

The Impact of Technostress on Student Satisfaction and Performance Expectancy

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Abstract: Technostress can be seen as a relevant factor that may affect student satisfaction and student performance. However, a lack of research has been carried out to analyse the simultaneous effect of the four technostress dimensions, namely techno-overload, techno-complexity, techno-insecurity, and techno-uncertainty on student satisfaction and performance expectancy. Performance expectancy is appropriate to use as an endogenous construct since this research was carried out during open and distance learning (ODL) implementation and before the final examination. Hence, this study aims to investigate the association between the four technostress dimensions towards student satisfaction. This research also seeks to examine the relationship between student satisfaction and performance expectancy among undergraduates. A total of 500 self-administered questionnaires were distributed but 458 valid questionnaires were found. All of the respondents were at the diploma level from UiTM Pahang Branch Campus. An online survey questionnaire was used since all respondents were in their hometowns due to the Malaysian government's Movement Control Order (MCO). In this study, SEM-AMOS was conducted to evaluate the measurement model and to test the hypotheses. This study found that techno-complexity displays a more significant contribution to student satisfaction and performance expectancy than techno-uncertainty. However, the results explicitly imply that the influence of techno-overload and techno-insecurity on students' satisfaction and performance expectancy is not significant.

Keywords: Performance expectancy; student satisfaction; technostress; university students

1. Introduction

Technostress refers to any adverse effect on human psychology, attitudes, thoughts, and behaviours resulting from technology (Tu, Wang, & Shu, 2005). With the wide use of IT in online teaching and learning in Malaysia, technostress has become an area of concern by many researchers

interested in seeing the potential effects of technostress on instructors and teachers (Christian, Purwanto, & Wibowo, 2020; Çoklar, Efiltili, Şahin, & Akçay, 2016; Hung, Chen, & Lin, 2015; Jensen, 2015; Joo, Lim, & Kim, 2016; Lee, Chang, Lin, & Cheng, 2014; Quinn, 2001; Syvänen & Mäkinen, 2016). The implementation of open and distance learning (ODL) has become an urgent need as the whole world, including Malaysia, struggles with the Covid-19 pandemic. Most schools and local universities in Malaysia have no choice but to use virtual teaching and learning methods to ensure that the teaching syllabus can be delivered as good as possible, and learning sessions are not delayed.

A study done by Christian et al. (2020) shows that the implementation of online learning during the outbreak of Covid-19 pandemic causes teachers to experience technostress which eventually affects their teaching performance. Christian and colleagues anticipate that the ongoing Covid-19 pandemic and its overall effects may have an interesting explanation of technostress for students. Therefore, this study aims to answer the call of Christian et al. (2020) to see if there are any difference findings gain from this current study.

In this case, technostress can be seen as a relevant factor that may affect student satisfaction and student performance. However, to date, there are still very few studies conducted to examine the simultaneous effects of technostress dimensions on student satisfaction and performance expectancy. Since this study was conducted during the implementation of open and distance learning (ODL) and before the final examination, then the performance expectancy is a suitable variable to be used as an endogenous construct compared to the real academic performance. Hence, the aim of this study is to examine the relationship between technostress dimensions (techno-overload, techno-complexity, techno-insecurity and techno-uncertainty) and student satisfaction and performance expectancy among university students.

2. Literature Review

2.1 Person-Environment Fit Theory

Person and environment (P-E) fit refers to a good fit between people's characteristics and the environment (Edwards, Caplan, & Harrison, 1998). In principle, P-E fit occurs when the need, skills, and ability of the person are compatible with environmental factors organisation, tasks, and people, resulting in life satisfaction and well-being. On the other hand, a P-E Misfit occurs when one's personal factors do not match the environmental factors, causing stress and affecting individual performance and well-being. Based on the P-E fit theory, stress does not solely arise from personal factors or environmental factors but due to the incompatibility of both (Wang et al., 2020).

Some researchers (Edwards & Shipp, 2007), put the assumption that the relationship between P-E fit and outcome variables is positive, in which case an increase in P-E fit leads to a positive outcome. Thus, in applying this theory to the context of higher education, we can assume that the increase in students' P-E fit, the better the results related to their academics. In the current study, the researchers predicted that the misfit between students' ability (i.e., their skills using information communication technology) and the new learning environment (i.e., using ODL) has caused technostress and eventually affected student satisfaction and performance expectancy. As P-E fit theory focuses on how a person is matched with the environment, technostress arises when the mismatch between these two factors happens. Stress emerged when the environment does not fulfil the needs of a student or the student's ability is insufficient to meet the demand of the online and distance learning environment.

