

Validating the Extending Unified Theory of Acceptance and Use of Technology (UTAUT2) to Assess the Impact of Social Networking Sites Use on Students' Academic Performance

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Abstract

This pilot study examined the validity of the UTAUT 2 model after adding variables to make it more appropriate for Kuwait's educational context. 38 items that measure the variables are adapted from existing literature and modified to suit Kuwait context. The instruments passed through reliability and validity assessments to ensure completeness and clarity of the measures. 36 valid data were gathered from teachers who use educational Social Networking Sites (SNSs) at Kuwait higher education. The data analyzed using Jamovi. The results showed a sufficient level of reliability for all instruments except SNSs Conditions which scored a low and unacceptable level of internal consistency, and this variable was dropped. Confirmatory Factor Analysis to verify the validity of the items revealed that all items met the suggested criteria, except items BI4 and UB1 which were dropped. These assessments confirm the validity of the extended model for a full-scale study in Kuwait context.

Keywords: Educational Social Networking Sites, Teacher Perception of Students' Academic Performance, UTAUT2, Kuwait, Pilot study.

1. Introduction

Information and Communication Technologies (ICT) have transformed traditional teaching and learning techniques into a more active and dynamic condition. Face-to-face contact is no longer the sole way for teachers and students to communicate. In current years, Higher Education Institutions (HEIs) recognize that Social Networking Sites (SNSs) such as Facebook, Myspace, and LinkedIn have the potential to become a shared platform that encourages cooperation and engagement among educational stakeholders (such as students, teachers, and higher educational institutions) when used well and for purely educational purposes [10]. SNSs are “web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system.” [5].

The integration of SNSs into the higher education environment has excited many teachers as a new educational technology [2]. Teachers revealed that educational SNSs have become a tool that can supplement learning systems for fostering virtual classroom experiences, wherein students across the globe can join in simultaneously to learn and share their ideas [2]. Moreover, teachers believe that educational SNSs are effective tools that can be used to promote and achieve active and collaborative learning experiences for students, which may improve their academic performance [10]. From the teachers' perspective, student academic performance in this study can be defined as the degree of teacher perception of students' ability to carry out academic tasks when using educational SNSs. It is measured in terms of the anticipated grade and the achievement patterns (e.g., acquiring new skills, and bolstering perseverance) [10]. Measuring student academic performance from different perspectives (such as teachers' perspective) is important in

judging the effectiveness and success of any educational institution (as a knowledge provider in the community), the teacher's way of teaching, and the decisions made by decision-makers [2].

In Kuwait's context, HEIs are interested in enhancing the learning process by encouraging using ICT tools in education at the national level. This is to facilitate better communication between educational stakeholders (such as students and teachers). Also, both parties are freed of the constraints of being in the same place at the same time, which ultimately may lead to improved academic performance [1]. Despite the acceptance of SNSs in HEIs as a platform where students connect with their peers and teachers, limited studies have been conducted in Kuwaiti HEIs regarding the impact of using educational SNSs on students' academic performance from teachers' perspective [1]. Therefore, this pilot study aims to translate, adapt, and validate the application of the extending Unified Theory of Acceptance and Use of Technology (UTAUT 2). Also, it tests the proposed additional variables that might be used to extend the UTAUT2 model to make it more appropriate for educational settings. This study's research question is: How can the UTAUT2 model be effectively adapted, validated, and translated for use in educational settings? This will subsequently contribute- to future research- to predicting factors that could affect students' academic performance when using educational SNSs from teachers' perspectives in Kuwait's higher education.

This study is organized as follows: The next section presents the theoretical framework, followed by a section that illustrates the methodology. After that, findings and discussions will be presented, and the last section provides the study's conclusion.

