B_Int2	419	1	5	4.26	.940	−1.262	.119	1.063	.238
B_Int3	419	1	5	4.16	.961	−1.153	.119	.997	.238
B_Int4	419	1	5	4.21	.957	−1.182	.119	.967	.238
B_Int5	419	1	5	4.20	.956	−1.093	.119	.581	.238
Use_B1	419	1	5	4.28	.910	−1.403	.119	1.978	.238
Use_B2	419	1	5	4.28	.892	−1.335	.119	1.809	.238
Use_B3	419	1	5	4.24	.891	−1.216	.119	1.531	.238
Use_B4	419	1	5	4.29	.876	−1.419	.119	2.344	.238
Use_B5	419	1	5	4.34	.891	−1.433	.119	1.912	.238
Fear1	419	1	5	3.83	1.166	−.936	.119	.082	.238
Fear2	419	1	5	4.27	.890	−1.442	.119	2.322	.238
Fear3	419	1	5	4.29	.924	−1.383	.119	1.674	.238
Valid N (listwise)	419								

VIF and tolerance scores

Model		Unstandardized coefficients		Standardized coefficients				Collinearity statistics	
		B	SE	Beta	t	Sig.		Tolerance	VIF
1	(Constant)	−.542	.175		−3.092	.002			
	PEAVERAGE	.045	.061	.039	.740	.460		.272	3.680
	EEAVERAGE	.115	.066	.098	1.755	.080		.243	4.113
	SIAVERAGE	.106	.040	.092	2.628	.009		.627	1.595
	FCAVERAGE	.064	.055	.050	1.158	.247		.410	2.441
	HMAVERAGE	.390	.054	.348	7.235	.000		.329	3.039
	PVAVERAGE	−.027	.045	−.023	−.591	.555		.494	2.023
	trustAVERAGE	.066	.057	.053	1.156	.248		.365	2.736
	COMMITTMENTAVERAGE	.218	.055	.186	3.999	.000		.353	2.834
	COMFORTAVERAGE	.154	.056	.134	2.729	.007		.315	3.172

TABLE 3 Validity analysis.

	CR	AVE	MSV	ASV	PE	EE	SI	FC	HM	PV	TR	COMT	COMF
PE	0.949	0.681	0.462	0.395	**0.845**								
EE	0.948	0.581	0.518	0.470	0.836	**0.798**							
SI	0.967	0.858	0.303	0.275	0.517	0.559	**0.756**						
FC	0.95	0.593	0.578	0.487	0.647	0.680	0.497	**0.803**					
HM	0.957	0.807	0.656	0.635	0.654	0.671	0.502	0.613	**0.893**				
PV	0.899	0.747	0.533	0.482	0.563	0.547	0.441	0.547	0.638	**0.864**			
TR	0.941	0.654	0.578	0.501	0.629	0.658	0.516	0.693	0.655	0.590	**0.815**		
COMT	0.855	0.503	0.504	0.410	0.610	0.623	0.489	0.608	0.699	0.626	0.691	**0.752**	
COMF	0.901	0.621	0.476	0.402	0.667	0.677	0.471	0.614	0.756	0.616	0.655	0.729	**0.845**