2.2 Techno-overload

Grandhi, Jones, and Hiltz (2005) define technology overload as a phenomenon of multiple usages of gadgets with multiple functions that causes cognitive and physical burdens on human beings to accomplish multiple tasks in daily activities. The use of smartphones, computers and other gadgets with varieties of applications is essential in open and distance learning as they will aid the teaching and learning process. The pressure to keep up with technology and applications has raised concerns on how techno-overload affects student satisfaction and performance. Rashid and Muhammad Asghar (2016) find a positive effect of technology usage on self-directed learning and student engagement. The results portrayed that technology has induced students self-learning, which eventually affects their academic performance positively.

Similar results were also found by Ahmad et al. (2012). They find a positive relationship between techno-overload and organisational commitment, which indicates that some employees view heavy workloads and tight deadlines as positive challenges that improve their job quality and job satisfaction. The result contradicts Hsiao, Shu and Huang, (2017), where they find that compulsive technology usage significantly impacted technostress and had no significant effect on academic performance. A study done by Qi (2019) finds that university students are free from technostress of mobile devices; thus, it may enhance their academic performance. However, technostress was significantly affected when students' individual differences (e.g., technology self-efficacy and extend of usage) were taken into account. Based on the literature, this paper proposes the following hypotheses:

- H1: There is a significant relationship between techno-overload and student satisfaction.
- H2: There is a significant relationship between techno-overload and student performance expectancy.

2.3 Techno-complexity

To make full use of technology and applications in open and distance learning, students have to be literate of the system and skilful in using them. Difficulty to cope with the technology and applications will affect the effectiveness and eventually will lead to frustrations or affect satisfaction and performance. The process of dealing with problems and requirement to upgrade the skills of specific technology or applications is referred to as techno-complexity (Tarafdar, Tu, Ragu-Nathan & Ragu-Nathan, 2007). Meanwhile, Upadhyaya and Vrinda (2020) refer to tech-complexity as a condition where technology makes students feel insecure that their skill sets are insufficient. According to Ahmad and Amin (2012), techno-complexity will cause students to utilise excessive time and effort to study and understand the various features of technology and applications. It was also found that female students experienced higher levels of techno-complexity as compared to their counterparts (Ahmad & Amin, 2012). A study conducted by Upadhyaya and Vrinda (2020) find that older postgraduate students, female students and students with lesser ICT experience perceive technology as complex. Furthermore, the study also reports that a younger group of students also experiences technostress induced by techno-complexity. Based on the literature, this paper proposes the following hypotheses:

- H3: There is a significant relationship between techno-complexity and student satisfaction.
- H4: There is a significant relationship between techno-complexity and student performance expectancy.

2.4 Techno-insecurity

Tarafdar, Tu, Ragu-Nathan and Ragu-Nathan (2007) describe techno-insecurity as any factors related to fear due to the level of technological knowledge and knowledge sharing between colleagues. At the same time, Ahmad and Amin (2012) refer to techno-insecurity as a condition where ICT users feel intimidated that new ICT or other people who are better in ICT will replace them or their job. From an academic perspective, Upadhyaya and Vrinda (2020) define techno-insecurity as a situation where the students feel threatened and pressured by the prospect of getting poor academic performance due to technology illiteracy as compared to other students. According to Komala and Meena (2017), techno-insecurity will cause students to experience anxiety, leading to tension, headaches, sweaty palms, heart palpitations and a queasy stomach. The symptoms will arise when they are dealing with interactions with computers or using computer technology. Therefore, this paper proposes the following hypotheses:

- H5: There is a significant relationship between techno-insecurity and student satisfaction.
- H6: There is a significant relationship between techno-insecurity and student performance expectancy

2.5 Techno-uncertainty

Tarafdar, Tu, Ragu-Nathan and Ragu-Nathan (2007) describe techno-uncertainty as a condition where people have to deal with constant technological changes within an organisation. According to Ahmad and Amin (2012), technology and ICT applications are endlessly shifting and in need of upgrading. Due to this characteristic, some ICT users feel hesitant and disturbed, which lead to techno-uncertainty. Owusu Adjah and Agbemafle (2016) claim that even though technology advancement has allowed many tasks to be carried out faster and more efficiently, many employees are not comfortable. They feel intimidated with its implementation that involves change and uncertainty – a reflection of techno-uncertainty that may influence workers. Those who are more confident in handling computers and have more faith in their ability to control the disruptions arising from techno-stress-creating conditions will experience less technostress (Owusu Adjah & Agbemafle, 2016).

Similarly, from an academic perspective, Upadhyaya and Vrinda (2020) refer techno-uncertainty to a situation where frequent changes and upgrades in technology, create uncertainty for students. However, Upadhyaya and Vrinda (2020) conclude in their study that among the five technostress dimensions, techno-uncertainty was found to be the least contributing factor to technostress. Therefore, in this paper, these hypotheses are proposed:

- H7: There is a significant relationship between techno-uncertainty and student satisfaction.
- H8: There is a significant relationship between techno-uncertainty and student performance expectancy.

