Cross-cultural Validation of UTAUT: The Case of University VLEs in Jordan, Russia and the UK

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Abstract: Virtual Learning Environments (VLEs) are learning platforms within universities aiming to facilitate and enhance students' learning. In order to increase the chances for success of VLEs implementation it is essential to identify the factors which influence the students' decision making as far as accepting and using VLEs are concerned. In this paper we are applying one of the most popular models, the so-called Unified Theory of Acceptance and Use of Technology (UTAUT) model developed by Venkatesh et al. (2003) to identify and test the underlying factors influencing VLE acceptance and use. UTAUT is a relatively new model sparsely applied in cross-cultural settings and in the context of Higher Education (Straub, 2009). We are testing the model in four business schools in universities in three different countries: the UK, Russia and Jordan. The results show that although all items from the original UTAUT questionnaire have their place in the final groupings obtained through the factor analysis, the 'clean' agglomeration of items into groups shown by the original paper and a few others could not be replicated in the individual countries or in the overall sample despite the good sample size obtained in our study. The paper raises a question about the replicability of the original results and calls for reconsideration of the way the model is applied.

Keywords: UTAUT, technology acceptance, virtual learning environments, higher education

1. Introduction

The aim of this study is an attempt to replicate the original results of Venkatesh et al. (Venkatesh et al., 2003) testing their UTAUT (Unified Theory of Acceptance and Use of Technology) model on a distinct type of technology – higher education virtual learning environments (VLEs) in different countries. Few studies have attempted to test the UTAUT model in other countries and most of them include the US where the model was originally developed and tested (e.g. Venkatesh and Zhang, 2010; Im et al. 2011; Nistor et al., 2010, 2011). Venkatesh and Zhang (2010) call for expanding the use of the model by primarily testing its validity and robustness in other cultural contexts. This paper aims to fill this gap and provide insights from three countries: the UK, Russia and Jordan. This paper advances the recent findings of Blagov and Bogolyubov (2013), where UTAUT has been tested in three Russian organisations from various industries which implemented corporate Web 2.0 platforms. The focus of this study differs in the sense that the samples we are comparing are significantly different in their geographical location and culture. Unlike in (Blagov and Bogolyubov, 2013), all respondents are business and management students, and so the demographic profile of these respondents is quite similar. Thus, any differences in the results can be theoretically attributed to the national differences only, which could presumably help us understand the UTAUT's applicability to cross-cultural studies. Furthermore, as Straub (2009) points out, UTAUT has not been extensively applied to VLEs, and the paper helps address this gap as well.

Virtual Learning Environments (VLEs) are digital platforms – often Web 2.0-driven – which aim at enhancing interactions, firstly, among the students, and secondly, between the students and the teachers within the environments of the educational institutions. These platforms are being given an increasingly prominent role in the teaching and learning process in the recent years (e.g. Pituch and Lee, 2006). The use of VLE provides access to a wealth of materials and allows interaction and knowledge sharing between the students and between the students and the teachers without space and time limitations of any kind (van Raaij and Schepers, 2008). Such Virtual Learning Environments as Moodle or Blackboard are tools for knowledge mapping where the students are provided with the course contents, lesson plans, podcasts, etc. In addition to that, the VLEs

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also serve for knowledge sharing and creation by using wikis, forums, resources and repositories embedded in them, with significant positive effects demonstrated by several studies (e.g. Eid and Nuhu, 2011, looking at Saudi Universities in particular). It is often argued that adoption of VLEs within universities could result in greater students' creativity, problem solving, and improvement of the students' learning experiences (e.g. Wozney et al., 2006). In order to maximize the use of the Virtual Learning Environments it is crucial to identify the factors that are important to students when they are making a decision of whether to use a VLE for a particular purpose or to prefer any alternative instruments for reaching this purpose.

In the following section we present the UTAUT theoretical model with a discussion of its current state and robustness. The subsequent sections portray our study design, analysis and findings. Finally, we conclude with theoretical and practical remarks and describe future opportunities for the research development.

