THE EFFECT OF FACILITATING CONDITIONS AND SELF-EFFICACY ON BEHAVIORAL INTENTION OF SURVEYORS' TOWARD PRACTICE: MODEL EVALUATION

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ABSTRACT
This research study tends to survey the direct effect of moderating variables on behavioural intention to surveying practice. It further purposes to assess the moderating role of self-efficacy on facilitating conditions to behavioural intention to practice. A total number of 84 questionnaires were processed for the analysis with responses coded for the SmartPLS software format. As a rule of thumb, item reliability, construct reliability and validity have a peak range of 0.7 and above. The generally accepted value for average variance extracted (AVE) is 0.5 or greater. The model fit result shows that model was within the Hu & Bentler adopted value less than 0.08 with a SRMR value of 0.073 was reported. This result from the reliability and validity test shows that tests are adequate with the structural analysis showing the self-efficacy is a very important variable, which explains over 70% of intention to practice and 48% of perceived behavioural control. Consequently, the study reveals that behavioural intention to practice surveying depends on the self-efficacy of the practitioner.

Keywords: Intention, latent variables, reliability, self-efficacy, SmartPLS.

1.0 Introduction

The main purpose of information systems as an integrated set of components is to maximize productivity and job performance. Although this scientific area is faced with low acceptance, Due to this, many organizations still struggle with job performance after rejecting technological innovations. Some of the factors perceived to be difficult in usage are those not experienced by intending users. Users become increasingly eager to incorporate information systems into their everyday job activities when they use them more frequently since they have demonstrated their value.

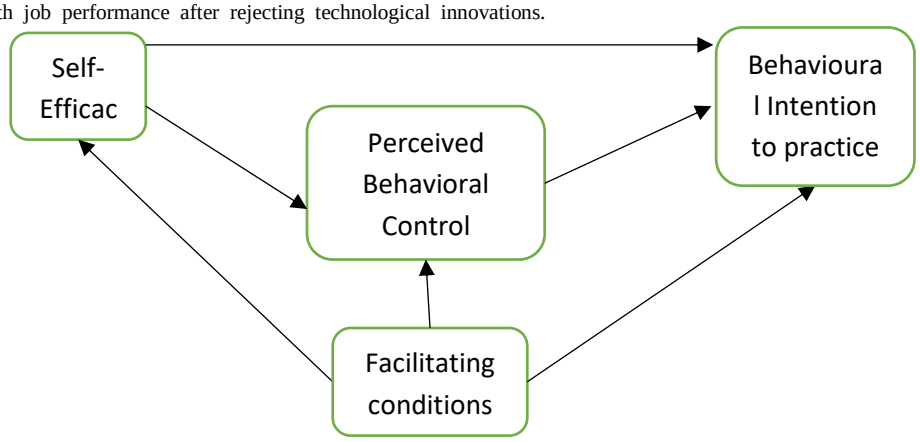

Figure 1: Research Model

Research Problem

There is a need to examine behavioural intention of surveying practitioners to understand the level of technological acceptance through evaluating the factors affecting such intentions. There exist many models that measured the factors influencing behavioural intentions but we need to model the effect of self-efficacy and facilitating conditions on the intentions.

Research Objectives

This study focused on evaluating the factors (facilitating conditions and self-efficacy) that affect behavioural intention to accept technology. For this reason, we tested the selected factors on how they influence behavioural intention and their correlation.