3. Methodology

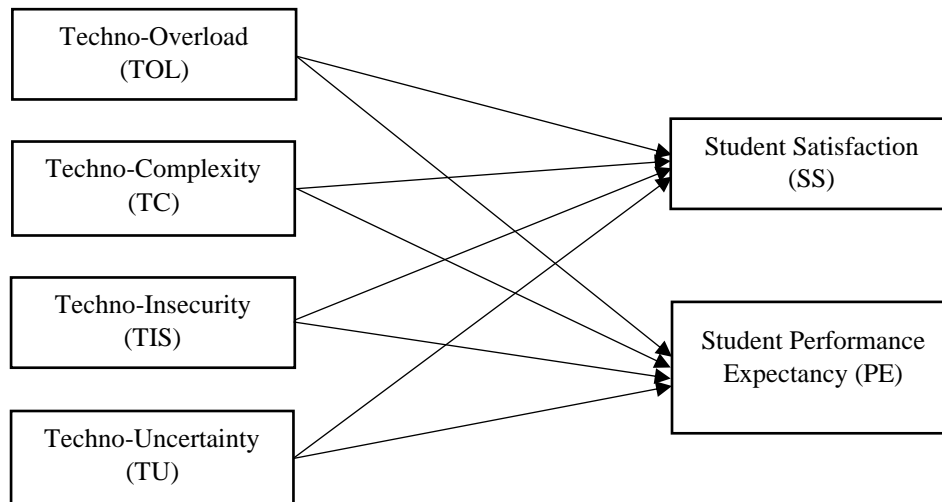


Fig. 1 Theoretical Framework

Fig. 1 describes the conceptual framework proposed in the current study to explain the link between techno-overload, techno-complexity, techno-insecurity, techno-uncertainty, student satisfaction and performance expectancy. The present study lays out a conceptual framework intended to analyse factors that may influence student satisfaction towards online learning and performance expectancy. The conceptual framework illustrates the essential constructs included in this study will guide further discussions. The current research proposes that techno-overload, techno-complexity, techno-insecurity, and techno-uncertainty will significantly affect student satisfaction towards online learning and performance expectancy.

3.1 Instrumentation

We used the questionnaire developed by previous researchers (Aziz & Yazid, 2021; Li & Wang, 2020). The questionnaire contains 39-items centred around six topics: techno-overload, techno-complexity, techno-insecurity, techno-uncertainty, student satisfaction, and performance expectancy. Participants were asked to rate their agreement with each statement on a ten-point Likert's scales ranging from 1 for "strongly disagree", and 10 for "strongly agree." The students were informed that participation was voluntary, and that all data would be treated confidentially. The data were collected during lecture weeks and before the final examination.

The first section is related to techno-complexity. In this section, participants were asked to describe the extent to which they are driven to work faster and longer due to increased study demands because of the use of ODL. The questions include such items as "I have to do more work than I can handle due to the implementation of ODL", "I have to work with very tight time schedules due to the implementation of ODL" and "I have to change my study habit to adapt to ODL".

The second section is related to techno-complexity. Participants were asked to indicate their assessment about to what extent the complexity of ODL increases their work difficulty and forces them to continually learn and relearn skills to cope with challenges associated with increasingly complex or fast-changing technologies. Among the questions are "I often find ODL too complicated for me to understand it well", "I often find ODL too complicated for me to use it effectively", and "the high complexity of ODL causes me to doubt its usefulness and practicality in education".

The third section is related to techno-insecurity. In this section, participants were asked to assess the extent to which they feel insecure about their study for fear of being defeated by other people who have higher capabilities in using ODL. Examples of questions are as follows: "I feel threatened by peers with better ODL skills", "I feel threatened by peers who know more about ODL than I do", and "I feel threatened by peers who easily adapt to ODL environment than I do".

The fourth section is related to techno-uncertainty. In this section, participants were asked to indicate their view on how they feel uneasy about integrating ODL in their learning process. The samples of questions are "there are frequent upgrades in the ODL we use in our university" and "there are constant changes to the functionalities in the ODL we use in our university".

Next section is related to student satisfaction. This section asks students to describe their level of satisfaction with ODL in teaching and learning for the current semester. For instance, "I enjoy studying using ODL", "ODL is exciting", and "overall, I am satisfied with ODL".

The last section is related to performance expectancy. In this section, participants were asked to indicate their assessment of the degree to which the ODL will benefit them in academic performance. The samples of questions are "I find ODL can improve my learning performance", "I find ODL enables me to accomplish more work than I possibly could", and "I find the ODL increases the chances of getting good grades."

Additional demographic and sociodemographic background questions provide information on participants' gender, age, education level, name of faculty, and residence area while attending open and distance learning. Other questions are related to the ODL method used by their lecturer and the problems encountered during ODL, in which participants could give multiple answers.

