

## Acceptance of Technology as a Mechanism In Enlightening the Relationship between Technology Readiness Index and Academician's Loyalty

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### Abstract

This study aims to explore the effects of the Technology Readiness Index (TRI) (optimism, innovativeness, discomfort, and insecurity) on loyalty via the acceptance of technology use. This study was conducted among 206 academicians using Partial Least Squares with Structural Equation Modeling (PLS-SEM) analysis via a purposive sampling technique. The result reveals 1) optimism and innovativeness have significant positive effects on acceptance of technology; 2) insecurity and discomfort have a significant negative effect; and 3) the effects of acceptance of technology towards loyalty also have a significant positive effect, allows this study to conclude that acceptance of technology significantly mediates the relationship.

**Keywords:** loyalty, acceptance of technology, technology readiness

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### 1.0 Introduction

Loyalty is defined as the attitude of continuing to persist in one's support for someone or something (University of Oxford, 2024). It is one of the factors that influence organizational performance and drive organizational success (Shangze, 2024; Wijonarko, 2024) and a crucial factor in managing a higher education institution (Abror et al., 2020). Loyalty is typically associated with client satisfaction with services or products. Notably, customers will become loyal to a service if they are satisfied with the services.

There are numerous studies on customer satisfaction in various fields, including higher education; however, most studies investigate student satisfaction and loyalty. Despite that, one of the studies on teacher satisfaction conducted by Liu and Zhang (2021) reported that reducing teacher complaints can increase teacher loyalty. The study also discovered that the most common complaints regarding online learning are platform management and platform content. These are related to the technology that supports the online learning platform. Thus, improving technological support is beneficial in overcoming issues in online learning and, as a result, helps reduce teacher complaints.

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However, research on technology readiness, acceptance of technology, and loyalty among academicians in the higher education system is still limited. As we approach the Education 5.0 era, the education system is becoming more challenging, and there is a need to use more technology to deliver knowledge to students. Moreover, during the COVID-19 outbreak, the learning method and process have transformed drastically 360 degrees. Simultaneously, the use of technology in learning is a fundamental and critical component for the continuity of knowledge delivery to the students. Hence, to ensure that students can continue their studies despite the lockdown, various digital learning platforms are used in various institutions of higher learning. As a result, academicians must be well-prepared in terms of technological skills. How the institutions react to this matter is also crucial, as it will be one of the factors that lead to loyalty among academicians.

Therefore, this study aims to explore the effects of the Technology Readiness Index (TRI) using four dimensions, namely optimism, innovativeness, discomfort, insecurity, and academicians' loyalty towards university via the acceptance of technology.

## 2.0 Background of Studies

### 2.1 Technology Readiness Index (TRI)

The phrase "technology readiness" was first used in 2000 by Parasuraman, who defined it as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman, 2000). Prior to the adoption of new technologies or applications, users' acceptance, either positive or negative feelings towards the technology, must be taken into consideration. There are five dimensions to be examined: optimism, innovativeness, discomfort, insecurity, and acceptance.

According to Pangriya and Singh (2021), a user's thoughts, feelings, and perceptions of high-tech goods and services are related to their level of technological readiness. According to earlier research, a user may exhibit negative technological dependence in addition to exhilaration at the same time.

The optimism dimension defines users' positive feelings towards the new technologies. In this dimension, people believe that the technology they use will offer them more confidence and flexibility, boost happiness, and motivate them to achieve goals in their daily tasks. On the other hand, the innovative dimension specifies users' positive feelings towards the new technologies. According to Parasuraman and Colby (2007), the definition of innovativeness is the "tendency to be a technology pioneer and thought leader." An innovative person believes they are in the position of testing new technologies introduced in their field.