2. Theoretical Framework

Extending Unified Theory of Acceptance and Use of Technology (UTAUT2) was designed by Venkatesh et al. in 2012, and it is an extension of the Unified Theory of Acceptance and Use of Technology (UTAUT) that was designed in 2003 [11]. UTAUT 2 is considered one of the most recent and extensively IS models utilized in general because it combines eight different models which are the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model (MM), the Theory of Planned Behavior (TPB), a model combining the technology acceptance model and the theory of planned behavior, the model of PC utilization, the innovation diffusion theory, and the social cognitive theory [3], [11]. Moreover, UTAUT2 can explain about 74% of the variation in the intention to use a given technology and about 52% of the variance in technology use [11]. According to [11], UTAUT2 can be applied to mandatory and voluntary systems [11]. Therefore, it was selected for this study because the constructs in the UTAUT2 model best explained the variables used in the study. Also, it was mentioned that UTAUT2 is applicable and recommended for study in the educational field [3].

UTAUT2 has seven main factors- which will be discussed next- and moderators that influence individuals' behavioral intention and individuals' usage behavior toward technology use [11]. In this study, All the factors relating to UTAUT2 are considered except the following has been excluded: price value, since the SNSs are free, and the users (such as students and teachers) don't have to pay any fees to subscribe. Also, the moderators did not consider because the participants are all in the same field and they are college teachers. Based on the literature, there are suggestions for future studies to extend the model to study the effect of information technology implementation on performance in general [3], [11]. Also, technology efficacy (or internet efficacy) and compatibility were found to be among the five topmost UTAUT2 extensions that could have an impact on individuals' behavioral intention and individuals' usage behavior [3]. Therefore, this study will extend the UTAUT2 model by adding Teacher Perception of Students' Academic Performance as a dependent variable, while Perceived Technology Efficacy and Perceived compatibility will be added as independent variables. This makes the model more appropriate for educational settings. UTAUT2 constructs and the additional constructs that are used to extend the model are defined in this study as follows:

- Performance expectancy (PE): Describes teacher's expectations of the usefulness of educational SNSs for students [6], [11]

- Effort Expectancy (EE): Explains the teacher's point of view regarding the students' possibility of using educational SNSs without much effort. It describes the degree of simplicity and ease of use of educational SNSs [6], [11].
- Social Influence (SI): The degree to which a teacher perceives that people important to the student (such as teachers, colleagues, and friends) believe he/she should use educational SNSs [6], [11].
- SNSs Conditions (SNSsC): The degree to which a teacher believes that the students have the necessary resources to use educational SNSs [11].
- Hedonic Motivation (HM): Explains the teacher's point of view on students' fun or pleasure derived from using educational SNSs [11].
- Habit (HT): The teacher's perspective on the extent to which students tend to perform behaviors automatically because of learning [6], [11].
- Behavioral intention (BI): The measure of teachers' perceptions of students' intention strength to use educational SNSs in achieving their educational goals [4].
- Use behavior (UB): The teacher's point of view on the degree to which a student uses the capabilities of an educational SNSs in terms of nature, extent, quality, and appropriateness of use [4].
- Perceived Technology Efficacy (PTE): The teacher's perspective on the extent to which students' ability to learn when using educational SNSs [8].
- Perceived Compatibility (PC): The teacher's view of the degree to which educational SNSs are perceived as being consistent with existing utility values, needs, and experiences of students [9].

Figure 1 shows the proposed research model, noting that all the variables will be measured from the teachers' perspective.

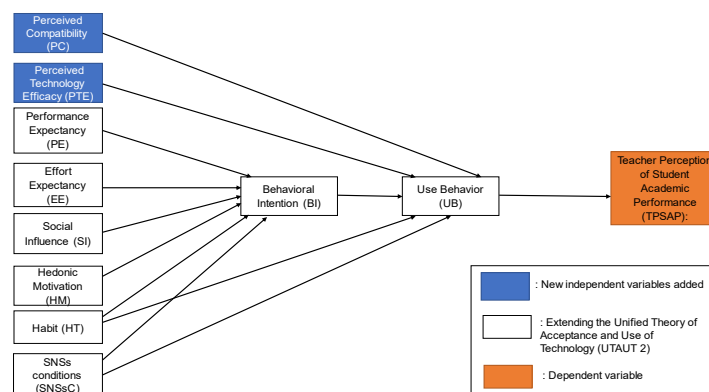


Fig. 1. Proposed research model.