3.2 Sampling Procedure

The generally accepted rule of practice is 10 cases / observations of each indicator variable in setting the lower limit of adequate sample size (Nunnally, 1978). In this study, a sample of UiTM students was used, of which UiTM is the largest public university in Malaysia and the population is over 1,200. Therefore, 427 samples is sufficient for generalizability. Thus, 500 online questionnaires (using Google Forms) were distributed to Universiti Teknologi MARA (UiTM) students using simple random sampling to assess the developed model and test the hypotheses. The questionnaires were distributed at the end of the semester and before the students sat for the final examination. The data were collected throughout five weeks period (i.e., July to August 2020).

3.3 Data Collection and Sample

Out of the 500 online questionnaires, 458 students responded giving an overall response rate of 91.6 per cent. Participants' ages ranged from 18 to 21. Most of the respondents are female. All the students are at diploma level from UiTM Pahang Branch Campus. However, during the implementation of ODL, they are all in their hometowns due to the Malaysian government's Movement Control Order (MCO). Based on our survey, fifty-seven per cent of students pursue ODL from suburban areas, twenty-three per cent of students pursue ODL studies from urban areas and twenty per cent of students from rural areas. The three most widely used ODL teaching methods are Learning Management System (e.g., Google classroom, U-Future, Microsoft team), video conference applications (e.g., hangout meet, Zoom, Webex, Whatsapp video, Microsoft Team), and social media/web 2.0 (e.g., Facebook, Instagram, Youtube, Twitter, WhatsApp, telegram).

3.4 Data Analysis

Since the measurements utilised were self-reports, our results could be tainted by common method variance (CMV), or same source bias. Response bias, common method bias, and social desirability bias were addressed prior to inferential data analysis, as the presence of bias casts doubt on the generalizability of results (Yüksel, 2017). There are numerous approaches for evaluating CMV, one of which is Harman's single-factor test. This method involves putting all the items from the constructs being measured into an exploratory factor analysis to examine if a single factor emerges or if one factor accounts for the majority of the covariance in the variables. The result indicates that none of the factors explained individually the majority of the variance. In sum, the findings showed no indication of bias and therefore common method variance was not a significant issue in this study.

According to Zainudin (2014), data distributions with Skewness between ± 1.0 may be regarded approximately normally distributed in social science and education research. The data of this study showed normal distribution and outliers were eliminated. The assumptions of normality and no multicollinearity were fulfilled before conducting the structural equation modelling.

4. Results and Discussion

4.1 Confirmatory Factor Analysis

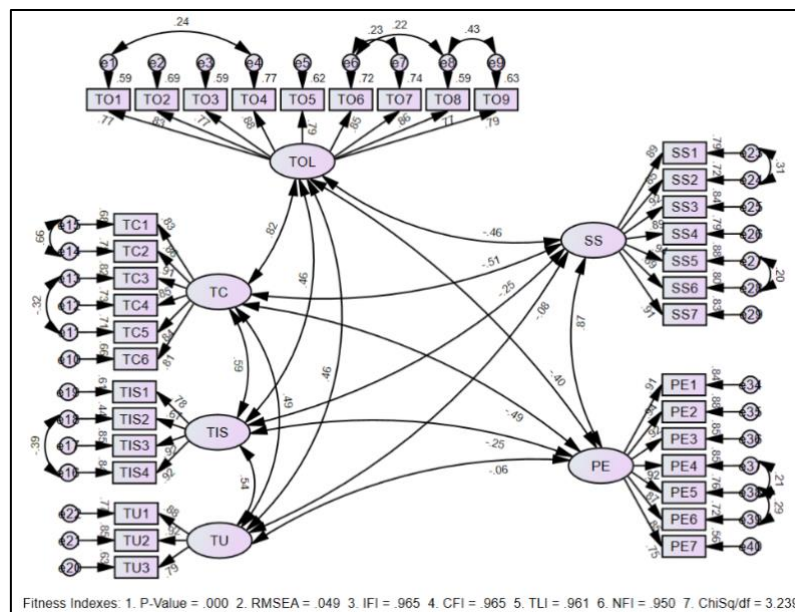


Fig. 2 The CFA Results

Note: N = 458; *** = <0.001 ; *TOL* Techno-Overload, *TC* Techno-Complexity, *TIS* Techno-Insecurity, *TU* Techno-Uncertainty, *SS* Student Satisfaction, *PE* Performance Expectancy

Fig. 2 shows the CFA results with all items retained. The purpose of conducting a Confirmatory Factor Analysis (CFA) is to identify the best models in explaining the data obtained from this study. Zainudin (2014) suggest that the model is satisfactory with the root mean square error of approximation (RMSEA) less than 0.08, the comparative fit index (CFI) is greater than 0.90 and chi-square degree of freedom (Chisq/df) is less than 5.00. The goodness-of-fit indices shows that the data is fit using the same instrument as Li and Wang (2020); which are RMSEA = 0.051; CFI = 0.961; ChiSq/df = 3.394. These fit index values suggest that the model is fit and can be used for further analysis. The CFA results also indicate that all factor loadings are significant and exceeded the cut-off point value of 0.60.