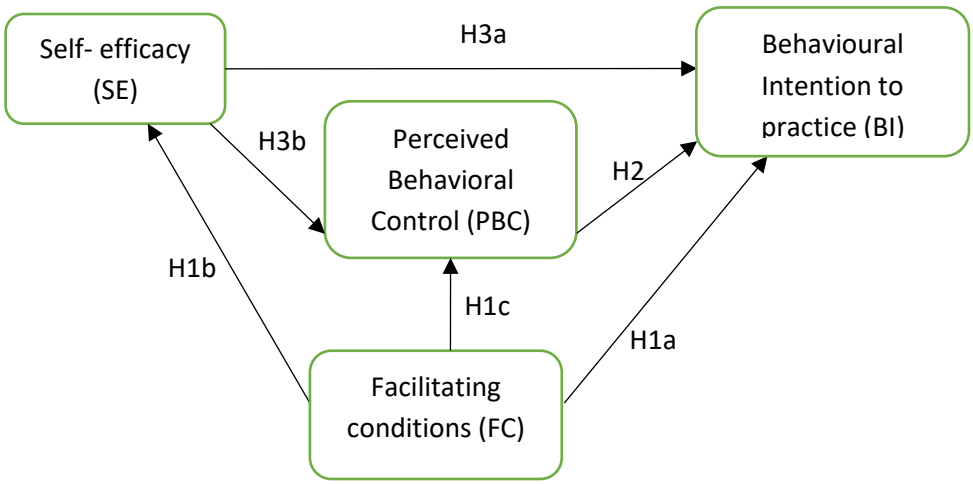

Figure 2. Hypothesis framework

As mentioned above, both facilitating conditions and self-efficacy affect people's perceived behavioral control and behavioral intention towards using technology. In light of the fact that perceived behavioral control directly influences behavioral intention, we were able to create the fundamental model for this research in the framework by combining TAM and TPB.
H1a FC has a positive impact on BI.
H1b: FC has a positive effect on SE.
H1c: FC has a positive impact on PBC.
H2: PBC has a positive impact on BI.
H3a: SE has a positive impact on BI.
H3b: SE has a positive impact on PBC.

Significance of the study
In recent studies, many variables have been identified in the theory of user acceptance of information technology for studying intentions and perceptions (Oduwole, 2021). Different theories have been postulated with varying factors. However, some major variables and their corresponding effects on intention to engage in surveying practice have low research coverage therefore this study significantly highlights two basic variables in determining behavioral intentions.

LITERATURE REVIEW

Technology Acceptance Model (TAM)
In this model we identified two main constructs; perceived usefulness and perceived ease of use determine the adoptability of a computer system by a user. In this study we will corroborate the discovery on the connections between user's belief, their attitude and usage. Factor studies further indicate that perceived usefulness and perceived ease of use are statistically different dimensions (Swanson, 1987).

Structural equation modelling (SEM)
Structural equation modelling is a statistical tool for modelling and simultaneously analysing the correlation between exogenous and endogenous variables. This modelling tool performs multivariate functions and allows many aspects of statistical and equation analysis such as simple linear regression, multiple regression and confirmatory factor analysis to mention a few. SEM is unique in that it includes both structural and measurement models. The inner model connects the latent variables, while the measurement model links the observed to latent variables.

Self-efficacy (SE)
An individual's unique belief is termed self-efficacy and determines how well he or she can execute an action plan in hypothetical situations (Bandura, 1977). Self-efficacy is the belief that one can do something or achieve a goal. It includes confidence in one's ability to manage conduct, control one's environment, and maintain motivation in the pursuit of goals Self-efficacy is a quality that people can develop in situations and areas, including relationships, careers, and other important areas

Facilitating Condition (FC)
Facilitating condition refers to the availability and accessibility of the resources and support that are needed to use technology effectively. For example, facilitating condition can include the quality and reliability of a wireless network, or availability of technical support, and the compatibility of the technology with the systems in place as well as the laws and rules that control how technology is used. In several of these research, it was discovered that where both the performance expectancy (PE) and effort expectancy (EE) constructs were present in the model. Therefore, it is important to consider facilitating conditions as a dynamic and contextual factor that can affect the acceptance and use of technology in different situations.

Perceived Behavioral Control
Perceived behavioural control (PBC) can be defined as an individual's assessment of the degree of difficulty associated with doing a specific action. It is simply assessing how one easily conducts a task. It is considered that the whole set of accessible control beliefs—beliefs regarding the existence of elements that might help or hinder the completion of the behaviour—determines perceived behavioural control.

RESEARCH METHODS

Research Methodology
The SmartPLS 3 software of Structural Equation Modelling was adopted for the statistical analysis. SEM is a simultaneous multiple-equation technique that can be used to estimate models with single or multiple items on both sides of the equations. SEM has grown very wide to become the most popular statistical estimation technique in the social sciences and many other sciences.