2. Theoretical framework

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by (Venkatesh et al., 2003) as a meta-theory based on eight preceding models describing the user's acceptance of new technologies: namely, the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planned behaviour (TPB), the model of PC utilization (PCU), the innovation diffusion theory (IDT), and the social cognitive theory (SCT). The authors assessed the abovementioned eight models with regards to their similarities, differences and abilities to explain the individuals' new technologies acceptance. These eight models have been compared empirically in four US organisations; the results of this comparison had shown that the original eight models have explained between 17% and 53% of the variance in the respondents' use and acceptance of technology. Based on these results, Venkatesh et al. proposed a new unified model, the UTAUT. This resulting model appears to present a fairly complete picture of technology acceptance and use. The main part of this model is the list of presumed direct determinants of the behavioural intention to accept and use a new technology, and the subsequent use behaviours: nemaly, this list does include the performance expectancy, effort expectancy, social influence, and facilitating conditions. Four moderator variables presumably impacting the users' activity in use and acceptance of technology are also included into the model: namely, gender, age, experience of the user, and the voluntariness of use of the technology. Subsequently, Venkatesh et al. have tested the newly founded UTAUT model on four companies of different industries. This study has shown that the explanatory power of the UTAUT model is 70%, thus clearly exceeding the results obtained by the eight models it has originated from. The graphical representation of the UTAUT model is portrayed on Figure 1.

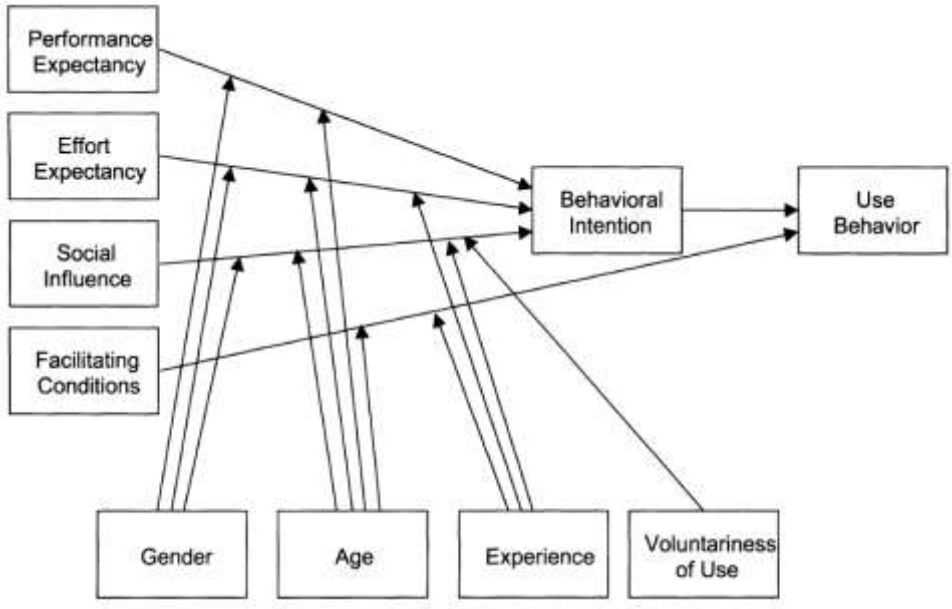

Figure 1: UTAUT Model (Venkatesh et al., 2003)

The original UTAUT model presented above has been cross-culturally tested in (Oshlyansky et al., 2007). In this study, the model has been tested with students from diverse faculties in the following nine countries: Czech Republic, Greece, India, Malaysia, New Zealand, Saudi Arabia, South Africa, the United Kingdom, and the

United States. The authors of the study have conducted Principal Component Analysis (PCA) on the data to explore and validate the factor loadings. Although most of the resulting loadings were impressively in line with (Venkatesh et al., 2003), all constructs except Anxiety also loaded on one single factor, that the authors called the 'omnibus'. The authors argue that this was a good result, since it distinguished the UTAUT part of the questionnaire used by them from the Hofstede-based questions, measuring the influence of the national culture. Based on this, they concluded that the UTAUT model is robust and applicable across diverse countries and cultures. We, however, would disagree with the interpretation of these results by Oshlyansky et al., and posit that these results, in fact, do exactly the opposite to what the authors claim, i.e., they make the UTAUT construct validity questionable. Indeed, the original UTAUT model suggests seven *distinct* determinants, while the results of Oshlyansky et al. results show that there is a significant amount of interaction between these determinants, thus clearly showing a contradiction with the original version of the UTAUT.