Table 1. Average Variance Extracted (AVE) and Construct Reliability (CR) of Confirmatory Factor Analysis

Construct	Items	Construct Reliability (CR \geq 0.6)	The average variance extracted (AVE \geq 0.5)
Techno-Overload	9	0.946	0.681
Techno-Complexity	6	0.936	0.710
Techno-Insecurity	4	0.887	0.668
Techno-Uncertainty	3	0.889	0.748
Student Satisfaction	7	0.967	0.805
Performance Expectancy	7	0.964	0.794

Table 1 presents that all factor loadings are very significant, supporting opinions on convergent validity (Zainudin, 2014). The results also illustrate the reliability of constructs and the average variance score extracted from the various factors obtained. As indicated in Table 1, Construct Reliability (CR) of all constructs have factor loadings exceeding the threshold value of 0.60, (Zainudin, 2014), ranging from 0.887 to 0.967. AVE for all constructs is greater than the acceptable limit of 0.5, (Zainudin, 2014) ranging from 0.668 to 0.805, further supporting the validity of convergent constructs. These results indicate the internal consistency of the instruments used in this study.

Table 2. Discriminant Validity

	TOL	TC	TIS	TU	SS	PE
TOL	0.825					
TC	0.820	0.843				
TIS	0.460	0.590	0.817			
TU	0.460	0.490	0.540	0.865		
SS	0.460	0.510	0.250	0.080	0.897	
PE	0.400	0.490	0.250	0.060	0.870	0.891

Note: N = 458; *** = <0.001 ; *TOL* Techno-Overload, *TC* Techno-Complexity, *TIS* Techno-Insecurity, *TU* Techno-Uncertainty, *SS* Student Satisfaction, *PE* Performance Expectancy

There two criteria of discriminant validity, which are (1) the square root of AVE of each construct should be greater than the correlation coefficients between other constructs, and (2) each item should have more loadings on its associated construct than on other constructs. Results in Table 2 indicate that the correlation values between the constructs. Since the diagonal values (in bold) are higher than the other values in the rows and columns, it can be concluded that criteria of discriminant validity are achieved in this study.

4.2 Structural Equation Modelling

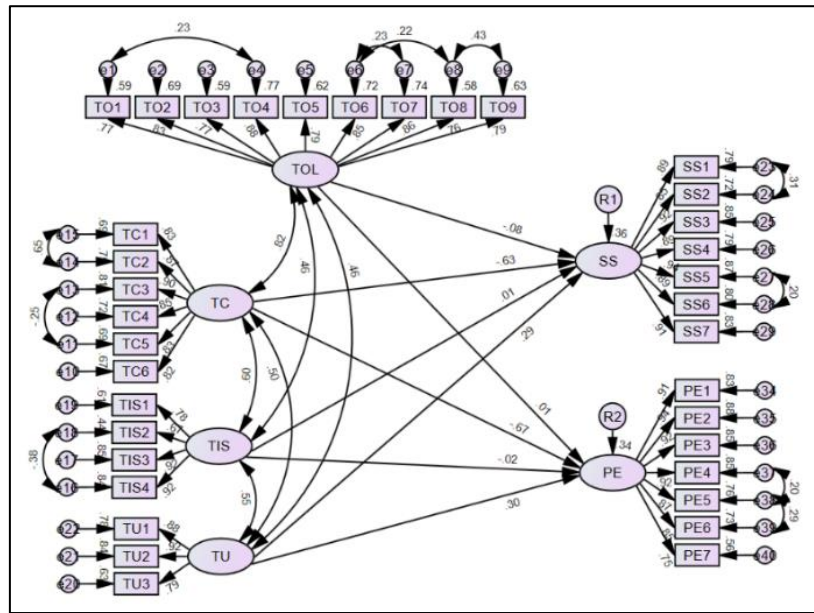


Fig. 3 The Standardized Path Coefficients (Direct Relationship)

Note: N = 458; *** = <0.001; *TOL* Techno-Overload, *TC* Techno-Complexity, *TIS* Techno-Insecurity, *TU* Techno-Uncertainty, *SS* Student Satisfaction, *PE* Performance Expectancy