Research Instrument
Eighty-four (84) usable samples structured with the five-point Likert scale were collected from practitioners in three states Oyo, Ogun and Lagos, the indicators built with indicator questions that can suitably measure the constructs intended for and conform to the theoretical model. Self-efficacy and Facilitating conditions are independent variables for perceived behavioural control and behavioural intention to practice. Behavioural intention to practice is the main latent construct by the other variables. Out of the 84 questionnaires distributed with questions attached to each indicator.

Findings

4.3 Measurement Model
This part of the framework is the measurement model that examines the correlation between the latent variables. The factors (exogenous and endogenous variables) are the predictors in the measurement model (Hoyle 1995, 2011; Kline 2010).

Reliability and validity
The composite reliability (CR), average variance extracted (AVE), and factor loadings of the outer model were used to test the convergent validity first. A composite dependability of at least 0.7 is required. 0.6 or greater is appropriate for exploratory study (Bagozzi and Yi, 1988). According to Table 1, every loading for this investigation was greater than 0.7. The AVE shows the overall amount of variance explained by the latent construct with values greater than the advised average of 0.5 (Hair et al., 2014). The loadings reveal that the items reflect the constructs at levels far above 70%.

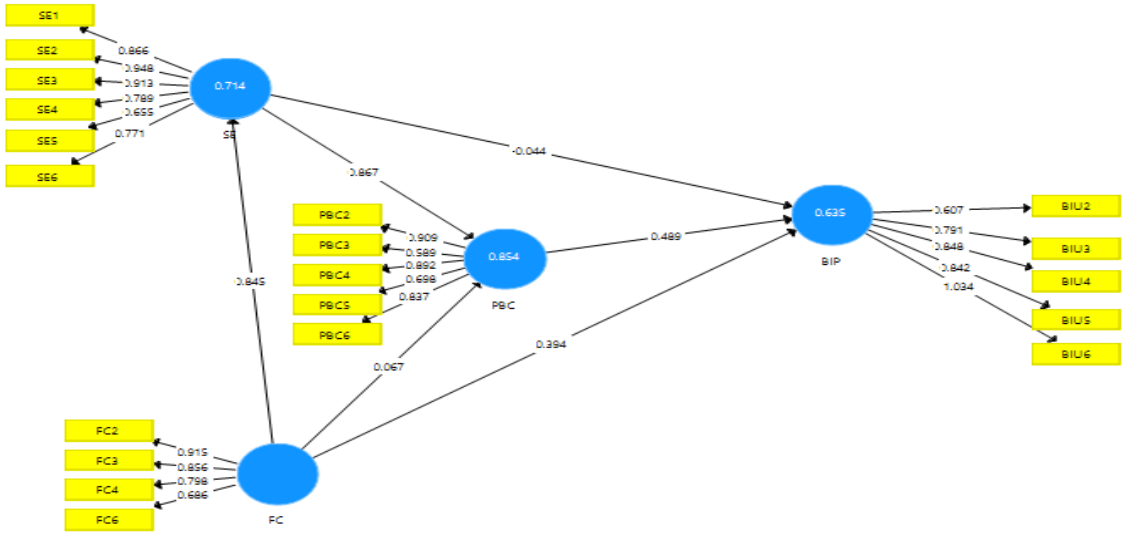

Figure 1: Results of PLS-SEM Analysis (inner and outer models)

Outer Loadings

	BIP	FC	PBC	SE
BIU2	**0.714**			
BIU3	**0.858**			
BIU4	**0.882**			
BIU5	**0.912**			
BIU6	**0.945**			
FC2		**0.915**		
FC3		**0.916**		
FC4		**0.859**		
FC6		**0.755**		
PBC2			**0.908**	
PBC3			**0.745**	
PBC4			**0.887**	
PBC5			**0.797**	
PBC6			**0.834**	
SE1				**0.829**
SE2				**0.920**
SE3				**0.914**
SE4				**0.870**
SE5				**0.753**
SE6				**0.855**

Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
BIP	**0.915**	**0.938**	**0.937**	**0.750**
FC	**0.885**	**0.898**	**0.921**	**0.746**
PBC	**0.892**	**0.909**	**0.920**	**0.699**
SE	**0.928**	**0.937**	**0.944**	**0.737**

The discriminant validity, which follows the aforementioned analysis, shows that each construct is measured separately and not as a reflection of other variables. Low correlations between the assessed construct and other constructs show this. The recommendation made by Fornell and Larcker in 1981—according to which the square root of the AVE in each latent variable should be greater than other correlation coefficients among the latent variables—was implemented. So, the square root of AVE was calculated and bold diagonals were used to construct Table 2.