Venkatesh and Zhang (Venkatesh and Zhang, 2010) further tested the validity of the UTAUT model in diverse cultural settings and compared two countries: the US and the People's Republic of China. Their results revealed variations in the relationships across the countries based on gender, age and experience, as well as a significant difference on the effect of the Social Influence variable. They concluded that the UTAUT model has a potential to be extended cross-culturally. However, considering the scarcity of the empirical evidence, they called for further testing and validating of the model so that it acquires greater robustness and generalizability power. In an attempt to answer this call and enhance the theory, Blagov and Bogolyubov (2013) tested the validity of UTAUT in three Russian companies across diverse industries – namely, the software development industry, higher education (an University business school), and the banking industry. Following the methodology suggested in (Oshlyansky et al., 2007), they conducted the Principal Component Analysis and concluded that the model could be considered valid in the Russian context, although factor loadings were significantly different from those obtained by Venkatesh and by Oshlyansky et al.

As Blagov and Bogolyubov (2013) studied solely one country, we attempt to fill this gap and extend their study by comparing Russia, Jordan and the UK and focusing on the use and acceptance of VLEs within Universities' Business and Management Schools. Our research aims are, thus: 1) to cross-culturally validate the Unified Theory of Acceptance and Use of Technology model and 2) to test the model within a particular industry context of higher education. In the following section the methodology adopted for the study is presented.

3. Methodology

As it is evident from the literature review, there have been several recent attempts to test and validate the UTAUT model cross-culturally, as it has been contended by the originators of the model that a lack of cross-cultural grounding is a potential shortcoming of the original model that needs to be addressed by scholars. The question this research aims to answer is whether the original UTAUT model developed in the US can be extended to other countries. We first conduct analysis for all the countries together to make use of the larger sample and see if the results follow the findings of Venkatesh et al. in general. Then we conduct individual Principal Component Analysis for each country and analyse whether the results are significantly different from the original UTAUT model. Thirdly, we compare the results between the country samples to identify any similarities and differences between the countries. Subsequently, we try to explain any unexpected results and any emerging cultural differences.

The data was collected from the students in four Business and Management Schools; two of these in the UK (N=102), one in Russia (N=67) and one in Jordan (N=94). Prior to sending out the survey, the questions have been adjusted and reworded to fit the technology in question. In our case we are investigating the use of Moodle and Blackboard as learning platforms, so the questions had to reflect this. Subsequently, the construct "behavioural intention to use" was dropped from the model as we were testing the UTAUT model on already implemented technologies as opposed to predicting the use of technology that has not been implemented yet. The English version of the adapted questionnaire is presented in Appendix A. For usage in Russia and Jordan, the survey has been back-translated and administered in local languages. The survey was sent out to all the Business and Management students of the respective schools. In total 263 completed questionnaires were returned. Cronbach's alphas have been calculated; the acceptability threshold was assumed to be .70 (Nunnally, 1978). All constructs scored alphas between 0.790 and 0.914, which is well above the recommended threshold. The following table presents the reliability results for each construct (Table 1):

Table 1: Cronbach's Alphas, combined set

UTAUT Construct	Cronbach's Alpha
Performance expectancy	.876
Effort expectancy	.914
Attitude toward using technology	.877
Social influence	.812
Facilitating conditions	.790
Self-efficacy	.840
Anxiety	.833

We conducted the Principal Component Analysis with Varimax rotation using the SPSS 21 software to identify the factor loadings. The cut-off values for factor loadings have been taken from (Kline, 2002): eigenvalues of 0.1 or more have been considered acceptable principal components, and factor loadings with magnitude 0.3 or more have been considered to have significant impact on the factor.