Note: Sqrt of AVE are the boldfaced diagonal scores. The convergent and discriminant validity of the study constructs. Abbreviations: COMF, comfortability; COMT, commitment; EE, effort expectancy; FC, facilitating conditions; HM, hedonic motivation; PE, performance expectancy; PV, price value; SI, social influence; TR, trust.
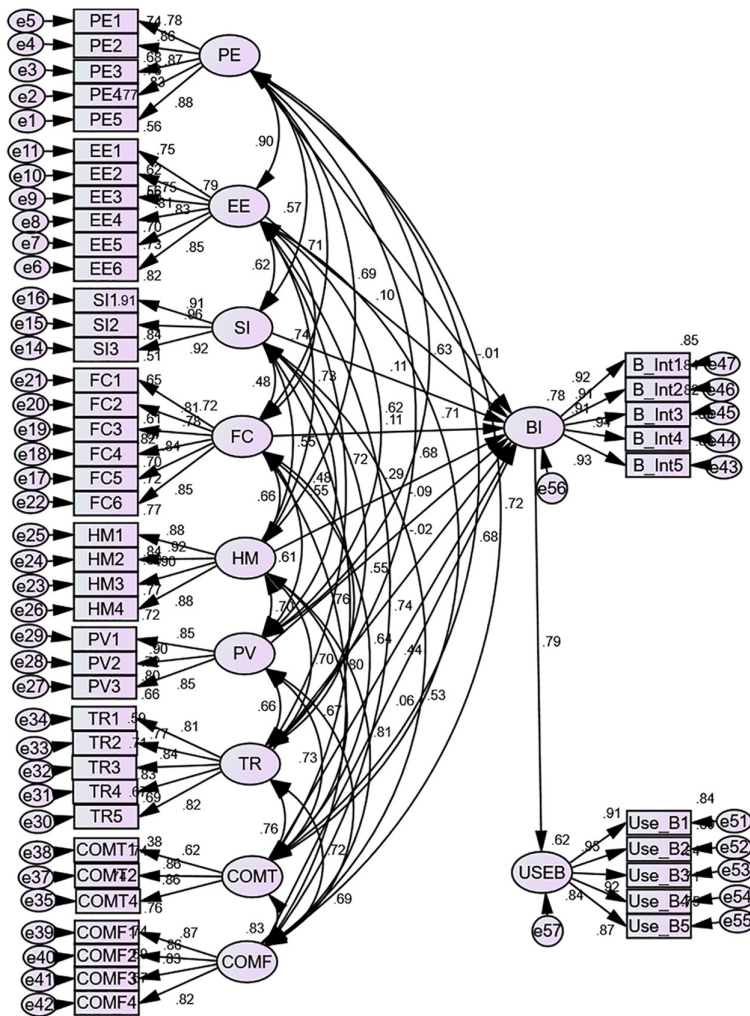

FIGURE 2 The structural equation modelling of the conceptual model.

TABLE 4 Path analysis.

	Regression path		SRW	*p*	CR	AVE	SMC
H1: rejected	BI<---PE	Effect of PE on BI	−0.008	0.925			
H2: rejected	BI<---EE	Effect of EE on BI	0.103	0.288			
H3: supported/ accepted	BI<---SI	Effect of SI on BI	0.106	**0.004**			
H4: supported/ accepted	BI<---FC	Effect of FC on BI	0.111	**0.037**			
H5: supported/ accepted	BI<---HM	Effect of HM on BI	0.286				
H6: rejected	BI<---PV	Effect of PV on BI	−0.089	0.068			
H7: rejected	BI<---TR	Effect of TR on BI	−0.024	0.687			
H8: supported/ accepted	BI<---COMT	Effect of COMT on BI	0.436				
H9: rejected	BI<---COMF	Effect of COMF on BI	0.063	0.370			
H10: supported/ accepted	USEB<---BI	Effect of BI on USEB	0.790				
	PE1<---PE	I find F2F courses more useful than online courses during the new normal.	0.785				0.616
	PE2<---PE	F2F courses during the new normal increases my chances of achieving knowledge that is more relevant to me.	0.863				0.745
	PE3<---PE	F2F courses helps me complete tasks more quickly during the new normal.	0.826				0.682
	PE4<---PE	F2F courses increases my productivity level during the present stage.	0.874				0.764
	PE5<---PE	F2F courses effectively enhances my learning during the new normal	0.875		0.949	0.681	0.766
	EE1<---EE	F2F courses make my work easier.	0.751				0.565
	EE2<---EE	F2F courses are convenient for me.	0.788				0.621
	EE3<---EE	F2F courses make my interactions with other peers and instructors more convenient.	0.748				0.56
	EE4<---EE	I find F2F courses easier to follow because it has easy instructions.	0.810				0.655
	EE5<---EE	F2F courses make me more skillful.	0.834				0.696
	EE6<---EE	I find F2F interactions more useful.	0.852		0.948	0.581	0.726
	SI1<---SI	My friends and family who are important to me influence me to study F2F courses	0.907				0.823
	SI2<---SI	My friends and family who are important to me think I should study F2F courses	0.956				0.913
	SI3<---SI	My friends and family whose opinions I value prefer that I should study F2F courses	0.916		0.967	0.858	0.839

(Continues)

TABLE 4 (Continued)