Discriminant Validity

Fornell-Larcker Criterion

	BIP	FC	PBC	SE
BIP	0.866			
FC	0.686	0.864		
PBC	0.705	0.723	0.836	
SE	0.694	0.775	0.853	0.859

The validity was further tested using heterotrait-monotrait (HTMT) (Henseler, Ringle, & Sarstedt, 2015), and all the values were below 0.85 except Self-Efficacy and Perceived Behavioural Control with value 0.917. These variables lack discriminant validity according to Hemseler et al, but it is sufficient following the rule of 0.90.

Heterotrait-Monotrait Ratio (HTMT)

	BIP	FC	PBC	SE
BIP				
FC	**0.751**			
PBC	**0.761**	**0.795**		
SE	**0.737**	**0.843**	**0.917**	

This further suggests that some items in self-efficacy are measuring the same thing in perceived behavioural control. In other words, items of the former construct contains overlapping items from the respondents' view in these affected constructs (Hamid et al 2017).

4.4 Structural Model
Structural Model (Inner model and Fit Analysis)
Model Fit

Fit Summary

	Saturated Model	Estimated Model
SRMR	0.073	0.073
d_ULS	1.133	1.133
d_G	0.986	0.986
Chi-Square	396.816	396.816
NFI	0.775	0.775

Focus is placed on discovering the structural model's prediction abilities, as shown by the coefficient of determination (R2), cross-validated redundancy (Q2), also known as predictive relevance, path coefficients, and effect sizes (f). This was achieved through a bootstrapping procedure with resample of 5000.
Examining the inner model show that PBC has the highest impact on Behavioral Intention (0.342) followed by Facilitation Conditions (0.318) and Self-Efficacy (0.156). This suggests that PBC has a more significant effect on Behavioral Intention to Practice than Facilitating Conditions and Self-Efficacy. Although, PBC strongly depends on Self-Efficacy as Facilitating Conditions sufficiently reflects Self-Efficacy at over 77%. This implies that Self-Efficacy is a strong mediating variable between FC and PBC as it explains the dependent and independent variables sufficiently but a weak mediator for Behavioral Intention to Practice.

R-Square

	R-Square	R-Square Adjusted
BIP	0.568	0.551
PBC	0.737	0.730
SE	0.601	0.596

The value here in BIP is 0.568 (57%) and SE is 0.601 (60%) which are considered moderate and a PBC of 0.737 (74%) is rated high impact relationship.
Effect sizes (F^2)

According to Samar et al 2018, the effect size F^2 have values ranging from 0.02 as small, 0.15 as medium and 0.35 as large. Path SE-BIP and FC-PBC are low, while FC-BIP is mid-range with others like PBC-BIP, SE-PBC and FC-SE on the over-effect regions.

F Square

	BIP	FC	PBC	SE
`BIP				
FC	0.090		0.036	**1.505**
PBC	0.071			
SE	**0.012**		**0.815**	

Accordingly, the hypotheses were tested with the path analysis to determine the significance between variables. A 5000 bootstrapping resample was run as suggested and the table below demonstrates the PLS estimation results.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
H1a = FC -> BIP	0.318	0.309	0.177	1.794	**0.073**
H1b = FC -> PBC	0.154	0.155	0.092	1.686	**0.092**
H1c = FC -> SE	0.775	0.773	0.065	11.933	**0.000**
H2 = PBC -> BIP	0.342	0.348	0.126	2.712	**0.007**
H3a = SE -> BIP	0.156	0.160	0.167	0.934	**0.350**
H3b = SE -> PBC	0.733	0.730	0.087	8.414	**0.000**

Construct Crossvalidated Redundancy

	SSO	SSE	Q^2 (=1-SSE/SSO)
BIP	420.000	252.389	0.399
FC	336.000	336.000	
PBC	420.000	212.818	0.493
SE	504.000	286.708	0.431

CONCLUSION

From the results obtained in the measurement and structural model analysis, it is suggested that facilitating conditions and self-efficacy are very important predictors to behavioural intentions. This was further explained by the weights of the latent variables. It is obvious that perceived behavioural control significantly influence and predicts behavioural intention more than facilitating conditions and self-efficacy. Although, the impact of perceived behavioural control on behavioural intention is increased by self-efficacy. Also, facilitating conditions influences self-efficacy. Therefore, self-efficacy can be termed the mediating factor between facilitating conditions and perceived behavioural control.
This study hereby suggest that before a conclusion is made on the behavioural intention of individuals their self-efficacy should be measured as it tends to explain if a person has high intentions towards a particular behaviour.