Table 2: All countries results of the PCA after the Varimax rotation

	Component					
	1	2	3	4	5	6
PE1	.743*	.094	.001	-.012	-.334*	-.363*
PE2	.732*	.115	-.014	-.229	-.228	-.220
PE3	.749*	.116	-.030	-.326*	-.174	-.217
PE4	.649*	.107	-.289	-.280	-.106	-.205
EE1	.739*	-.106	.351*	.199	-.132	-.025
EE2	.741*	-.178	.347*	.263	.061	.044
EE3	.736*	-.240	.416*	.273	-.087	.015
EE4	.708*	-.209	.414*	.284	-.017	.022
ATUT1	.756*	-.080	.184	-.026	-.048	-.162
ATUT2	.637*	.076	.331*	-.499*	.172	.105
ATUT3	.606*	.069	.339*	-.540*	.146	.215
ATUT4	.759*	.046	.278	-.338*	.055	-.004
SI1	.657*	.199	-.222	-.149	.229	.054
SI2	.413*	.253	-.385*	.010	.290	.077
SI3	.691*	.154	-.278	.152	.145	-.334*
SI4	.702*	.137	-.258	.231	.171	-.324*
FC1	.635*	-.027	-.101	.256	.324	.048
FC2	.733*	-.128	.157	.259	.294	.081
FC3	.717*	.051	-.097	.138	.229	.080
FC4	.606*	.148	-.314*	-.049	.312*	.121
SE1	.629*	.059	-.134	.259	-.219	.184
SE2	.664*	.236	-.257	.079	-.270	.277
SE3	.681*	.124	-.194	.127	-.288	.380*

	Component					
	1	2	3	4	5	6
SE4	.613*	.134	-.307	-.011	-.354	.333*
Anx1	-.248	.623*	.145	.272	-.086	-.240
Anx2	-.195	.791*	.239	.066	.054	.070
Anx3	-.169	.841*	.234	.095	.033	-.006
Anx4	-.268	.758*	.291	.052	-.002	.094

4. Analysis and findings

The results of the Principal Component Analysis after Varimax rotation based on the whole dataset are presented in Tables 2, 3, 4 and 5. Each row corresponds to the respective question in the questionnaire which is provided in Appendix A. The significant loadings are marked with the sign "*" in the table.

Table 3: UK results of the PCA after the Varimax rotation

	Component						
	1	2	3	4	5	6	7
PE1	.781*	.224	.294	-.089	.084	-.069	.033
PE2	.825*	.221	.046	-.071	.100	.052	.105
PE3	.781*	.121	.130	.004	.061	.190	-.030
PE4	.752*	.055	.224	.016	.115	.050	.104
EE1	.333*	.824*	.088	-.058	.102	.136	.116
EE2	.206	.811*	.275	-.125	.178	-.042	.079
EE3	.159	.865*	.214	-.173	.055	.141	-.080
EE4	.189	.761*	.357*	-.251	.048	.144	-.139
ATUT1	.639*	.223	.391*	-.220	.122	.293	-.045
ATUT2	.596*	.017	.000	.178	.029	.629*	-.020
ATUT3	.543*	.119	-.017	.123	.096	.717*	-.029
ATUT4	.664*	.174	.022	.029	.180	.563*	-.074
SI1	.246	-.040	.195	-.003	.158	.095	.766*
SI2	-.100	.031	.061	.014	.046	-.003	.833*
SI3	.302*	.127	.748*	.015	.105	-.026	.200
SI4	.311*	.138	.780*	-.009	.095	-.106	.029
FC1	.081	.242	.814*	-.062	.145	.181	.125
FC2	.041	.365*	.764*	-.106	.122	.168	-.012
FC3	.230	.192	.403*	-.177	.302*	.274	.213
FC4	-.020	.327*	.336*	.009	-.018	.663*	.252
SE1	.036	.536*	.154	-.080	.416*	.140	.042
SE2	.112	.125	.258	.089	.820*	.051	-.014
SE3	.138	.154	.102	-.018	.852*	-.002	.120
SE4	.117	.064	.027	-.038	.892*	.039	.089

	Component						
	1	2	3	4	5	6	7
Anx1	-.037	.123	.115	.717*	-.186	.030	.005
Anx2	-.124	-.197	-.157	.820*	.060	.062	-.038
Anx3	.001	-.269	-.034	.862*	.055	.040	.002
Anx4	.073	-.166	-.121	.878*	.069	.004	.034