Table 3. The Standardised Regression Weights and Its Significance

Paths	Estimate	SE.	CR.	P	Results	Hypotheses
H1: TOL → SS	-.112	.082	-1.374	.170	Not Significant	Not Supported
H2: TOL → PE	.012	.082	.147	.883	Not Significant	Not Supported
H3: TC → SS	-.767	.078	-9.879	***	Significant	Supported
H4: TC → PE	-.801	.078	-10.216	***	Significant	Supported
H5: TIS → SS	.006	.035	.163	.870	Not Significant	Not Supported
H6: TIS → PE	-.017	.036	-.484	.628	Not Significant	Not Supported
H7: TU → SS	.381	.050	7.557	***	Significant	Supported
H8: TU → PE	.393	.051	7.729	***	Significant	Supported

Note: N = 458; *** = <0.001; *TOL* Techno-Overload, *TC* Techno-Complexity, *TIS* Techno-Insecurity, *TU* Techno-Uncertainty, *SS* Student Satisfaction, *PE* Performance Expectancy

In this study, SEM-AMOS was conducted to evaluate the measurement model and to test the hypotheses. The regression path coefficients of the direct relationship between constructs are illustrated in Fig. 3 and Table 3 above. Fig. 3 discovers the coefficient value of determination R^2 value of 0.36 for student satisfaction. The figure indicates that technostress contributes a significant relationship to student satisfaction by 36 per cent. The results also present that technostress contributes significantly to performance expectancy by 34 per cent ($R^2 = 0.34$). From Table 3, we clearly find that the influence of techno-complexity is significantly negative for student satisfaction ($\beta = -0.767$, $p < .001$) and performance expectancy ($\beta = -0.801$, $p < .001$). The findings also depict that the influence of techno-uncertainty on students satisfaction ($\beta = 0.381$, $p < .001$) and performance expectancy ($\beta = 0.393$, $p < .001$) are positively significant. Therefore, only four hypotheses are supported (H3, H4, H7 and H8),

and between these two factors, techno-complexity displays a more significant contribution to student satisfaction and performance expectancy compared to techno-uncertainty.

Results from Table 3 explicitly imply that the influence of techno-overload on student satisfaction ($\beta = -0.112, p >.05$) and performance expectancy ($\beta = 0.012, p >.05$) is not significant. Furthermore, the results also prove that techno-insecurity does not significantly influence student satisfaction ($\beta = 0.006, p >.05$) and performance expectancy ($\beta = -0.017, p >.05$). The result contradicts our expectation that techno-overload and techno-insecurity may significantly affect student satisfaction and performance expectancy. Hence, four hypotheses (H1, H2, H5 and H6) are rejected.

5. Discussion

Based on the above analysis, there is a lack of support for *H1: There is a significant relationship between techno-overload and student satisfaction*. It can be concluded that technology overload does not influence the students' satisfaction with ODL. Even though students have to change their study habits to adapt to the new environment of the teaching and learning process, there is no problem for them to learn faster and longer since they are from Z-Generation that is typically exposed to technology and more IT savvy. Besides, most students disagreed that they have to work in a very tight schedule since ODL is relatively flexible compared to face-to-face learning. Usually, most of the lecturers will provide the lecture slide with the voice note attachment before the class begin so that the students can read and understand the content before the class. They will ask anything that they will not understand during the lecture. This method can reduce the students' learning time, and it provides flexibility for them to do their revision anytime and anywhere. Besides, the use of technology in ODL did not affect the students' personal life, and they still have free time to do other activities. Moreover, the use of smartphones, computers, and other gadgets with varieties of ODL platforms used by lecturers are not a big issue for the students since the surface of each ODL platform is quite similar even though they use different gadgets during ODL for teaching and learning process. Besides, the technology self-efficacy of the students is relatively high due to all of the respondents being the young generation. Surprisingly, this finding contradicts a previous study (Upadhyaya & Vrinda, 2020), which finds a significant relationship between techno-overload and academic outcomes.

The findings also reveal that techno-overload is not a significant factor in performance expectancy. Therefore, *H2: There is a significant relationship between techno-overload and performance expectancy* is also not supported. This result shows that technology overload did not influence the performance expectancy of the students. Our finding similar to research conducted by Christian et al. (2020) and Hsiao et al. (2017). This result is different from Li and Wang (2020), finding a positive relationship between techno-overload and work performance. Sumiyana and Sriwidharmanely (2019) also find that high technostress students are more excellent than those who experience low technostress due to their proactive personality that sees workload as an opportunity rather than a threat. As for the current study, we assume that the techno-overload does not affect the performance expectancy because students do not perceive the ODL as burdensome. They are given ample time to do the assignments and tutorial questions. Therefore, they can focus on doing the tutorials and assignments since the lecture hours are commonly reduced and shortened compared to a face-to-face class. Besides, most of the courses at this university have eliminated the final examination during ODL. Hence, students can concentrate on scoring in quizzes, tests, and assignments, leading to better performance expectancy. On top of that, the use of multiple ODL platforms for quizzes and tests do not burdensome to the students since they are familiar with and had experienced using it before.