	Regression path		SRW	p	CR	AVE	SMC
	FC1<---FC	F2F courses are generally well equipped with the necessary resources (including hardware, software, network, etc.)	0.715				0.512
	FC2<---FC	It is easy to gain the knowledge (study materials) necessary for F2F courses.	0.806				0.65
	FC3<---FC	I have the necessary study materials to pursue F2F courses.	0.781				0.61
	FC4<---FC	I have easy access to F2F group interactions with my peers.	0.820				0.673
	FC5<---FC	I can easily interact with my instructors in a F2F course.	0.838				0.702
	FC6<---FC	My instructors conduct F2F courses with ease for better F2F learning.	0.850		0.95	0.593	0.723
	HM1<---HM	F2F mode of study is a good idea.	0.879				0.773
	HM2<---HM	F2F courses make classes more interesting.	0.917				0.841
	HM3<---HM	F2F courses are more fun.	0.896				0.802
	HM4<---HM	I like F2F courses more.	0.880		0.957	0.807	0.775
	PV1<---PV	I get more value for the money I pay for a F2F course.	0.847				0.718
	PV2<---PV	I get more quality education through a F2F course.	0.897				0.804
	PV3<---PV	Studying F2F courses is worth the money I pay.	0.849		0.899	0.747	0.72
	TR1<---TR	F2F courses are more trustworthy.	0.810				0.656
	TR2<---TR	I do not have any doubts with the content and delivery of F2F courses.	0.771				0.594
	TR3<---TR	Even if I was not monitored, I would still attend and do my tasks in F2F courses.	0.844				0.712
	TR4<---TR	Even if I was not monitored, I would trust F2F courses to do the job right.	0.829				0.687
	TR5<---TR	F2F courses have the ability to fulfil its task more effectively.	0.818		0.941	0.654	0.67
	COMT1<--- COMT	Despite COVID-19, I am committed to my F2F courses	0.616				0.379
	COMT2<--- COMT	I would be happy to continue F2F courses for the rest of my education life	0.863				0.745
	COMT4<--- COMT	I feel I am more committed and engaged with F2F courses	0.859		0.855	0.503	0.738
	COMF1<--- COMF	I feel comfortable with the courses going back to F2F mode in the new normal.	0.871				0.759
	COMF2<--- COMF	I feel content with F2F teaching and learning provided in the new normal.	0.857				0.735
	COMF3<--- COMF	The general learning environment created for F2F learning is more conducive.	0.829				0.687

TABLE 4 (Continued)

	Regression path		SRW	p	CR	AVE	SMC
	COMF4<--- COMF	I feel more at ease with F2F interactions in the new normal.	0.819		0.901	0.621	0.67
	BI1<---BI	I would love to continue to do F2F courses	0.924				0.854
	BI2<---BI	I like F2F courses, I would definitely do it in the future	0.915				0.837
	BI3<---BI	I am willing to participate and engage in F2F courses daily	0.908				0.825
	BI4<---BI	I intend to continue to study F2F courses in the future	0.944				0.891
	BI5<---BI	I plan to continue to study F2F courses in the future.	0.928				0.861
	UseB1<--- USEB	Studying a F2F course is more enjoyable	0.915				0.837
	UseB2<--- USEB	Studying a F2F course is more exciting	0.946				0.894
	UseB3<--- USEB	Studying a F2F course is more delightful	0.917				0.842
	UseB4<--- USEB	I am more satisfied with the effectiveness of F2F courses	0.842				0.709
	UseB5<--- USEB	Overall, I am more satisfied with the F2F mode of study	0.866				0.751

Note: The regression weights, critical ratios and *p*-values of the study constructs.

Abbreviations: BI, behavioural intention; COMF, comfortability; COMT, commitment; EE, effort expectancy; FC, facilitating conditions; HM, hedonic motivation; PE, performance expectancy; PV, price value; SI, social influence; SRW, standardized regression weight; TR, trust; USEB, user behaviour.

Results show that SI (H3) also has a positive relationship with BI ($\beta = 0.106$, $p < .05$) and so has FC (H4) with BI ($\beta = 0.111$, $p < .05$). In contrast, PE, EE, PV, TR and COMF did not report any significant impact on BI given *p* values >.05, thus not supported, rejecting hypotheses H1, H2, H6, H7 and H9. Results suggest that PE, EE, PV, TR and COMF do not significantly influence BI. In sum, hypotheses H3, H4, H5, H8 and H10 are accepted while H1, H2, H6, H7 and H9 rejected.