Table 4: Russia results of the PCA after the Varimax rotation

	Component						
	1	2	3	4	5	6	7
PE1	.329*	.703*	.454*	.103	.095	.096	.020
PE2	.607*	.544*	.022	.206	.399*	.096	-.094
PE3	.551*	.604*	.098	.215	.350*	.184	-.007
PE4	.357*	.670*	.254	.232	.316*	.072	.161
EE1	.452*	.203	.622*	.155	.282	.167	.018
EE2	.392*	.302*	.770*	.115	.148	.102	.087
EE3	.314*	.260	.754*	.226	.179	.224	-.060
EE4	.224	.224	.834*	.016	.017	.072	-.201
ATUT1	.704*	.434	.135	.077	-.082	.155	.027
ATUT2	.822*	.071	.332*	.279	.131	.046	.106
ATUT3	.805*	.113	.393*	.159	.128	.064	.198
ATUT4	.799*	.160	.284	.197	.028	.256	.083
SI1	.629*	.331*	.061	.289	.068	.337*	.379*
SI2	.231	.122	-.061	.187	.202	.090	.795*
SI3	.370*	.763*	.159	.105	.123	.170	.020
SI4	-.088	.797*	.288	.141	.062	.099	.182
FC1	.415*	.206	.114	-.152	.217	.605*	.315
FC2	.201	.114	.431	-.113	.097	.649*	.284
FC3	.050	.023	.198	.425*	.084	.731*	.022
FC4	.170	.181	.070	.089	.168	.821*	-.094
SE1	-.071	.103	.602*	.048	.312*	.328*	.319*
SE2	.058	.199	.241	.219	.805*	.189	-.082
SE3	.131	.061	.112	.198	.878*	.098	.178
SE4	.071	.170	.131	.233	.810*	.134	.197
Anx1	-.430*	-.007	-.120	-.642*	-.227	-.273	.164
Anx2	-.172	-.169	-.027	-.857*	-.255	-.025	-.210
Anx3	-.201	-.210	-.078	-.799*	-.294	.073	-.303*
Anx4	-.234	-.360*	-.277	-.661*	-.171	-.256	.143

Table 5: Jordan results of the PCA after the Varimax rotation

	Component							
	1	2	3	4	5	6	7	8
PE1	.397*	.057	.121	.683*	.104	.303*	-.021	-.206
PE2	.284	.161	-.004	.806*	.102	.104	.161	.165
PE3	.173	.031	.284	.770*	.294	.145	-.063	.080
PE4	-.092	.051	-.043	.155	.704*	.178	.302*	-.169
EE1	.683*	-.013	.270	.270	.116	.303*	-.280	.110
EE2	.796*	-.064	.058	.235	.041	.031	.123	.286
EE3	.880*	-.091	.138	.175	.117	.154	-.050	.008
EE4	.869*	-.056	.046	.198	.042	.063	.183	.065
ATUT1	.602*	-.131	.265	.151	.238	.367	.010	-.053
ATUT2	.418*	.004	.231	.132	.731*	.050	.024	.215
ATUT3	.346*	-.066	.051	.427*	.541*	-.072	.312*	.238
ATUT4	.495*	-.024	.279	.193	.650*	.139	-.061	.083
SI1	.281	.219	.335*	.349*	.177	-.039	.355*	.215
SI2	-.133	.246	.645*	.259	-.024	.178	.142	.255
SI3	.278	.038	.823*	.192	.025	-.043	.214	-.083
SI4	.274	.035	.824*	-.058	.240	.196	.045	.067
FC1	.293	-.079	.082	.094	.014	.198	.060	.760*
FC2	.702*	-.117	.062	.041	.298	.045	.165	.393*
FC3	.420*	.134	.346*	.069	.253	.117	.087	.445*
FC4	-.002	-.005	.219	-.018	.153	.036	.843*	.130
SE1	.179	.052	.051	.144	.100	.788*	-.053	.229
SE2	.167	.158	.071	.330	.054	.585*	.405*	.037
SE3	.423*	.071	.333*	.061	.189	.546*	.110	.009
SE4	.348*	.164	.152	.208	.218	.236	.480*	-.308*
Anx1	-.176	.650*	.078	-.028	-.143	.332*	.050	-.192
Anx2	-.055	.822*	-.031	.099	.085	-.079	.051	.046
Anx3	.011	.859*	.199	.003	.073	.058	.065	-.174
Anx4	-.052	.837*	.022	.101	-.049	.012	-.050	.160

The summary of all loadings by sample are represented in Table 6.