However, our finding for hypothesis 3 demonstrates a robust negative relationship between techno-complexity and student satisfaction with using ODL. Therefore, *H3: There is a significant relationship between techno-complexity and student satisfaction of ODL* is supported. This finding

indicates that the higher the complexity of technology, the lower the student satisfaction towards the use of ODL. The possible explanation is that students need to learn and understand their lecturers' various technology features in the teaching and learning process. Since ODL is still new in this university, there is no standardisation of ODL platforms or applications. Different lecturers will use various online platforms or applications to deliver the lesson, such as Google Classroom, Google Meet, Cisco Webex Meeting, Telegram, and WhatsApp. As a result, students need to spend time and effort learning how to use various ODL platforms and applications (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2011; Yasin, Ong, & Aziz, 2020a; 2020b), contributing to lower student satisfaction of ODL.

The result of this study also discovers that there is a significant negative relationship between techno-complexity and performance expectancy. Therefore, *H4: There is a significant relationship between techno-complexity and performance expectancy* is also supported. It can be concluded that the higher the techno-complexity, the lower the performance expectancy of the students. This is because most of the students perceived that some of the platforms used for ODL are quite complicated, unstable, not user-friendly, and new for them. Therefore, they do not have enough time to upgrade the skills to use the various platforms used in ODL. One such example could be the institutional online platform known as UFuture. UiTM management has encouraged lecturers to use this platform for teaching and learning, including assignments, quizzes, and tests. However, this platform is still new for some students, and it has some flaws such as instability and incompatibility with some devices. Besides, students' negative attitude towards techno-complexity, such as nervousness and anxiety, might contribute to this result (Seman, Hashim, Roslin, & Ishar, 2019). Most students feel apprehension when they sit for quizzes and tests using the online platform since some of the online platforms are relatively new for them to use. Therefore, it will affect their score for quizzes and tests, which will lead to lower student performance. The result of this study is coherent with the previous studies (Christian et al., 2020; Li & Wang, 2020), which reveal a significant negative relationship between techno-complexity and work performance.

For hypothesis *H5: There is a significant relationship between techno-insecurity and student satisfaction*, it is not supported. This result proves that students would not feel insecure and threatened by their peers who are more apt in using technology and applications in the teaching and learning process. This is because most students admitted that they share their knowledge and ODL skills with their peers. Our survey found that fast learner student and quickly adapt to the ODL environment will share their knowledge, abilities, and skills. This positive attitude will encourage co-operation and team spirit among students, leading to students' satisfaction with ODL. As a result, when opposed to high technology literacy, students with low technology literacy do not feel challenged or stressed, leading to higher student satisfaction. This finding contradicts a previous study by Komala and Meena (2017), who discovered that technological insecurity has a direct impact on student satisfaction.

The findings also expose that techno-insecurity is not a significant factor in the performance expectancy. Therefore, *H6: There is a significant relationship between techno-insecurity and performance expectancy* is also not supported. This result reveals that techno-insecurity did not influence the students' performance expectancy; students do not feel threatened by having an academic performance lesser than other students who have better knowledge, abilities, and skills of using ODL platforms and applications. One of the reasons is that lecturers typically give detailed instructions on using the ODL platforms and applications such as UFuture before they sit for quiz and test. This condition will reduce its techno-insecurity and lead to better performance expectancy. Further, some of the students already have experience using the online platform during blended-learning classes with their lecturers. Hence, it should not be a problem for them to use ODL. Besides, students with low technology literacy will seek help from lecturers and peers to use the ODL platform before they sit for quizzes and tests. Another reason that contributes to this insignificant result is students' performance is typically determined by other factors such as self-attitude towards study, perseverance to excel, and

preparations and readiness to sit for the quizzes, tests, and examinations. This study's finding is consistent with a previous study (Christian et al., 2020), which depicts that techno-insecurity has no significant relationship with work performance.

Hypothesis *H7: There is a significant relationship between techno-uncertainty, and student satisfaction* is also supported. This positive relationship emphasises that although students feel uncertain due to the frequent changing and upgrading of the ODL applications and platforms used in the teaching and learning process, they are still satisfied with the system use. This is probably due to the fact that most of the students are fast learners and adapt well to the new technology since they are from the Z-Generation who are more IT literate. In UiTM, for instance, the UFuture system that has been developed by UiTM to be used as the official ODL platform in this university undergoes continuous changing and upgrading, which sometimes causes system interruptions such as hang and slow in performance, especially when too many users enter the UFuture platform simultaneously. However, students can still accept this system's changes and shortcomings as UFuture is widely used by the entire system at UiTM. Besides, it is widely supported by management and lecturers in helping students to learn more effectively, which in turn contributes to the students' satisfaction of ODL. This finding is congruent with the previous study by Ahmad et al. (2012), who finds a significant and positive relationship between techno-uncertainty and work-related outcomes. They highlight that a certain amount of stress is necessary as it will positively influence employees' well-being and organisations.

