International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 02 | Feb 2020 www.irjet.net p-ISSN: 2395-0072

Campus E-voting in a Developing Nation: An Application of the Unified Theory of Acceptance and Use of Technology (UTAUT) Model

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Abstract - *The purpose of the paper is to determine the perceptions of students towards campus e-voting in Malaysia by applying the Unified Theory of Acceptance and Use of Technology (UTAUT) Model. A self-administered questionnaire was distributed among 300 students undertaking bachelor degree in a public higher institution in Federal Territory of Labuan, Malaysia. A descriptive investigation was performed via the Statistical Package for the Social Sciences (SPSS) computer program version 23.0 on factors such as performance expectancy, effort expectancy, social influence, trust in the university, trust in the Internet, computer anxiety, and behavioural intention. Result inferred that of the twenty-eight measurement items, statement "If I have access to an online voting system, I will be more likely to vote" derived from performance expectancy factor leading the list with highest mean values. This is followed by two statements: "People who are important to me think that I should use an online voting site", and "I would find an online voting site useful". The first derived from social influence factor, and the latter from performance expectancy factor. This result infers that students have positive perceptions towards campus e-voting. Direction for future research is also explained.*

Key Words: E-Voting, Performance Expectancy, Effort Expectancy, Social Influence, Trust, Computer Anxiety

1. INTRODUCTION*)*

E-voting refers to "casting a ballot via a broader range of electronic telecommunications technology including telephones, cable and satellite television, and computers without internet connection" (Gibson, 2001, p. 564). This study termed campus electronic voting (i.e. campus e-voting) as the voting activities in campus conducted electronically. A study by Suki and Suki (2017) noted that students' decision-making and satisfaction in campus e-voting strongly influenced by voters' commitment to vote. When the university enforce a condition for compulsory campus e-voting, students would feel that it is their obligation to do so independently with freedom. They also highly trusted the viability and accuracy of the system to receive the campus e-voting results on the same day of the voting day.

What's more, campus e-voting delivers another vital trait that is it "saves voters' time and energy from long queues and complex voting processes and procedures" (Suki & Suki, 2017). Besides, accessibility to candidate's manifesto is also made possible. Accordingly, the purpose of this paper is to determine the perceptions of students towards campus e-voting in Malaysia by applying the Unified Theory of Acceptance and Use of Technology (UTAUT) Model. The subsequent section presents the literature review associated to UTAUT Model, followed by the methodology applied in this study. Following is the empirical results that examine the goals of the research. Conclusion and direction for future research are presented in the final section.

2. LITERATURE REVIEW

The UTAUT model was developed by Venkatesh, Morris, Davis, and Davis (2003) recognises performance expectancy, effort expectancy, social influence, and facilitating conditions as direct determinants of behavioural intention to use an information system and use behaviour (see Figure 1). The present study applies the UTAUT model for the guiding principles to examine consumers' intention to determine the perceptions of students towards campus e-voting.

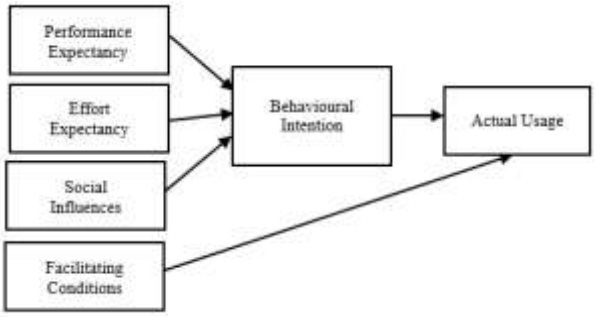

Fig -1: Unified theory of acceptance and usage of technology

Performance expectancy is defined as the "degree to which a person believes that using a particular system will enhance his or her performance" (Davis, 1989, p. 320). Research by Venkatesh, Thong, and Xu (2012) asserted that of all the UTAUT factors, performance expectancy was the leading predictor that affect one's intention to use technology. These significant results also found in the works of Realpe-Muñoz, Collazos, Hurtado, Granollers, Muñoz-Arteaga, and Velasco-Medina (2018), Suki and Suki (2016), and Venkatesh et al. (2003). This study refers performance expectancy as the belief that using campus e-voting would enhance students' performance.