Users' negative perceptions of the new technologies are defined by their discomfort aspects. These emotions were described as "a perceived lack of control over technology and a feeling of being overwhelmed by it" (Parasuraman & Colby (2007). According to Yao, Wang and Sun (2025), this emotion often stems from psychological factors such as lack of control, anxiety and perceived complexity, which may be influenced by their preconceived notions about technology. For instance, a lack of support from the technical team and guidance on the use of new technologies or applications may contribute to this dimension. As for insecurity, Parasuraman and Colby (2007) defined this dimension as "distrust of technology and skepticism about its ability to work properly." These negative feelings are natural when new technologies or applications are being introduced. In Education 5.0, though various technologies, applications, and platforms are being introduced, the feeling of insecurity on how stable, convenient, and secure those technologies are contributes to the acceptance of academicians on applying those technologies.

### 2.2 Acceptance of Technology

According to the Technology Acceptance Model (TAM), individuals who perceive technology as useful and simple to use are more likely to develop a positive attitude toward its usage and willingness to adopt and use the technology explained in five key constructs: Behavioral Intention, Actual Use, Perceived Usefulness, Attitude Towards Using, and Attitude Towards Using (Rosita & Fatmasari, 2023). Although there are a few variations of the users' acceptance model, all the models essentially share the same central concept. Every user acceptance model shares the characteristic of individual beliefs about usefulness and simplicity towards acceptance of new technology (van den Berg, 2025).

### 2.3 Loyalty

The degree of happiness or contentment that employees have with their jobs and work environment is known as employee satisfaction. A happy worker will become a devoted worker. A devoted worker will put up the greatest effort possible while working effectively and profitably. Since they are continually thinking about the success of the company, loyal workers are an asset. Employee satisfaction with the technology utilized by the company is one of several elements that influence their loyalty (Chen et al., 2013). According to Chen et al. (2013), technology confirms expectations, which leads to loyalty.

### 2.4 TRI and Loyalty

As online learning in Education 5.0 is conducted through various technologies, platforms, and software, the learning environments are becoming more complex. AL-Hawamleh (2023) explored that user's (students') satisfaction with the e-learning system is a contributing factor to their intention to continue using the system. Thus, it is vital for the management to support the academicians in being ready, accepting, and continuing to use the system for teaching and learning purposes. Prior studies have demonstrated that technology readiness significantly affects satisfaction, which in turn influences positive attitudes toward enhancing contributions to organizational performance (Cimbaljevic et al., 2024). Studies on satisfaction and loyalty were also conducted with regard to the components of technological readiness. It was discovered that while discomfort and insecurity had a negative impact on satisfaction, optimism and

inventiveness had a good impact (Pham et al., 2018).

### 3.0 Conceptual Framework and Hypotheses

The conceptual framework of this study is displayed in Fig. 1. There are six parameters in this study:

- a) Optimism: Refers to a person's belief that technology will give them better ability and flexibility and make them more productive in the delivery of the teaching and learning process.
- b) Innovativeness: This parameter measures a person's support in being engaged and acquiring new technology.
- c) Discomfort: The parameter measures people's negative reaction when dealing with or using technology, whether it is new or something that has been around for a long time.
- d) Insecurity: Insecurity measures the mistrust and cynicism of a person that technology is not beneficial to them.
- e) Acceptance of Technology: This parameter measures acceptance of technology readiness as a tool that helps academicians be good at teaching and learning.
- f) Loyalty: The parameter measures a person's beliefs that the organization they are working in is the right place for them to continue working and be productive while working in the organization and willing to protect the university's image.

