Measurement model for e-campus acceptance: A study in semi-private higher institutions in Malaysia

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Abstract. Previous efforts to validate instruments to measure constructs related to technology acceptance have been very successful. However, little is known of its validity in private higher learning institution especially in religious based institution. We present an established and validated instrument to be revalidated in religious based higher learning institution. The scale involved in this validation study is technical proficiency, computer anxiety, satisfaction and innovativeness. Findings indicates that all subscale demonstrated adequate reliability and validity. Implications for future research are discussed.

1. Introduction

Information system acceptance studies provide various of useful models, theories and individual constructs for information system researchers to better understand the potential outcome of the studies. However, these models need to be tested for their validity and reliability first. For example [1] states that technical proficiency construct should get validated with an external sample frame. The purpose of this study is to established empirically validated instrument the information system construct namely technical proficiency, computer anxiety, satisfaction and innovativeness. To achieve this purpose, we used the mixture of classic and modern type of validity and reliability testing such as exploratory factor analysis, composite reliability, average variance extracted and Cronbach alpha

2. Literature review

Information system acceptance study often use standardized tests, instruments, and scales as part of their research. To ensure that the scale correctly assesses what they aim to calculate, reliability and validity must be demonstrated. This study will include several information system acceptance constructs as follows

2.1. Technical proficiency

Technical proficiency in information system was first introduced by[1]. According to [1] the extent of technological competence of the users should be taken into account when planning the implementation
of information systems. However, there is still no precise measurement of technical proficiency on terms of its construct validity and reliability and it is suggested that this concept should be developed.

2.2. Computer anxiety
According to [2] computer anxiety serves as an important moderator toward continuance intention and study by found that [3] computer anxiety has a positive effect on perceived usefulness of Web CT. Study by[4] found that there is a significant relationship between computer anxiety and intention to use e-learning. Study by[5] found that computer anxiety are important antecedents of perceived ease of use, and perceived usefulness. While [6] study explores factors that influence the continuance usage Intention of Learning Management System and calls for future research to include computer anxiety as a potential factor that could explain the acceptance of the information system.

2.3. Satisfaction
According to[7] Satisfaction is defined as an emotional state evoked by an overall assessment with the service provider of interactive experiences. Previous studies have shown the significant effects of satisfaction on continuance intention to use information system. For example, [8] study found that users’ satisfaction positively affects e-learning systems continuance intention in academic libraries. Another study by[9] also found that satisfaction positively affects continuance intention. Study by found that [10] the user satisfaction of internet banking has a positive influence on user continuance intention of internet banking. While study by [11] found that user satisfaction is positively related to continuance intentions for the social networking and microblogging groups.

2.4. Innovativeness
Study by[12] found that innovativeness plays a critical role in building consumers' continuance intention. While study by[13] innovativeness has a direct positive impact on perceived ease of using m-commerce. Study by[14] found that students’ innovativeness has a positive impact on the behaviour intention of animation usage. Study by [15] also found that user’s innovativeness in the domain of information technology positively influences the online purchase intention. Study by [16] demonstrate that innovativeness has a moderation effect between perceived need and purchase intention of mobile-RFID services. Study by[17] hypothesized that consumer innovativeness has a positive effect on the intention to adopt the healthcare wearable technology

3. Methodology
This study aims to study the level of e-campus acceptance among private university students in Malaysia. In order to meet the objectives of the study, this study used descriptive quantitative study design. The study data were collected at a private university based on Islamic studies using convenience sampling. This sampling technique is used due to the absence of a sampling frame. Based on the Krejcie and Morgan tables if the study population is 1700 then the sample is 313. The instruments used in this study were taken from the relevant literature. All study constructs were measured using a 5-point Likert scale with 5 being ‘Strongly Agree’ and 1 being ‘Strongly Disagree’ with the exception of demographic variables. In this study, a 21-item questionnaire was developed

4. Data analysis
The 21 items from the previous validated instrument was subjected to principle component factor analysis with ‘varimax’ rotation. No cross-loading issues were identified after the inspection of the whole item. As demonstrated in Table 2, a final four-factor model was estimated with the 21 items. The factor solution accounted for 74.940 percent of the total variance. Bartlett’s test of sphericity was significant (p < .000) and KMO measure of sampling adequacy (.871) surpassed the recommended value of 0.5 [18] which suggests that the factor analysis was considered a valuable factor model validation. By means of the principal component analysis, four factors have emerged with the Eigenvalue score of more than 1 suggesting evidence of the construct validity of the scale.
### Table 1. Initial test of an EFA

| Criteria                        | score  | Cut-off | remark     |
|---------------------------------|--------|---------|------------|
| KMO (sampling adequacy)         | .871   | 0.5     | accepted   |
| Bartlett's Test of Sphericity   | 0.000  | p<0.05  | accepted   |

### Table 2. Cross loadings

| Rotated Component Matrixa       |        | Component |
|---------------------------------|--------|-----------|
|                                 | 1      | 2         | 3         | 4         |
| tech2                           | .880   | 0.004     | .278      | .056      |
| tech1                           | .875   | -.016     | .245      | .040      |
| tech3                           | .851   | 0.020     | .236      | .102      |
| tech4                           | .838   | 0.026     | .283      | .089      |
| tech5                           | .673   | -.008     | .425      | .146      |
| tech6                           | .588   | 0.171     | .194      | .217      |
| anxiety3                        | -.041  | .888      | 0.021     | .157      |
| anxiety4                        | -.017  | .842      | 0.055     | .132      |
| anxiety2                        | .188   | .833      | 0.076     | .081      |
| anxiety6                        | -.024  | .830      | 0.098     | .215      |
| anxiety5                        | -.152  | .829      | 0.080     | .269      |
| anxiety1                        | .298   | .632      | 0.125     | .086      |
| satis3                          | .299   | .053      | .852      | .077      |
| satis4                          | .308   | .052      | .826      | .083      |
| satis2                          | .260   | .150      | .817      | .159      |
| satis5                          | .329   | .149      | .779      | .112      |
| satis1                          | .252   | .074      | .739      | .227      |
| innov3                          | -.021  | .256      | .255      | .850      |
| innov2                          | .232   | .193      | .046      | .846      |
| innov4                          | .047   | .316      | .185      | .828      |
| innov1                          | .242   | .117      | .112      | .806      |

### Table 3. Reliability of the scale

| Scale                      | No of items | Cronbach α | Composite reliability | AVE  |
|----------------------------|-------------|------------|-----------------------|------|
| Technical proficiency      | 6           | 0.918      | 0.908                 | 0.628|
| Computer anxiety           | 6           | 0.919      | 0.921                 | 0.661|
| satisfaction               | 5           | 0.920      | 0.901                 | 0.646|
| innovativeness             | 4           | 0.908      | 0.900                 | 0.693|
5. Discussion
In this research, we set out to contribute to the literature of information system acceptance by empirically testing and validating a measurement for use in quantitative research. The instrument used a rigorous procedure to operationalize the concept of information system acceptance by assessing content validity, construct validity and reliability. The study also has implications for practice. This research provides a validated instrument that managers can use as a diagnostic tool to assess the degree to which e-campus has been accepted in their respective university. This will allow the university’s managers to identify opportunities to improve the system.

6. Conclusion
This study however, has several limitations. The first limitation is that this study only performs an exploratory factor analysis to validate the construct. The future study should perform a confirmatory factor analysis to further validate the construct.

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