3. Methodology

3.1 Data Collection

The total target population is teachers who use educational SNS -such as myU application which is one of the most popular social networking applications used in Kuwait- in the Public Authority for Applied Education and Training (PAAET) colleges -as PAAET is one of the public HEIs in Kuwait- which number 538 teachers. According to [7], if the total target population is more than 500, the sample size will be around 217. For a pilot study, researchers recommend different sample sizes. In general, the larger the sample, the more accurate the results are. A sample size between 12 and 30 is recommended [7].

For this pilot study, the Management Department in the College of Business Studies at PAAET was selected. The data was collected by applying the survey method (structured questionnaire). The questionnaire was distributed online to participants via Survey Monkey to teachers who use myU application. To reach them, they were contacted through myU application (by sending a direct message to them via the application itself) to inform them about the questionnaire and their volunteer participation in it. After that, the questionnaire

was sent to them for their participation. Out of the 66 questionnaires that were administered to the participants, 36 valid data were gathered which would be analyzed to deduce findings for this study.

3.2 Instruments Development

The instruments are adapted from [11] and related previous studies that are based on the UTAUT2 framework. The development of instruments was carefully made to reflect the nature of the study. Hence, the questionnaire was created and included 38 items for this study. Five items for BI are adapted from [4]. Similarly, PE, EE, SI, SNSsC, HM, and HT are measured with three items each, adapted from [6], and [11] respectively. Also, there are four items for UB adapted from [4]. Regarding newly introduced variables, PTE and PC, three items are used to measure each of the variables. The items are adapted from [8, 9] respectively. Finally, for TPSAP four items are adapted from [10]. The items were measured using the five-point Likert Scale (5 = 'Strongly Agree' and 1= 'Strongly Disagree'). Moreover, because the respondents were Arabic speakers, it was vital for the questionnaire to be precisely translated from English to Arabic. Therefore, a back translation was performed, which is a procedure extensively applied to test the precision of the translation in a cross-cultural survey.

3.3 Pre-test the Survey Questions

A pre-test was conducted before the pilot test to ensure that the respondents understood the questionnaire items well, to rectify any inadequacies before administering the final questionnaire to the target respondents, and thus reduce biases [7]. The content validity of the instruments was reviewed and evaluated by three experts in the field of IS and education from Kuwait University. The experts were required to evaluate items as a whole through personal interviews. These experts gave their views and suggestions about the content of each of the dimensions included in the questionnaire. For example, the experts suggested adding what is called a fishing question among the questionnaire questions. It is the deliberate inclusion of a specific instruction or statement within the survey designed to identify respondents who may not be carefully reading or paying attention to the questions. Also, adding filtering questions to collect correct and complete data. Lastly, changes were made to the questionnaire based on their feedback.

3.4 Data Analysis

The instrument of the current study undergoes item analyses namely, reliability and validity. Reliability is the assessment of the consistency of the instrument in measuring the concept it is intended to measure [7]. While validity is the assessment of how well the instrument measures the concept [7]. For this study, Cronbach's Alpha was performed to check the reliability, while A Confirmatory Factor Analysis (CFA) was performed to check the validity of the items by using Jamovi 2.3.21.

4. Findings

36 faculty members from the College of Business Studies at PAAET participated in the pilot study. In general, 38-item questionnaires were distributed to the respondents, which took 7 minutes to answer. Among the respondents, 11 respondents were males, and 25 respondents were females. In addition, only 1 respondent was ≤ 30 years old, while 9 respondents were between 31 and 40 years old, 16 respondents were between 41 and 50 years old, 9 respondents were between 51 and 60 years old, and only 1 respondent was above 61 years old. Furthermore, 12 respondents were associate professors, 3 respondents were lecturers, 6 respondents were teachers, 11 respondents were teacher assistants, and only 1 respondent was full professor. Finally, 2 respondents stated that they have been using myU for 1 to 2 years, another 4 respondents said they have been using myU for less than 1 year, and 30 respondents said they have been using myU for more than 2 years. Full results can be seen in Table 1.

Table 1. Respondents Profile.