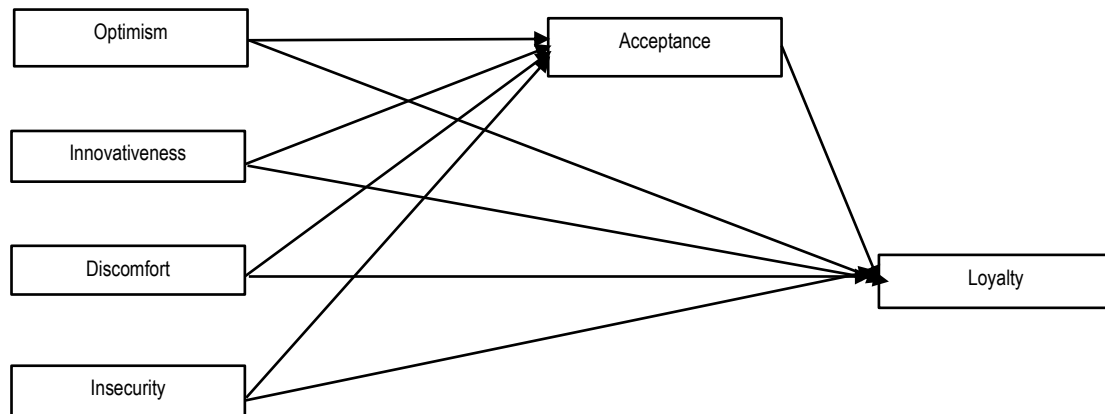


Fig. 1: Conceptual Framework

There are four main hypotheses tested in this study using Partial Least Squares with Structural Equation Modeling (PLS-SEM) analysis procedures:

- i. H1: The acceptance of technology significantly mediated the relationship between optimism and loyalty of lecturers in the higher education learning ecosystem.
- ii. H2: The acceptance of technology significantly mediated the relationship between innovativeness and loyalty of lecturers in the higher education learning ecosystem.
- iii. H3: The acceptance of technology significantly mediated the relationship between discomfort and loyalty of lecturers in the higher education learning ecosystem.
- iv. H4: The acceptance of technology significantly mediated the relationship between insecurity and loyalty of lecturers in the higher education learning ecosystem.

### 4.0 Methodology

As recommended by Creswell (2014), quantitative analysis and survey methods are most appropriate for this study since they aim to evaluate the impacts of the targeted variables by quantitative measurement (i.e., structured questionnaire). To guarantee that every question in the structured questionnaire was fully answered by the respondents, researchers employed a face-to-face data-gathering method to select 206 respondents using the purposive sample methodology. Since the study's sample size is relatively small and simultaneous multiple mediator analysis forms the study's conceptual framework, the PLS-SEM estimation multivariate data technique was employed in the context of statistical analysis (Hair et al., 2017; Ong & Puteh, 2017). The choice of TRI dimensions and acceptance of technology, combined with the objectives of the study and small sample sizes, makes PLS-SEM an appropriate and effective methodology choice. Furthermore, the significance test in this PLS-SEM analysis was computed using the Bootstrapping method, which is thought to be more reliable than the traditional t-test method. Hair et al.'s (2017) recommendation to obtain trustworthy results for empirical t-statistics and Bias-Corrected (BCa) bootstrap. When it comes to determining the mediating impact, Zhao et al. (2010)

recommended the following methods in addition to Hair et al.'s (2017) suggestion to use bootstrapping to assess the significance of the indirect effect coefficient: Consequently, 5,000 sample replications were calculated in accordance with

- If the indirect effect is significant and the path from the independent variable to the dependent variable is not significant, then the mediating effect is a full mediation effect.
- The mediating effect was a partial mediation effect if there was a substantial path from the independent variable to the dependent variable and a significant indirect effect.

## 5.0 Findings

### 5.1 Measurement Model Analysis

According to Hair et al. (2017), Table 1 summarizes that every item included in the measurement model to measure the targeted variables satisfies the minimum threshold value of .70 factor loading. The Average Variance Explain (AVE) for any construct more than .50 (Hair et al., 2017) likewise supports this. Except for the discomfort construct, which has a Cronbach's Alpha value of .696 (Hair et al., 2017), all targeted constructs produced both Composite Reliability and Cronbach's Alpha values above .70. Nonetheless, this result is reasonable since the value is above .60 and extremely near to .70 (Hair et al., 2017). Accordingly, it validates that every variable in this measurement model has an ideal unidimensionality validity (Hair et al., 2017; Ong & Puteh, 2017).