4.1.3 | Moderating effect of COVID-19 fear

The composite scores for BI, COVID-19 Fear and USEB were computed to establish and test the effect of the moderating factor of COVID-19 fear (Blunch, 2016; Byrne, 2013; Little, 2013). This was followed by the transformation of these into *z*-scores in SPSS and then establishing the interaction effect between BI and COVID-19 fear (Dugard et al., 2022). Results show that the interaction effect of COVID-19 fear on the relationship between BI and USEB was statistically insignificant ($p > .001$). Table 5 presents the regression analysis done in SPSS and in AMOS (see Figure 3). Given the insignificant *p* value, the results show no moderating effect of COVID-19 fear on the relationship between BI and USEB. H11, hypothesizing the moderation effect of COVID-19 fear on the association between BI and USEB, is thus not supported and rejected (Table 5).

TABLE 5 Model summary and regression analysis of COVID-19 fear impact on BI-USEB relationship.

Model	R	R^2	Adjusted R^2	SE of the estimate
1	.754[a]	.569	.567	.65823310
2	.755[b]	.570	.567	.65789521

[a]Predictors: (Constant), *Zscore (Fear), Zscore (BI)*.

[b]Predictors: (Constant), *Zscore (Fear), Zscore (BI),* interaction.

Model		Unstandardized coefficients		Standardized coefficients		
		B	*SE*	*Beta*	*t*	*Sig.*
1	(Constant)	−4.670E−16	.032		.000	1.000
	Zscore (BI)	.759	.033	.759	22.796	.000
	Zscore (Fear)	−.020	.033	−.020	−.600	.549
2	(Constant)	.008	.033		.253	.800
	Zscore (BI)	.754	.034	.754	22.442	**.000**
	Zscore (Fear)	−.027	.034	−.027	−.792	**.429**
	Interaction	−.033	.027	−.040	−1.195	**.233**
	Regression weights: AMOS	**Estimate**	**SE**	**C.R.**	*p*	
H11: Rejected	ZUSEB<---ZBI	.754	.033	22.523		
	ZUSEB<---Interaction	−.033	.027	−1.199	.231	
	ZUSEB<---ZFEAR	−.027	.034	−.794	.427	

Note: The model summary and regression analysis of COVID-19 fear impact on BI-USEB relationship in SPSS. The bold values show the insignificant effect of COVID-19 fear variable on the relationship between BI and USEB.
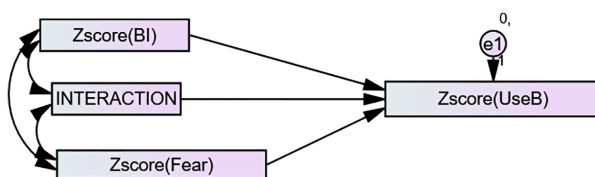
FIGURE 3 Moderating effects of fear. Interaction of behavioural intention, COVID-19 fear and use behaviour variables.

4.2 | Discussion of the results

R^2, the explained variance is 69% which reflects the substantial predictive power of the extended UTAUT2 model (Henseler et al., 2009). This implies that the extended model explains 69% of the variance in tertiary students' BI to resume face-to-face mode of study, post-COVID-19. Notably, R^2 of the UTAUT2 constructs only was 66% while R^2 of the three additional variables (trust, commitment and comfortability) was 61%. The integrated nine constructs enhanced the model and confirms that the three added variables can impact the tertiary students' BI to resume face-to-face mode of study, and BI, in turn, influencing their USEB (Robert & John, 1982). The combined application of the nine constructs improved the extended UTAUT2 model's predictive power, confirming that this model can explain the endogenous variables.

Overall, five of 10 hypotheses are confirmed as the results show that SI, HM, FC and COMT have positive significant impacts on BI.

The findings of this empirical study report significant positive impact of SI on BI (H3), where SI is the degree to which important individuals influence a person's BI towards any activity. This finding agrees with prior studies by Fidani and Idrizi (2012); Gruzd et al. (2012); Gupta et al. (2008); Im et al. (2011); Raza et al. (2021, 2022); Venkatesh et al. (2003) and Widjaja et al. (2020) who reported a likewise positive relationship between SI and students' BI in education. In this study, students reported that their friends and family are important influencers and prefer face-to-face courses. Students also pursue this mode because their friends and family are doing so too. The Pacific island cultures are collectivist in nature where extended families as well as friends support one another and even assist with further education financially as well as through accommodation.