Effort expectancy refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). The ease of use of the technology necessitates individuals to devote only minimal effort in using it (Venkatesh et al., 2003). Preceding works by Arman and Hartani (2015) and Realpe-Muñoz et al. (2018) reported that users' performance is delighted when the system is easy to use. In other words, effort expectancy positively impacted one's intention to use a technology. In this study, effort expectancy is considered as the belief that using campus e-voting would be easy to use with minimal effort.

Social influence is defined as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451). It is akin to "the perceptions of what friends, family, work colleagues and neighbours think of the particular behaviour" (DeMagaad, Chew, Huang, Khan, Sreenivasan, & LaRose, 2013, p. 112). Social influence was found to affect one's behavioural intention to use technology, as acknowledged by Hsu and Lu (2004). Similar significant discovery in the works of Alaiad and Zhou (2014). The present research refers social influence as social pressure and influence on student's intention to campus e-voting.

Trust is "the willingness of an individual to accept an action offered by another individual with the hopes that the other party will perform the task without having to monitor the said party" (Mayer, Davis, & Schoorman, 1995, p. 709). Trust is also associated to self-assurance towards using the system which affects their actual use (Khalil & Nasrallah, 2014; Powell, Williams, Bock, Doellman, & Alan, 2012). Akin to that, preceding scholars also uphold the same thought that trust influenced one's intention to use a system and actual usage (AboSarma, AbdelHafez, Assassa, & Mursi, 2017; Thompson & Jaeger, 2003). However, students with minimal trust to the system deters intention to use e-voting system, as stressed by Schaupp (2005).

Besides, computer anxiety is defined as "the individual feels uncomfortable or anxious when using or being expected to interact with a computer" (Howard & Smith, 1986, p. 611). Consumers with this type of characteristics have strong refusal to use the technology and they find it difficult to learn to use it (Fliotsos, 1992). Their intention to use it will rise when they instill lower level of computer anxiety (Fliotsos, 1992). This study mentions computer anxiety as student's rejection to use campus e-voting.

3. METHODOLOGY

A self-administered questionnaire was distributed among 300 students undertaking bachelor degree in a public higher institution in Federal Territory of Labuan, Malaysia. Of this, 62.3% of the respondents were female, and 37.7% were male. In regards of age group, more than three-quarter of the respondents (80%) aged between 21 and 22 years old, and 20% aged from 19 to 20 years. Data were collected using convenience sampling technique over a period of two-week. The questionnaire was designed in two-section: Section A contained questions that assessed demographic characteristics of the respondents. Section B consisted questions related to respondent's perception towards e-voting in respect to aspects performance expectancy, effort expectancy, social influence, trust in the university, trust in the Internet, computer anxiety, and behavioural intention. The questionnaire items were adapted from Venkatesh et al. (2003) and were measured on a 5-point Likert scale with some amendments to reflect the present study. A descriptive investigation was performed via the Statistical Package for the Social Sciences (SPSS) computer program version 23.0 on factors such as performance expectancy, effort expectancy, social influence, trust in the university, trust in the Internet, computer anxiety, and behavioural intention.

4. DATA ANALYSIS

This section details descriptive results concerning the perceptions of students towards campus e-voting on factors such as performance expectancy, effort expectancy, social influence, trust in the university, trust in the Internet, computer anxiety, and behavioural intention.

4.1 Performance Expectancy

Table 1 describes the frequency, percentage, means, and standard deviation for each of the four indicators of performance expectancy. The mean values vary among the factor items with the majority of respondents opt for 4 = agree or 5 = strongly agree for all of the items. Means ranges between 3.533 and 3.613. Statement "If I have access to an online voting system, I will be more likely to vote" had highest mean score. Precisely, more than half of respondents (68%) have expressed positive agreement on this statement, followed closely by statement "I have enough knowledge to differentiate between permissible and forbidden stuffs". Further, respondents reported that they belief online voting site is beneficial and the system is easy to use to take part in elections with mean values of 3.577, and 3.563, respectively. On the other hand, statement "Using an online voting site would enhance my efficiency in voting in elections" had the lowest mean score among the four statements that belong to performance expectancy.