	ITEMS	PERCENT
GENDER	Male	11 (30.6%)
	Female	25 (69.4%)
AGE	Under 30	1 (2.8%)
	31-40	9 (25.0%)
	41-50	16 (44.4%)
	51-60	9 (25.0%)
	61+	1 (2.8%)
COLLEGE	College of Business Studies	36 (100.0%)
ACADEMIC RANK	Full Professor	1 (2.8%)
	Associate Professor	12 (33.3%)
	Lecturer	3 (8.3%)
	Teacher	6 (16.7%)
	Assistant Teacher	11 (30.6%)
HOW LONG HAVE YOU BEEN USING MYU?	Less than 1 year	4 (11.1%)
	1-2 years	2 (5.8%)
	More than 2 years	30 (83.3%)

4.1 Descriptive Statistics

The results showed that the mean score for BI was 3.80, which shows that most answers were around the fourth choice (agree). The mean score of the UB was 3.53, which indicates that most of the answers were between 'neutral' and 'agree'. In addition, PTE scored a mean of 4.21, indicating that most answers were 'agree'. The mean scores for PC and PE were 3.81 and 3.67, between 'neutral' and 'agree'. The mean scores for EE, SI, and SNSsC were 4.08, 4.12, and 4.03, respectively, indicating that most responses were 'agree'. The mean scores for HM (3.67) and HT (3.78) were between 'neutral' and 'agree'. Finally, the answers to TPSAP scored a mean of 3.42, closer to 3 (neutral). These results are illustrated in Table 2.

Table 2: Descriptive Statistics

		N	Minimum	Maximum	Mean	Std. Deviation
Behavioral Intention (BI)	BI1	36	3	5	4.08	.841
	BI2	36	2	5	4.11	.820
	BI3	36	1	5	3.92	1.052
	BI4	36	2	5	2.86	1.046
	BI5	36	3	5	4.06	.754
User Behavior (BU)	UB1	36	2	5	2.86	1.046
	UB2	36	2	5	3.83	.811
	UB3	36	1	5	3.78	1.174
	UB4	36	2	5	3.67	.828
Perceived Technology Efficacy (PTE)	PTE1	36	3	5	4.08	.732
	PTE2	36	3	5	4.22	.681
	PTE3	36	2	5	4.33	.926
Perceived Compatibility (PC)	PC1	36	1	5	3.75	.841
	PC2	36	2	5	4.03	.810
	PC3	36	1	5	3.67	1.014
Performance Expectancy (PE)	PE1	36	1	5	3.75	.967
	PE2	36	1	5	3.44	.969
	PE3	36	1	5	3.83	.845
Effort Expectancy (EE)	EE1	36	3	5	4.03	.736
	EE2	36	3	5	4.19	.624
	EE3	36	2	5	4.03	.774
Social Influence (SI)	SI1	36	1	5	4.11	1.190
	SI2	36	1	5	4.25	1.052
	SI3	36	2	5	4.22	.959
	SI4	36	1	5	3.92	1.273
SNSs Conditions (SNSsC)	SNSsC1	36	3	5	4.53	.654
	SNSsC2	36	3	5	4.19	.624
	SNSsC3	36	1	5	3.39	.871
Hedonic Motivation (HM)	HM1	36	2	5	3.67	.828
	HM2	36	2	5	3.69	.822
	HM3	36	2	5	3.56	.969
Habit (HT)	HT1	36	2	5	3.61	.838
	HT2	36	2	5	3.86	.899
	HT3	36	1	5	3.89	.854
Teacher Perception of Student Academic Performance (TPSAP)	TPSAP1	36	1	5	3.83	1.028
	TPSAP2	36	1	5	3.47	.971
	TPSAP3	36	1	5	3.25	.937
	TPSAP4	36	1	5	3.14	.990
Valid N (listwise)		36				

4.2 Reliability of the Scale

Cronbach's alpha was calculated on the sample of 36 participants to ensure the instrument was reliable. [7] highlighted that a cut-off point of 0.7 is required to consider the research instrument is reliable with a valid internal consistency, on which any value below 0.7 is considered poor and unacceptable, above 0.8 excellent, and above 0.9 will be considered perfect [7]. Table 3 shows a sufficient level of reliability for all instruments except SNSs Conditions which scored a low and unacceptable level of internal consistency of Cronbach Alpha below 0.7; thus, this variable was dropped from the study. After dropping the unaccepted variable, these results showed a sufficient level of reliability of the scale which means the scale is useful to be used in the full data collection.