RECOMMENDATIONS

The study has demonstrated the importance of variables, indicators, and the influence of the chosen constructs and manifest on survey methodology. The practice and intentions of professional surveyors toward a particular behaviour can be tested using the model along with their influencing factors. These data help us comprehend the surveyors' decision-support mechanism. However, the following is what I recommend:
i. Additional statistical analysis techniques should be used to verify the statements made in this study.
ii. Using the factors recognized in the models as dependable may help us understand the intention and perspective of other professionals under investigation.
iii. The PLS_SEM SmartPLS is suggested and recommended for assessing model fit.

Policy Implications

There are few but important implications from this study for surveying practitioners. In this study, we highlighted that predictors influencing the intention to use a particular technology. The main factors influencing this are facilitating conditions and self-efficacy. We hereby suggest that further valid inferences can be made from the results in this study.

REFERENCES

Bagozzi, R. P. & Yi, Y. (1988). On the Evaluation of Structural Equation Models. Journal of the Academy of Marketing Science, 16(1), 74-94. doi:10.1007/BF02723327

Gold, A., Malhotra, A. & Segars, A. (2001). Knowledge Management: An Organizational Capabilities Perspective. J. of Management Information Systems, 18, 185-214.

Hair, J. F., Hult, G. T., Ringle, C. & Sarstedt, M. (2013). A primer on partial least squares structural equation modeling (PLS-SEM). Sage, Thousand Oak

Hauser, J. R. and Shugan, S. M. (1980). Intensity Measures of Consumer Preference. Operation Research, 28(2), 278-320.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A New Criterion for Assessing Discriminant Validity in Variance-based Structural Equation Modeling. Journal of the Academy of Marketing Science, 43, 115-135. doi:10.1007/s11747-014-0403-8

Hoyle, R. H. (1995). Structural equation modeling: concepts, issues, and applications. Sage, Thousand Oak.

Hoyle, R. H. (2011). Structural equation modeling for social and personality psychology. Sage, London.

Hu, L. T. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Struct Equ Modeling 6(1):1–55.

Jeon, J. (2015). The Strengths and Limitations of the Statistical Modelling of Complex Social Phenomenon: Focusing on SEM, Path Analysis, or Multiple Regression Models. World Academy of Science,Engineering and Technology. International Journal of Social, Behavioural, Educational, Economic,Business and Industrial Engineering, 9, 1634-1642.

Kline, R. B. (2006). Reverse arrow dynamics. Formative measurement and feedback loops. In: Hancock GR, Mueller RO (eds) Structural equation modelling: A second course. Information Age Publishing, Greenwich.

Kline, R. B. (2010). Principles and practice of structural equation modelling. Guilford Press, New York.

Kline, R. B. (2011). Principles and practice of structural equation modelling. New York: Guilford Press.

Larcker, D. F. & Lessig, V. P. (1980). Perceived Usefulness of Information: A Psychometric Examination, Decision Sciences, 11(1), 121–134.

Oduwole, A. (2021). The relationship of attitude and perceived behavioural control on behavioural intention to practice surveying. Proceedings of the West Africa Built Environment Research (WABER) Conference 2021. West Africa Built Environment Research (WABER) Conference, pp1059. ISBN 9780620953672 Available at https://centaur.reading.ac.uk/103974.

Swanson, E. B. (1987). 'Information channel disposition and use', Journal of Decision Science, Vol. 18, No. 1, pp.131–145.

Tarka, P. (2018). An Overview of Structural Equation Modeling: Its Beginnings, Historical Development, Usefulness and Controversies in the Social Sciences. Quality and quantity, 52(1), 313-354.