Table -1: Descriptive Statistics for Performance Expectancy

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard deviation
"I would find an online voting site useful."	26 (8.7)	66 (22.0)	0 (0)	125 (41.7)	83 (27.7)	3.577	1.328
"Using an online voting site would enhance my efficiency in voting in elections."	25 (8.3)	76 (25.3)	0 (0)	112 (37.3)	87 (29.0)	3.533	1.357
"Using an online voting system would make it easier to participate in elections."	31 (10.3)	58 (19.3)	5 (1.7)	123 (41.0)	83 (27.7)	3.563	1.346
"If I have access to an online voting system I will be more likely to vote."	22 (7.3)	71 (23.7)	1 (0.3)	113 (37.7)	93 (31.0)	3.613	1.333

Note: Percentages are in parentheses

4.2 Effort Expectancy

Effort expectancy consisted four measurement items. To discover respondents' perceptions about this factor, descriptive statistics for each item were checked. Table 2 details that on a five-point likert scale, statement "I believe that interacting with an online voting site would be a clear and understandable process" had highest mean score (M=3.513). Besides, 66% of the respondents has positive thought regarding "It would be easy for me to become skilful at using an online voting site" with means = 3.473. Only 3% of the respondents had neutral perception towards this statement. Indeed, respondents also expressed that "learning to use an online voting site would be easy for them" (M=3.433). On the other hand, the lowest mean score (M=3.397) appeared in statement "I would find an online voting site easy to use".

Table -2: Descriptive Statistics for Effort Expectancy

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard deviation
"I believe that interacting with an online voting site would be a clear and understandable process."	33 (11.0)	65 (21.7)	4 (1.3)	111 (37.0)	87 (29.0)	3.513	1.389
"It would be easy for me to become skilful at using an online voting site."	33 (11.0)	60 (20.0)	9 (3.0)	128 (42.7)	70 (23.3)	3.473	1.335
"I would find an online voting site easy to use."	40 (13.3)	67 (22.3)	5 (1.7)	110 (36.7)	78 (26.0)	3.397	1.419
"Learning to use an online voting site would be easy for me."	32 (10.7)	70 (23.3)	12 (4.0)	108 (36.0)	78 (26.0)	3.433	1.371

Note: Percentages are in parentheses

4.3 Social Influence

The next factor namely social influence entailed three items. All mean values surpassed 3.00 on a five-point likert scale (ranged from 3.470 to 3.580), inferring respondents mainly agreed on these statements (see Table 3). The first referred to statement "People who influence my behaviour think that I should use an online voting site". Besides, statement "People who are important to me think that I should use an online voting site" had highest mean score of the three measurement items. Specifically, most respondents (68%) agreed, while 31% disagreed, and 1% neutral on this statement. Indeed, 65% of the participants revealed that they "would use an online voting site because of the proportion of friends and co-workers who will use it". This statement had mean score of 3.503.

Table -3: Descriptive Statistics for Social Influence

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard deviation
"People who influence my behaviour think that I should use an online voting site."	20 (6.7)	76 (25.3)	6 (2.0)	139 (46.3)	59 (19.7)	3.470	1.247
"People who are important to me think that I should use an online voting site."	27 (9.0)	63 (21.0)	4 (1.3)	121 (40.3)	85 (28.3)	3.580	1.333
"I would use an online voting site because of the proportion of friends and co-workers who will use it."	24 (8.0)	75 (25.0)	6 (2.0)	116 (38.7)	79 (26.3)	3.503	1.328

Note: Percentages are in parentheses

4.4 Trust in the University

Respondents also provided response to aspect of trust in the university which contained three statements. Table 4 particulars results of the descriptive statistics with mean scores among the factor items ranged from 3.433 and 3.457. More than half of the participants (54%) reported that "they think they can trust the university". Indeed, this statement was discovered to have highest mean score. Furthermore, statement "In my opinion, the university is trustworthy" was the next essential item of trust in the university factor with mean values of 3.437. Descriptively, 27% of the respondents strongly agreed with this statement. Additionally, many respondents (64%) imparted a positive perception that "The university can be trusted to carry out online voting transactions faithfully", and only a small portion of the respondents (10%) strongly disagreed to this statement.