The empirical results of this study further report FC having significant positive impact on BI (H4). Facilitating conditions generally include the availability of adequate organizational infrastructure and resources to support the use of technology. This finding concurs with earlier studies of Bakar et al. (2013), Lu et al. (2020) and Raza et al. (2022) who reported that FC does impact BI. This study, however, disagrees with the findings of Dwivedi et al. (2011), Lai Wah and Hashim (2021), Raza et al. (2021), Shao and Lee (2020) and Venkatesh et al. (2003) who found FC insignificant. Tarc (2020) also noted that students who prefer face-to-face learning desire social skills and are more engaged with their peers and teachers. In this study, students expressed that face-to-face courses were quite well equipped including study materials with access to group interactions with peers and instructors who conducted courses with ease for better face-to-face learning. Most students depend on university facilities since they do not own laptops or computers and experience poor internet connectivity in the smaller Pacific islands. In the post-COVID-19 context, when resuming face-to-face mode of study, students' prior experience with such technologies during the pandemic does influence their BI, in this part of the world.

The empirical results of this study also found HM reporting significant positive impact on BI (H5). In general, HM involves pleasure, enjoyment, happiness and overall positive attitude given experiences. This study's finding while disagreeing with the results of Raza et al. (2022) concurs with Zwain (2019) and Hoi (2020) who state that HM does impact BI. In this study, students reported that face-to-face mode of study is a good idea, is more interesting and more fun which makes them like face-to-face courses, more. As mentioned earlier, the Pacific cultures are collectivist in nature and more sociable with much of their daily activities being done in groups. At the university, face-to-face mode of study encourages group work, making it interesting and fun to learn together while socializing at the same time. This is unlike independent learning during COVID situation of lockdowns which can be very boring and not at all fun for students who are used to socializing.

Above all, the empirical results evidence COMT (one of the three added variables) as the most influential construct, reporting strongest impact on BI (H8). Commitment involves emotions of loyalty, belonging, affiliation and the desire to remain in a relationship because of the delight of being in it. The present study's result concurs with Guoyan et al. (2021) and Sánchez-Franco and Martín-Velicia (2011) who state that positive emotions of individuals arise because of the delight of being part of such systems. In this study, despite COVID-19, students reported more commitment towards face-to-face courses, expressing happiness in continuing with such courses for the rest of their lives. They even expressed guilt if not committed to face-to-face studies and felt more engaged with such courses. The COVID-19 situation could have brought about a self-realization that adverse events may happen in life which can be beyond control, leading to a certain level of seriousness in students and their influencers who support their education.

BI, in turn, reported a significant positive impact on USEB (H10), a finding that is consistent across extant literature. This study, thus, agrees with Ali et al. (2018), Azizi et al. (2020), Motaghian et al. (2013), Raza et al. (2021, 2022) and Wang and Wang (2009) who found a strong relationship between BI and USEB in technology-supported learning. This study's finding proves similar for face-to-face mode of study which itself does involve some level of technology, though not as extensive as the full online modes. This can be attributed to students' perceptions of lower risk given their age, they being vaccinated and the safety precautions practised by the university, increasing their BI and USEB when resuming face-to-face mode of study, post-COVID-19.