Table 1. Convergent Validity for Measurement Model

Indicator	Loading	AVE	$\gamma$	$\alpha$
Optimism				
(OPT1)	.921**	.811	.945	.922
(OPT22)	.922**			
(OPT3)	.846**			
(OPT4)	.911**			
Innovativeness				
(INN1)	.855**	.816	.946	.924
(INN2)	.921**			
(INN3)	.909**			
(INN4)	.927**			
Discomfort				
(DIS1)	.712**	.619	.829	.696
(DIS2)	.884**			
(DIS3)	.754**			
Insecurity				
(INS1)	.826**	.659	.853	.746
(INS2)	.799**			
(INS3)	.809**			
Acceptance				
(U1)	.829**	.730	.931	.907
(U2)	.911**			
(U3)	.886**			
(U4)	.801**			
(U5)	.841**			
Loyalty				
(LOY1) <sup>a</sup>	.784**	.635	.874	.811
(LOY2) <sup>a</sup>	.823**			
(LOY3)	.727**			
(LOY4)	.847**			

Note: this is a reversed coded indicator; AVE = Average Variance Explained;  $\gamma$  = Composite Reliability;  $\alpha$  = Cronbach's Alpha; \*\* $p < .01$ .

Table 2 provides information regarding the discriminant validity of this measurement model. It indicates that all latent variables completely discriminate from one another when their Heterotrait-Monotrait ratio of correlations (HTMT) ratio value is less than .90, resulting in a positive or negative link between the latent variables. As a result, the set of items intended to test a certain construct measured that construct (Henseler et al., 2010).

Table 2. HTMT Discriminant Analysis for Measurement Model

	(1)	(2)	(3)	(4)	(5)	(6)
(1)	-					
(2)	.440*	-				
(3)	-.206*	-.253*	-			
(4)	-.386*	-.508*	.691*	-		
(5)	.605*	.673*	-.443*	-.581*	-	
(6)	.513*	.339*	-.204*	-.212*	.464*	-

Note: (1) = Optimism; (2) = Innovative; (3) = Discomfort; (4) = Insecurity; (5) = Acceptance; (6) = Loyalty; \* $p < .05$

### 5.2 Structural Model Analysis

The structural model analysis indicates that optimism, innovative, discomfort, and insecurity were able to produce around 55.3% variance explained toward acceptance. In contrast, simultaneously, these four independent latent constructs and mediator latent construct (i.e., acceptance) can produce only 25.7% of variance explained toward loyalty. In terms of effect size and predictive relevance analysis, Table 3 indicates that insecurity has a large effect on the acceptance mediator variable. Meanwhile, optimism has an insignificant effect on the acceptance mediator variable in terms of effect size and predictive relevance criterion. Note that the analysis also indicates that other paths can be considered, given a small effect in terms of effect size and predictive relevance.

Table 3. Structural Model for Measurement Model

Path	$\beta$	t-statistic	p-value	95% BCa Bootstrap	$f^2$	$q^2$	Remark
OPT → U	.332	5.474**	< .01	(.209, .450)	.198	.175	Medium
INN → U	.388	7.183**	< .01	(.285, .494)	.032	.021	Small
DIS → U	-.141	2.480*	.013	(-.252, -.030)	.033	.021	Small
INS → U	-.151	2.351*	.019	(-.273, -.023)	.248	.226	Large
U → LOY	.235	2.335*	.020	(.036, .428)	.033	.019	Small
OPT → LOY	.322	3.523**	< .01	(.132, .492)	.094	.054	Small
INN → LOY	.062	0.710 (NS)	.478	(-.099, .239)	.003	.001	Small
DIS → LOY	-.058	0.786 (NS)	.432	(-.210, .082)	.003	.001	Small
INS → LOY	.104	1.433 (NS)	.152	(-.038, .250)	.009	.007	Small

Note: OPT = Optimism; INN = Innovative; DIS = Discomfort; INS = Insecurity; U = Acceptance; LOY = Loyalty; NS = Not Significant;  $\beta$  = Standardized Beta Coefficient; BCa = Bias Corrected;  $f^2$  = Effect Size;  $q^2$  = Predictive Relevance; The bootstrap samples were 5000 samples; \* $p < .05$ ; \*\* $p < .01$ .