Table 3: Cronbach Alpha Acceptance Levels

Variable	Items	Mean	SD	Item-rest correlation	If item dropped Cronbach's α	Cronbach's α
Behavioral Intention (BI)	BI1	4.08	0.841	0.826	0.798	0.861
	BI2	4.11	0.820	0.848	0.794	
	BI3	3.92	1.052	0.764	0.810	
	BI4	2.86	1.046	0.325	0.929	
	BI5	4.06	0.754	0.789	0.813	
User Behavior (UB)	UB1	2.86	1.046	0.225	0.836	0.728
	UB2	3.83	0.811	0.564	0.653	
	UB3	3.78	1.174	0.643	0.588	
	UB4	3.67	0.828	0.775	0.539	
Perceived Technology Efficacy (PTE)	PTE1	4.08	0.732	0.695	0.696	0.805
	PTE2	4.22	0.681	0.708	0.696	
	PTE3	4.33	0.926	0.599	0.827	
Perceived Compatibility (PC)	PC1	3.75	0.841	0.770	0.684	0.828
	PC2	4.03	0.810	0.603	0.840	
	PC3	3.67	1.014	0.713	0.748	
Performance Expectancy (PE)	PE1	3.75	0.967	0.707	0.900	0.885
	PE2	3.44	0.969	0.810	0.806	
	PE3	3.83	0.845	0.825	0.803	
Effort Expectancy (EE)	EE1	4.03	0.736	0.822	0.851	0.904
	EE2	4.19	0.624	0.786	0.889	
	EE3	4.03	0.774	0.838	0.840	
Social Influence (SI)	SI1	4.11	1.190	0.794	0.895	0.915
	SI2	4.25	1.052	0.807	0.890	
	SI3	4.22	0.959	0.784	0.901	
	SI4	3.92	1.273	0.868	0.870	
SNSs Conditions (*)	SNSsC1	4.53	0.654	0.272	0.583	0.555
	SNSsC2	4.19	0.624	0.590	0.144	
	SNSsC3	3.39	0.871	0.299	0.612	
Hedonic motivation (HM)	HM1	3.67	0.828	0.780	0.726	0.846
	HM2	3.69	0.822	0.738	0.766	
	HM3	3.56	0.969	0.641	0.870	
Habit (HT)	Habit1	3.61	0.838	0.570	0.863	0.825
	Habit2	3.86	0.899	0.803	0.627	
	Habit3	3.89	0.854	0.684	0.756	
Teacher Perception of Student Academic Performance (TPSAP)	TPSAP1	3.83	1.028	0.699	0.893	0.896
	TPSAP2	3.47	0.971	0.778	0.863	
	TPSAP3	3.25	0.937	0.784	0.861	
	TPSAP4	3.14	0.990	0.823	0.846	

SNSs Conditions (*) Variable to be dropped due to low Cronbach alpha below 0.7

4.3 Validity Analysis

Confirmatory Factor Analysis (CFA) was performed to check the validity of the items. Regarding CFA analysis, it is recommended for factor loadings to be above 0.4, and any factor loading value below 0.4 will be dropped from the study [7]. Table 4 represents the first run of the data, all items recorded a value above 0.4 except items BI4 and UB1 were

dropped. Therefore, a modification is required in the second run. In Table 5, which represents the second run, all of the items scored the accepted level of factor loadings, associated with the significance level of 0.05, as the lowest factor loading in the data set is 0.571 belongs to the item (PC2). Thus, this test confirms the validity of the research model.