Finally, the findings also indicate that techno-uncertainty is a significant factor in performance expectancy. Therefore, *H8: There is a significant relationship between techno-uncertainty and performance expectancy* is also supported. This result discovers that techno-uncertainty has contributed to the performance expectancy of the students during ODL. This is because most of the students agreed that the frequent upgrade and constant changes in ODL method would cause them uncertainty in using ODL platforms and applications in the teaching and learning process which would affect their academic performance. The positive relationship shows that the higher techno-uncertainty, the better these students perceived their performance expectancy. This study's finding is in line with the study of Ahmad et al. (2012), who find that techno-uncertainty may lead to a positive work-related outcome. The possible explanation is although lecturers use various ODL platforms and applications in the teaching and learning process, yet the assistance from their lecturers in clearly explaining how to use the different ODL platform and applications will reduce their uncertainty and improve their performance expectancy. Furthermore, the full support from the lecturers due to the system's incompatibility, such as hang and slow in performance due to the continuing changes and upgrades of the system, also contribute to the higher performance expectancy. Lecturers usually will give another chance by providing a different set of questions to students who have problems with the system used during the quiz or test. Besides, UiTM has also introduced a careline (Samat, Awang, Hussin, & Nawi, 2020) to provide social support to students who have problems in their ODL learning.

6. Implications

Findings obtained from this study can have implications for organisational management in higher education. The high level of techno-complexity experienced by university students indicates that they are reasonably affected by technology in their learning environment using ODL, causing them to experience a certain stress level. Specifically, university students were highly influenced by techno-complexity, and followed by techno-uncertainty, but not affected by techno-overload and techno-insecurity. Therefore, university management and policymakers, especially the Department of Academics Affairs, may consider helping students by providing learning platforms/apps that are more user friendly, accessible, and compatible with their tools such as smartphones and laptops, which will

reduce their stress. Currently, the platform is quite challenging to access. For instance, UFuture is quite complex to understand and difficult to access primarily when many users use it during peak hours.

In addition, the university can offer an ICT guided training related to the use of technology/apps used in teaching and learning (Chung, Subramaniam, & Dass, 2020), especially for new students so that they will be skilful with it, which will eventually lead to higher satisfaction and academic performance. The ICT Department can also provide manuals on the use of systems/applications in the student portal so that they can make references when necessary. Besides, lecturers can also encourage peer sharing among students related to the use of technology in learning. This action can reduce students' feeling of isolation from others.

7. Conclusion

This study investigates the simultaneous effects of technostress dimensions on student satisfaction and performance expectancy. This study concludes that from the eight hypotheses proposed, four hypotheses were accepted, and four hypotheses were rejected. The main finding of this study is that techno-complexity is a critical factor in influencing student satisfaction and performance expectancy. Moreover, techno-uncertainty has a moderately low but significant effect on both variables. Besides, the current study has found that techno-overload and techno-insecurity do not significantly affect student satisfaction and performance expectancy. The insignificant influence between techno-overload and techno-insecurity on student satisfaction and performance expectancy may also be due to other factors such as personality trait. Some researchers suggest that proactive personality may influence the acceptance of technology in learning and, therefore, reduce the adverse effects of technostress (Sumiyana & Sriwidharmanely, 2019). Their argument is based on the transaction of stress theory and personal innovativeness theory. However, they only conducted an experimental study involving 37 postgrad students. Thus, future research may empirically confirm the influence of these personality traits on technostress and its effect on student satisfaction and academic performance expectancy.

This study recognises some limitations. When the data was collected, Malaysia was enforcing the Movement Control Order (MCO) due to the outbreak of the Covid-19 pandemic. Thus, these students had to accept and use the open and distance learning totally for the first time in their university studies. Thus, there may be a possibility that students were still unfamiliar and struggled to adapt to the online learning system. Therefore, future studies could expect results that may differ from this study when conducted on students, who are already proficient in online learning. Moreover, this study only uses the performance expectancy variable because the data was collected before the semester ended. In addition, the survey conducted was confidential, and respondents answered without putting their name. Therefore, it is impossible to conduct a longitudinal approach to see the effect of technostress on students' actual academic performance. Thus, the interview or focus group is expected to help future researchers analyse the samples' responses with regards to their ODL experience so that the future research can explore the issues related in detail.

8. Co-Authors Contribution

The authors affirmed that there is no conflict of interest in this article. Nurul Nadia Abd Aziz wrote the research paper, analyzed and interpreted the data, designed the organization of the study, and was involved in paper submission. Mohd Aidil Riduan Awang Kader wrote the research paper, refined the literature review and discussions of this paper. Roslilee Ab. Halim wrote the research paper and refined the literature review. All authors provided financial expenses equally for this research.

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