As for the causal analysis, Table 3 depicts that optimism ( $\beta = .332$ ,  $t = 5.474$ ,  $p < .01$ ) and innovative ( $\beta = .388$ ,  $t = 7.183$ ,  $p < .01$ ) have a significant positive effect toward acceptance. In contrast, discomfort ( $\beta = -.141$ ,  $t = 2.480$ ,  $p = .013$ ) and insecurity ( $\beta = -.151$ ,  $t = 2.351$ ,  $p = .019$ ) were discovered to have significant negative effect toward acceptance, based on the t-statistic values that are above the 5% level of significance. Using the same criteria, the analysis also indicates that the path of acceptance toward loyalty was also positively significant ( $\beta = .235$ ,  $t = 2.335$ ,  $p = .020$ ). On the other hand, only optimism ( $\beta = .322$ ,  $t = 3.523$ ,  $p < .01$ ) had a positive significant effect on loyalty, whereas innovative ( $\beta = .062$ ,  $t = 0.710$ ,  $p = .478$ ), discomfort ( $\beta = -.058$ ,  $t = 0.786$ ,  $p = .432$ ) and insecurity ( $\beta = .104$ ,  $t = 1.433$ ,  $p = .152$ ) did not significantly affect loyalty. In addition, by referring to the 95% BCa Bootstrapping confidence interval analysis, the analysis also demonstrates alignment with the t-statistical analysis.

### 5.3 Mediating Analysis

Acceptance is statistically mediating the relationships between OPT → LOY, INN → LOY, DIS → LOY, and INS → LOY concurrently, according to the mediating analysis provided in Table 4. The 95% BCa Bootstrapping confidence interval, which excludes the zero value, and the indirect influence of the coefficient, both significant at the 5% level of error (t-statistics > 1.96), are the causes of this. Regarding the classification of the mediating effect, the analysis indicates that acceptance partially mediated the relationship of OPT → LOY since the direct path of this analysis is statistically significant. However, a different situation occurs when acceptance is discovered to produce a fully mediating effect toward the relationship of INN → LOY, DIS → LOY, and INS → LOY as the direct path of these mediator paths analyses is not statistically significant. Figures 2 and 3 display the results of analysis using the PLS-SEM theory.

Table 4. Indirect Effect Assessment

Indirect Path	IEC	t-statistic	p-value	95% BCa Bootstrap	Direct Path	Remark
OPT → U → LOY	.078	2.113*	.035	(.015, .159)	OPT → LOY**	Partially
INN → U → LOY	.091	2.216*	.027	(.017, .179)	INN → LOY (NS)	Fully
DIS → U → LOY	-.033	2.097*	.043	(-.089, -.004)	DIS → LOY (NS)	Fully
INS → U → LOY	-.035	2.107*	.041	(-.092, -.003)	INS → LOY (NS)	Fully

Note: OPT = Optimism; INN = Innovative; DIS = Discomfort; INS = Insecurity; U = Acceptance; LOY = Loyalty; IEC = Indirect Effect Coefficient; NS = Not Significant; BCa = Bias Corrected; \* $p < .05$ ; \*\* $p < .01$ .

The analysis indicated that innovativeness, discomfort, and insecurity do not have a significant direct effect on loyalty. Instead, influence of loyalty factor is mediated by another variable, which is the acceptance of technology. In essence, acceptance of technology acts as a crucial intermediary. This study suggests the influence of academicians' loyalty through technology-related factors, which focus on enhancing technology acceptance.