In contrast, the present study did not report any significant relationship between PE, EE, PV, TR, COMF and BI (H1, H2, H6, H7, and H9). The findings on PE, EE and PV are consistent with some studies such as those of Zwain (2019) who did not report any positive impact of PE and EE, Chinyamurindi et al. (2017) found that EE had no effect and El-Masri and Tarhini (2017) found PV insignificant. However, the findings of the present study on PE, EE, PV, TR and COMF do not support the findings of various prior studies such as Abbas (2018), Ali et al. (2018), Althunibat (2015), Decman (2015), Hoi (2020), Mehta et al. (2019), Raza et al. (2021, 2022), Tarhini et al. (2014) and Zacharis and Nikolopoulou (2022) who reported a favourable association between PE and BI. The present study also disagrees with Ali et al. (2018), Althunibat (2015), Azizi et al. (2020), Jakkaew and Hemrungrote (2017), Raza et al. (2021, 2022) and Tarhini et al. (2014) who reported a positive relationship between EE and BI. Nonetheless, Ali et al. (2018) did highlight the inconsistency in various contexts regarding the relationship between EE, PE and BI arguing that results may differ given different study contexts, techniques used and sample size. In addition, the present study's results do not concur with the studies by Alalwan et al. (2017) and Moorthy et al. (2019) who found a significant relationship between PV and BI. This study also disagrees with Hanif et al. (2022) who stated that trust is likely to increase BI. The finding of this study further does not agree with Arain et al. (2019) who purported that if users are comfortable using technology, they are likely to continue using it in the future. The reason why the present study does not concur with abovementioned studies on PE, EE, PV, TR and COMF may be because USP being a regional university had experience in distance mode learning since 1970 and online learning since 2000. It continuously allowed students to pursue courses in various modes including print mode, face-to-face mode, blended mode as well as online modes. This gave students some prior experience with some level of technology, being utilized in all modes. A higher percentage of respondents in this study was final year students who have this prior experience. Most importantly, the level of technology required in face-to-face is not to the extent required in full online modes. Face-to-face learning is largely more beneficial for students who have inadequate home-learning conditions (Iqbal et al., 2022) which is common in less developed or developing Pacific island economies.

In addition, the moderating analysis shows that the moderator of COVID-19 fear has no interaction effect on the relationship between BI and USEB, reporting insignificant results (H11), thus confirming that COVID fear does not moderate the relationship between BI and USEB, rejecting H11. This means that the presence of COVID fear amongst the USP tertiary students does not affect the relationship between BI and USEB. COVID-19 fear generally relates to getting infected, and quicker transmission that affects survival rates. In this study, this fear was about being afraid of the outbreak when resuming face-to-face studies and being worried about the impact it would have on education. USP continued to uphold COVID-19 protocols and safety measures when resuming face-to-face mode of study. Students were encouraged to get vaccinated and only those who were vaccinated were allowed on campuses which reassured the students. In a way, the study's finding agrees with prior studies like Cantero-Garlito et al. (2021) and Martínez-Lorca et al. (2020) who found that when returning to face-to-face learning settings, students did not express fear of contracting COVID-19 and the second- and third-year students experienced less fear when compared to the general population.

5 | CONCLUSION, IMPLICATIONS, LIMITATIONS AND FUTURE RECOMMENDATIONS

5.1 | Conclusion

The aim of this research was to examine the tertiary students' behavioural intention to resume face-to-face mode of study, post-COVID-19 using an extended UTAUT2 model. This model incorporated three additional variables of trust, commitment and comfortability and COVID-19 fear as the moderator variable. The experience students had during COVID-19 could have affected their trust, commitment and comfortability levels when resuming

face-to-face mode of study after the pandemic. The modified model was then tested in the context of South Pacific developing country's tertiary students to better understand their BI and USEB when resuming face-to-face mode of study, post-COVID-19. The application of this model makes it a relevant extended model when applied to higher education setting, post-COVID.

Using a quantitative method as well as a convenience sampling technique, this research collected information from 419 tertiary students. From the empirical results, it can be concluded that social influence, hedonic motivation, facilitating conditions as well as student's commitment towards a university's face-to-face delivery mode may matter when it comes to students' BI and their USEB when resuming face-to-face tertiary courses, post-COVID-19. Thus, the need to consider factors that are relevant to this student's target market who may differ from those who reside in other better developed countries. The university under study is a regional university with students of different backgrounds from 12 different Pacific Island member countries.

5.2 | Theoretical and practical implications

5.2.1 | Theoretical implications

This study makes various theoretical implications. First, it is amongst the first few empirical studies that examined, both tertiary students' BI as well as their USEB when resuming face-to-face mode of study, post-COVID-19. Most studies have only focused on student behavioural intentions to continue with online learning or blended learning (e.g., Ali et al., 2018; Curelaru et al., 2022; Iqbal et al., 2022; Naik et al., 2021) including during the COVID situation (Raza et al., 2021, 2022). In comparison, only very few researchers (e.g., Cantero-Garlito et al., 2021; Martínez-Lorca et al., 2020) focused on students' intention to go back to face-to-face learning, post-COVID-19.