Table -4: Descriptive Statistics for Trust in the university

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard deviation
"I think that I can trust the university."	40 (13.3)	63 (21.0)	5 (1.7)	104 (34.7)	88 (29.3)	3.457	1.436
"The university can be trusted to carry out online voting transactions faithfully."	30 (10.0)	74 (24.7)	4 (1.3)	120 (40.0)	72 (24.0)	3.433	1.351
"In my opinion, the university is trustworthy."	35 (11.7)	71 (23.7)	2 (0.7)	112 (37.3)	80 (26.7)	3.437	1.400

Note: Percentages are in parentheses

4.5 Trust in the Internet

The subsequent factor, trust in the Internet, composed of six indicators. Considerable means variation exists among the factor items. In detail, majority of respondents selecting 4 = agree or 5 = strongly agree for all of the items. Means ranges between 3.347 and 3.523 (see Table 5). The first referred to statement "The internet has enough safeguards to make me feel comfortable using it to vote", and the latter referred to statement "I trust that internet votes will be accurately counted". Ensuing to the latter measurement item, more than half of the participants (54%) expressed positively towards this statement, while only 2% provided neutral perception.

When asked about statement "I would trust the security of an online voting system", a quarter of the participants strongly agreed, while 39% agreed to this statement. In terms of perception that "the Internet is a safe environment for online voting", 64% of the respondents agreed on this statement. Coherent to this positive perception, they "strongly felt assured that legal and technological structures adequately protect them from problems on the Internet" (mean = 3.410). Of the six statements of trust on the Internet factor, statement "I trust that online votes will not be tampered with" was found to have the lowest mean score (mean=3.373).

Table -5: Descriptive Statistics for Trust in the Internet

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard deviation
"The internet has enough safeguards to make me feel comfortable using it to vote."	38 (12.7)	74 (24.7)	3 (1.0)	116 (38.7)	69 (23.0)	3.347	1.395
"I feel assured that legal and technological structures adequately protect me from problems on the Internet."	31 (10.3)	82 (27.3)	2 (0.7)	103 (34.3)	82 (27.3)	3.410	1.401
"I trust that internet votes will be accurately counted."	19 (6.3)	84 (28.0)	6 (2.0)	103 (34.3)	88 (29.3)	3.523	1.335
"I think that the internet is now a safe enough environment for online voting."	40 (13.3)	63 (21.0)	5 (1.7)	116 (38.7)	76 (25.3)	3.417	1.406
"I would trust the security of an online voting system."	20 (6.7)	85 (28.3)	4 (1.3)	117 (39.0)	74 (24.7)	3.467	1.309
"I trust that online votes will not be tampered with."	42 (14.0)	65 (21.7)	4 (1.3)	117 (39.0)	72 (24.0)	3.373	1.412

Note: Percentages are in parentheses

4.6 Computer Anxiety

To discover respondents' perceptions about the subject of computer anxiety, mean values for the five factor items were calculated, and results were presented in Table 6. On a five-point likert scale, this statement had mean scores between 2.770 and 2.893. Precisely, close to sixty percent (i.e. 57%) of the participants disagreed that "they feel apprehensive about using an online voting system", whereas 55% disagreed that "they would hesitate to use an online voting system for fear of making mistakes they cannot correct". Additionally, 56% also disagreed that "their vote could be lost using an online voting system when hitting the wrong key". What's more, more than half of the respondents (56%) also disagreed and strongly disagreed with the statement "an online voting system would be somewhat intimidating to me".