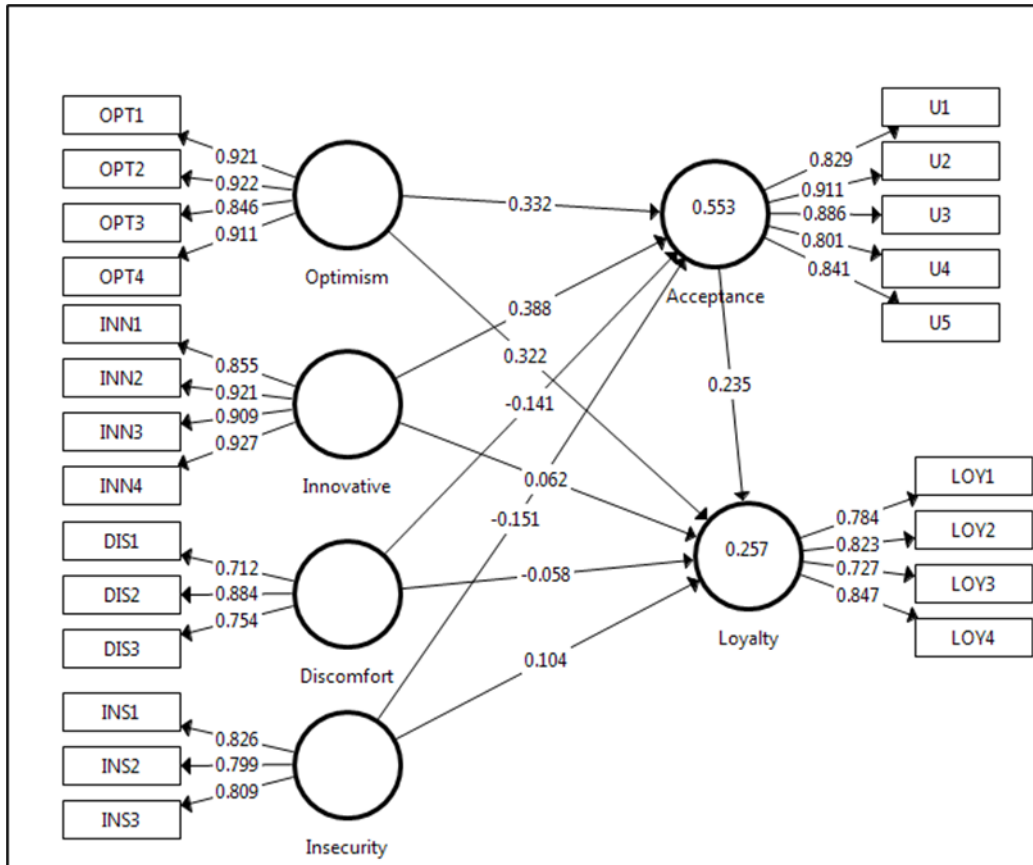


Fig. 2: PLS-SEM Analysis Output for Loading and Path Coefficient Values

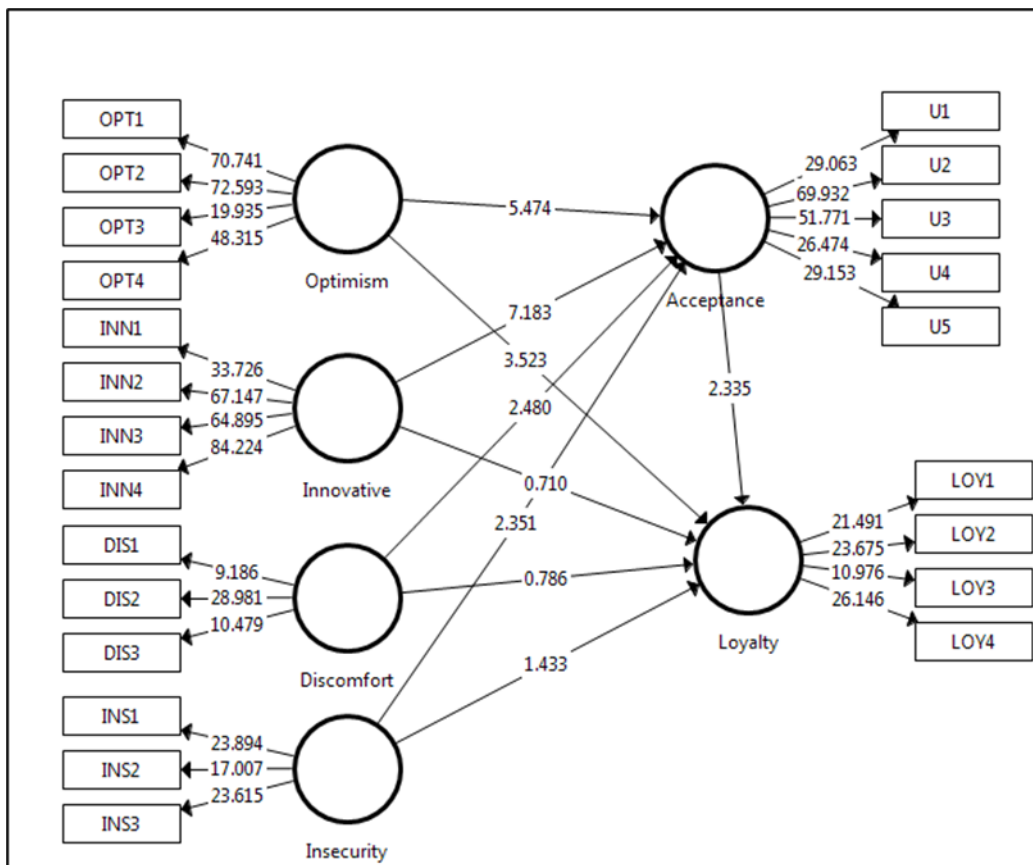


Fig. 3: PLS-SEM Analysis Output for t-statistic Values

## 6.0 Discussion and Conclusion

Based on the findings, it is confirmed academicians who feel optimistic to venture into new technologies are more likely to accept new digital systems and prove their loyalty toward the university. This is aligning with prior research showing the positive technology beliefs enhance its adoption in higher education contexts. Conversely, perceptions of insecurity and discomfort dampen technology acceptance. The investigation results indicate that a high average level of innovativeness and optimism will lead to a high average level of acceptance. Suppose there is a high average of both discomfort and insecurity at the same time. Then, the average degree of acceptance will be low. In a similar vein, loyalty level will be greatly impacted by a high average acceptance level. Additionally, the data reveals that there is a positive correlation between average levels of loyalty and optimism. However, the average amount of loyalty will remain unchanged regardless of any modifications made to the level of innovation, discomfort, or insecurity.

Regarding the mediating impact, it can be deduced that increasing average levels of inventiveness and optimism will raise average levels of acceptance, subsequently raising average levels of loyalty through an indirect process. Likewise, a rise in the mean degree of unease and insecurity will diminish the mean degree of acceptance. Nevertheless, the favorable impact of acceptance on loyalty will tangentially raise the mean degree of loyalty.

Based on these results, it is advisable for the management to ensure that the academicians accept technology. To increase loyalty is to increase the probability of technology acceptance among academicians, thus the focus should be on the components of TRI, and based on the findings, priority should be in the following order:

- i) increase innovativeness,
- ii) increase optimism,
- iii) reduce insecurity,
- iv) reduce discomfort.