Second, the study tested the UTAUT2 model that was extended incorporating three additional variables of trust, commitment and comfortability (the three rarely tested in educational setting with UTAUT2), one of which—commitment reported the strongest impact on BI. There are studies on tertiary students, the UTAUT2 model as well as pre- and during COVID-19 studies with other additional variables (Raza et al., 2022). The three variables in this study strengthened the initial UTAUT2 model, making it a suitable model in the current post-COVID-19 situation. In addition, our research is also novel with the moderating factor of COVID-19 fear, this being used within the UTAUT2 theory for the first time as a moderator between BI and USEB. Literature is indicative of this factor hindering the resumption of face-to-face mode of study or students being indifferent to it or students voluntarily or forcefully returning to normalcy despite the COVID-19 fear. However, such claims are mere inferences and have not been well validated in literature. Largely, most studies have no moderator at all, apart from a few demographic factors. Studies like those by Raza et al. (2021) did utilize UTAUT but excluded hedonic motivation and added social isolation as an additional variable with corona fear moderating the association of independent variables and BI. Raza et al. (2021) did call for more studies on coronavirus's influence and studies on other developed as well as developing countries. Scholars such as Tarhini et al. (2014) further encouraged the modification and validation of the survey instrument with new measures, especially when extending an established theory. In this way, we not only developed a survey questionnaire for tertiary students' behavioural intention towards face-to-face mode of study, post-COVID-19 but also validated it with empirical testing.

Prior to our study, this theory never incorporated the three variables, thus never studied these collectively in a single academic research in the context of developing country's tertiary students', adding a unique perspective to UTAUT2 theory. As mentioned earlier, several research (e.g., El-Masri & Tarhini, 2017; Eneizan et al., 2019; Gupta et al., 2018; Raza et al., 2020; Raza & Khan, 2022; Singh & Matsui, 2017) either used trust as a variable in the UTAUT2 model or studied it as a mediator of BI in differing contexts of internet/mobile banking, online shopping, tourist adoption of smartphone apps, blended learning, student performance and cloud computing and student behaviour and mobile learning during COVID-19. There are also few deliberations on commitment by Guoyan

et al. (2021) and Raza et al. (2021) and on comfortability being discussed in education settings (e.g., Muangmee et al., 2021; Raza et al., 2020) or in other contexts (Aranyossy, 2022). However, in this study, the three have been used collectively in one study to extend the UTAUT2 model. This study also explored these within a novel context of students' intentions to resume the traditional mode of learning, post-COVID-19, not during COVID and in a smaller developing Pacific island country context.

By extending the UTAUT2 theory, the authors of this present study take forward its conceptualization making it clearer for better understanding of tertiary students' BI and USEB when resuming the face-to-face mode of study, post-COVID-19. In doing so, this study contributes to the theoretical advancement of tertiary education, post-COVID-19 research area, enhancing current literature. Also, with empirical testing, the authors of this study further confirmed the legitimacy and strong theoretical grounding of the extended UTAUT2 theory. The extended theory enhanced its predictor power, evidenced by the higher R^2 score, good reliability and validity scores and appropriate model fit, paving the way for even further improved models for similar studies. Testing the generalizability of such extended models with their associated instruments is important in theory building to better understand the context studied and helps to know how such contexts impact the views of such theories (Venkatesh et al., 2012).

Third, the study provides empirical evidence from a regional education institution's perspective. This study adds variety to literature as much of the prior research is premised on developed countries like USA, Europe and China universities that are not regional universities.

Fourth, the findings report strongest influence of commitment and no significant influence of PE, EE, PV, TR and COMF on BI, unlike some previous studies and no significant influence of COVID-19 fear on the association between BI and USEB, suggesting that some factors that influence BI may impact tertiary students differently in different countries. In this way, some research findings of this study depart from prior studies, indicating that factors of the model affect tertiary students differently. Our study also shifted the focus to a university that is unique in itself being a regional university. It is a university that is understudied and has students who have different backgrounds and are affected in different ways, post-COVID-19; but still very important to understand. This study hence sets a foundation for future research in such universities or universities of developing countries.

5.2.2 | Practical implications

The empirical study reports that students and their decisions are influenced by friends, family members, the university, the various study resources, instructors' interactive teaching, and student's own motivation and commitment when resuming face-to-face mode courses. Thus, education institutions resuming face-to-face mode courses post-COVID-19 need to consider various factors mentioned below. The following suggestions can strengthen the relationship between a developing country's tertiary education institution and their face-to-face students.