Table 4: Confirmatory Factor Analysis (First Run)

Factor	Indicator	Loadings
Behavioural Intention (BI)	BI1	0.851
	BI2	0.930
	BI3	0.885
	BI4 (*)	0.329
	BI5	0.892
User Behaviour (UB)	UB1 (*)	0.257
	UB2	0.626
	UB3	0.849
	UB4	0.974
Perceived Technology Efficacy (PTE)	PTE1	0.747
	PTE2	0.943
	PTE3	0.617
Perceived Compatibility (PC)	PC1	0.899
	PC2	0.570
	PC3	0.855
Performance Expectancy (PE)	PE1	0.853
	PE2	0.867
	PE3	0.830
Effort Expectancy (EE)	EE1	0.863
	EE2	0.861
	EE3	0.900
Social Influence (SI)	SI1	0.592
	SI2	0.975
	SI3	0.987
	SI4	0.690
Hedonic Motivation (HM)	HM1	0.780
	HM2	0.989
	HM3	0.601
Habit (HT)	Habit1	0.746
	Habit2	0.654
	Habit3	0.611
Teacher Perception of Student Academic Performance (TPSAP)	TPSAP1	0.657
	TPSAP2	0.740
	TPSAP3	0.902
	TPSAP4	0.964
(*) BI4 and UB1 were dropped due to low factor loadings		

Table 5: Confirmatory Factor Analysis (Second Run)

Factor	Indicator	Loadings
Behavioural Intention (BI)	BI1	0.845
	BI2	0.931

Factor	Indicator	Loadings
User Behaviour (UB)	BI3	0.887
	BI5	0.894
	UB2	0.612
	UB3	0.842
	UB4	0.986
Perceived Technology Efficacy (PTE)	PTE1	0.746
	PTE2	0.944
	PTE3	0.616
Perceived Compatibility (PC)	PC1	0.899
	PC2	0.571
	PC3	0.854
Performance Expectancy (PE)	PE1	0.852
	PE2	0.868
	PE3	0.830
Effort Expectancy (EE)	EE1	0.862
	EE2	0.863
	EE3	0.899
Social Influence (SI)	SI1	0.591
	SI2	0.974
	SI3	0.987
	SI4	0.689
Hedonic Motivation (HM)	HM1	0.780
	HM2	0.989
	HM3	0.601
Habit (HT)	Habit1	0.746
	Habit2	0.654
	Habit3	0.611
Teacher Perception of Student Academic Performance (TPSAP)	TPSAP1	0.658
	TPSAP2	0.740
	TPSAP3	0.902
	TPSAP4	0.964

5. Discussions

The analysis results showed a sufficient level of reliability for all instruments except SNSs Conditions which scored a low and unacceptable level of internal consistency of Cronbach Alpha below 0.7, therefore this variable was dropped. This is because the specific indicators may not be sufficient in their representation of the construct. Also, this was anticipated by experts in the pre-testing phase before the pilot study. Because the study participants were teachers, they may not have known whether students had the necessary resources to use educational SNSs such as the internet and devices. This also could be the reason behind dropped items BI4 and UB1 when the Confirmatory Factor Analysis to verify the validity of the items revealed that these items had outer loading below the acceptance range of 0.40. Teachers, for their part, do not know whether students recommend using educational SNSs (regarding BI4), nor do they know whether students use educational SNSs for interacting with peers (regarding UB1). However, these assessments confirm the validity and reliability of the research model for a full-scale study in Kuwait's educational context. which means the researcher will carry on conducting the full data collection from the sample size.

6. Conclusion

This paper sought to validate the UTAUT 2 model after adding variables to make it more appropriate for educational settings. The study adapted 38-item measures from existing literature and modified them in accordance with Kuwait's educational context. Out of the 66 questionnaires that were administered to the participants, 36 were returned as usable, which is adequate for a pilot study. The results showed a sufficient level of reliability for all instruments except SNSs Conditions which scored an unacceptable level of internal consistency, and this variable was dropped. The results also revealed that all items met the suggested criteria for verifying the validity of the items, except items BI4 and UB1 which were dropped. Overall, this paper highlights the importance of the pilot study and its contribution to the development of best practices in information systems research in the education field. The response during the pilot study from teachers confirmed that the instruments were suitable for the main study, and this was a crucial outcome. Moreover, it was evident from this study that in the education context extending UTAUT 2 could be an effective research framework in accessing teachers' perception of the impact of education SNSs on students' academic performance.

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