Furthermore, work on TRI to discriminate two groups of classification, which are the group of technology-savvy academicians and the less technology-savvy, is another promising direction. Technology-savvy academicians can be described as highly optimistic and innovative academicians with significantly low insecurity and discomfort. Meanwhile, the less technology-savvy group are those who have lower optimism and innovativeness besides being highly insecure and discomfort towards technology.

## 7. Limitations and Recommendations

The limitation of this study is that it cannot be generalized to another institutional level as the study is institution-bound and relevant to the specific university because the data collection was collected from one specific university. Other than that, the sampling technique used is purposive sampling with a smaller sample size. Thus, this study suggests a future direction that examines a wider group besides academicians, such as students, especially during this pandemic, where technology has become crucial to teaching and learning. Population should include multiple higher learning institutes to gauge whether the studied index differs between organizations. A longitudinal study to track and observe the evolution of technology readiness, acceptance, and loyalty among academicians would be beneficial for causal relationships and identifying trends in this study.

Furthermore, future work could explore additional mediating variables such as organizational support, training programs, leadership styles or even the personality traits examined in this study. It is recommended that academicians who need help managing technology be identified, especially in this age where dependencies on technology have significantly increased. Thus, the university can expect to increase loyalty among academicians positively, indirectly increase productivity, and boost the university's image.

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## Paper Contribution to Related Field of Study

This paper contributes to the theories related to TRI, Acceptance of Technology and its relationship with academician loyalty.

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