First, the results show that friends, family members and the university (SI) are important to the students as they are influenced by their opinions, support and they taking up courses in the same mode. The result showed weak but significant positive impact of this factor. As such, universities must consider such influence and include students' families during orientation and open day events. In promotional activities, universities can also feature family and friends' support in taking up face-to-face mode courses.

Second, the empirical findings also point out that students are positively affected by courses that are well equipped with all necessary resources including hardware, software, network, readily available study materials and interactive sessions with both the instructor as well as their peers (FC). The study indicates that students do like face-to-face mode of study and find it a good idea, more interesting and fun than other modes (HM). Despite their association not being that strong in this study, FC and HM were significantly positive. Thus, universities should make stronger efforts to upgrade their computer laboratories, tutorial and lecture halls, equip these with enough computers and projectors that work properly, improve internet connectivity and speed, make study materials more readily available and include more teaching and learning sessions and assessments that allow teamwork as well as encourage

comfortable interactions with the instructors such as in group projects, study teams, presentations, etc. The policy-makers and funding institutions should take heed of the importance of facilitating conditions and make necessary budget allocations.

Lastly, the study reports commitment as having the strongest significant impact. Results show that students' commitment towards face-to-face mode courses has not waned despite COVID-19. Students, in fact, feel more committed and engaged towards such courses. At this university, its various campuses and centres have and should continue to promote COVID-19 vaccination and practice of safety protocols such as use of sanitizers, wearing of masks and social distancing. These encouraged both staff and students towards resuming face-to-face mode of study. Fewer cases of COVID-19 and quick appropriate actions by the university and its various campuses in terms of lockdowns and reopening when it was safe, gave both the students and staff the confidence to return to normalcy.

Finally, in terms of methodology, like the study by Ali et al. (2018), this study used SEM for quantitative analysis which is lacking in smaller South Pacific country universities in education research, encouraging rigorous statistical analysis in education research (Ali et al., 2018).

5.3 | Limitations and future recommendations

This study, like other studies, has some limitations. However, these suggest meaningful directions for future research. First, this study may not offer a complete post-COVID-19 face-to-face mode of tertiary education situation. The sample is skewed towards the 21- to 30-year olds, females, 300-level students of the Business and Economics faculty and urban dwellers of a regional university that is rarely studied for this subject matter. Notwithstanding, it does encourage scholars to investigate this subject matter in the post-COVID-19 higher education situation, making comparisons with this university or between other universities, using the same extended model to further validate its findings. Findings indicate some constructs of the extended model like PE, EE, PV, TR and COMF reporting insignificant results—this needs more research and validation. Second, convenience sampling was used which can impact the generalizability of results (Ellis & Levy, 2009). Scholars can, thus, use other forms of data-gathering methods, adopting longitudinal or even experimental designs. Third, since this research used quantitative method only, future researchers may use mixed methods including qualitative methods. Even so, 49% of Harman's single factor test proves that findings of this study are not affected by the common method bias, thus findings are meaningful for further studies. Additionally, R^2 was 69%, reflecting high predictive power compared to the lower 66% of UTAUT2 theory alone and 61% of the three additional variables. Future work can also add and/or combine variables of other relevant theories like S-O-R to further enhance the theoretical explanatory power. In addition, future work can add the habit variable as an independent variable since this was not used or tested in this study. This variable may impact the students' behavioural intention to resume face-to-face mode of study, post-COVID and is thus recommended.

Furthermore, scholars can conduct comparative studies, examining the effects on different demographic segments between various developing as well as developed countries' universities. Studies can also conduct multigroup studies to investigate the effects of factors like age, race, gender, qualification level, faculty, religion, course levels, country of origin and cultural dimensions which were beyond the scope of the present study.

Despite the above limitations, the present study contributes theoretically as well as practically towards the resumption of face-to-face mode of study, post-COVID-19 in higher education institutions with its findings benefitting the educators, university decision makers, policymakers as well as the academics.

AUTHOR CONTRIBUTIONS

Jashwini Narayan: Data curation; formal analysis; project administration; software; supervision; validation; visualization; writing – original draft; writing – review and editing. **Samantha Naidu**: Questionnaire development,

distribution & collection; data entry, conceptual framework and literature review, writing – review and editing, journal styling and correspondence.

CONFLICT OF INTEREST STATEMENT

None.

DATA AVAILABILITY STATEMENT

Data is available upon request.

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