Table -6: Descriptive Statistics for Computer Anxiety

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard deviation
"I feel apprehensive about using an online voting system."	47 (15.7)	125 (41.7)	1 (0.3)	67 (22.3)	60 (20.0)	2.893	1.436
"I am unsure of my ability to learn to use an online voting system."	63 (21.0)	109 (36.3)	2 (0.7)	86 (28.7)	40 (13.3)	2.770	1.406
"I would hesitate to use an online voting system for fear of making mistakes I cannot correct."	48 (16.0)	116 (38.7)	6 (2.0)	93 (31.0)	37 (12.3)	2.850	1.347
"An online voting system would be somewhat intimidating to me."	63 (21.0)	104 (34.7)	5 (1.7)	88 (29.3)	40 (13.3)	2.793	1.406
"It scares me to think that my vote could be lost using an online voting system by hitting the wrong key."	52 (17.3)	117 (39.0)	2 (0.7)	83 (27.7)	46 (15.3)	2.847	1.399

Note: Percentages are in parentheses

4.7 Behavioural Intention

Behavioural intention be made up of three items. Table 7 shows all mean values surpassed 3.00 on a five-point likert scale (ranged from 3.490 to 3.549), inferring respondents mainly agreed on the three statements. Importantly, 65% of the respondents reported that "they would not hesitate to use an online voting site to vote in future elections", whereas a very small portion of the respondents (8%) strongly disagreed to this statement. Indeed, they expressed that "they could see themselves using an online voting system to participate in future elections", with 40% strongly agreed, and 28% agreed towards it. Plus, majority of the respondents (66%) "would use an online voting site to vote in political elections". However, of the three statements, this aspect had the lowest mean values i.e. 3.490.

Table -7: Descriptive Statistics for Behavioural Intention

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Standard deviation
"I would use an online voting site to vote in political elections."	30 (10.0)	70 (23.3)	2 (0.7)	119 (39.7)	79 (26.3)	3.490	1.436
"I could see myself using an online voting system to participate in future elections."	33 (11.0)	58 (19.3)	6 (2.0)	119 (39.7)	84 (28.0)	3.543	1.406
"I would not hesitate to use an online voting site to vote in future elections."	24 (8.0)	77 (25.7)	3 (1.0)	101 (33.7)	94 (31.3)	3.549	1.347

Note: Percentages are in parentheses

5. CONCLUSION AND RECOMMENDATION

This study determined the perceptions of students towards campus e-voting in Malaysia by applying the UTAUT Model. Perceptions based on aspects like performance expectancy, effort expectancy, social influence, trust in the university, trust in the Internet, computer anxiety, and behavioural intention were assessed. Result of the descriptive analysis reported that Result inferred that of the twenty-eight measurement items, statement "If I have access to an online voting system, I will be more likely to vote" derived from performance expectancy factor leading the list with highest mean values. This is followed by two statements: "People who are important to me think that I should use an online voting site", and "I would find an online voting site useful". The first derived from social influence factor, and the latter from performance expectancy factor. This result deduces that students have different perceptions towards campus e-voting. They would develop strong intention to use campus e-voting when they see that the system is useful, and easy to use with minimal effort. The system would save their time and effort to cast for a vote.

This research furnishes imperative theoretical and practical contributions. On the theoretical side, this study applies the UTAUT Model to explain descriptive of aspects of performance expectancy, effort expectancy, social influence, trust in the university, trust in the Internet, computer anxiety, and behavioural intention towards campus e-voting in Malaysia. Hence, the discovery advances the existing studies which mainly executed in Western countries. On the practical side, developer of the e-voting system should develop less complex e-voting system to encourage for more usage. Besides, top management at university should evoke students' interest to use e-voting system during selection of students' representative council at the university. What's more, the same concept should be employed in the appointment of dean, and top management at faculties.

Future research is suggested to expand the size of sample coverage beyond Malaysia context to uncover a more generalized insight concerning campus e-voting. Additionally, structural relationships to assess nexus among performance expectancy, effort expectancy, social influence, trust in the university, trust in the Internet, and computer anxiety with behavioural intention to use campus e-voting is a bright avenue for investigations. Besides, moderating role of gender, and age may produce differing perspectives on each of this factor.

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