The table allows us to carry out an overall comparison between the results per dataset, and perhaps even more importantly, to compare them with the theory.

The theory predicts, and the research papers discussed earlier show, that the questionnaire items should fall neatly into seven factors, all referring to the different constructs of the UTAUT model.

It is evident from the tables presented above that the results exhibited in the four datasets differ from the ideal picture quite a lot. The combined set results in six factors; the UK and Russian sets result in seven; finally, the Jordanian set exhibits eight factors. However, even in the results with seven distinct factors, that can be comparatively called "the ideal scenario", the constructs do not load solely onto one factor. Apart from Anxiety, almost none of the factors load "cleanly" – i.e., all four items of the construct, and nothing but these four items. Across the sets, some items can load onto as many as three different factors, and each factor is represented by a mix of elements from different constructs, which challenges the model's construct validity, as does the fact that the number of the factors is varying from six to eight. The presence of the "omnibus" factor in the combined set goes against its discriminant validity: this factor can only be described as the "general attitude factor", i.e., whether respondents feel vaguely good about the system, which is supported by the fact that Anxiety is not part of it. The latter construct is an interesting item on its own right: it is the only construct that behaves according to the UTAUT model predictions at least sometimes. Even at that, however, it is inconsistent: all the Anxiety factor items load negatively in Russia, but positively everywhere else (including the results from other research – e.g., (Oshlyansky et al., 2007) and (Simeonova et al., 2013)). Moreover, the Russian University results are different - in a similar way – from a larger dataset analysed in (Blagov and Bogolyubov, 2013)). Following the scattered picture presented above, it is very difficult to make any inferences about any underlying factors influencing the adoption of VLEs in the respected institutions and to further elaborate on any similarities and differences based on cultural characteristics. As presented the only "clean" factor is in the Anxiety construct, but the results appear to be quite controversial and not uniform, thus we cannot draw any conclusions regarding the use of VLE and the corresponding Anxiety levels in the three different countries.

Table 6: Summary of the PCA results

		Factor							
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Sample	**Combined**	All but Anx	All Anx (pos)	All EE, ATUT2, and 3, SI2, FC4	PE3, ATUT2, 3 and 4	PE1, FC4	PE1, SI 2 and 3, SE 3 and 4		
	UK	All PE, EE1, all ATUT, SI 3 and 4	All EE, FC 2 and 4, SE1	EE4, ATUT1, SI 3 and 4, all FC	All Anx (pos)	FC3, all SE	ATUT 2, 3 and 4, FC4	SI 1 and 2	
	Rus (HE)	All PE, EE 1, 2 and 3, all ATUT, SI 1 and 3, FC1, Anx 1 (neg)	All PE, EE2, SI 1, 3 and 4, Anx 4 (neg)	PE1, all EE, ATUT 2 and 3, SE1	FC3, all Anx (neg)	PE 2, 3 and 4, all SE	SI1, all FC	SI 1 and 2, SE1, Anx 3(neg)	
	Jordan	PE1, all ATUT, FC 2 and 3, SE 3 and 4	All Anx (pos)	All SI, FC3, SE3	PE1, 2 and 3, ATUT3, SI1	PE4, ATUT 2, 3 and 4	PE1, EE1, SE 1, 2 and 3, Anx 1	PE4, ATUT3, SI1, FC4, SE2 and 4	FC1, 2 and 3, SE4

Although it *might* be possible to make sense out of the particular combination of items as we have, indeed, already tried in (Blagov and Bogolyubov, 2013) and (Simeonova et al., 2013), the fact that explanations would have to be different between sets in the same industry and in the same country, challenges the reliability of the Unified Theory of Acceptance and Use of Technology model, and there are only so many unique explanations one would be prepared to go into before arriving at conclusions concerning the theory's generalizability.

5. Conclusion

Our research attempted to cross-culturally replicate and validate the original Unified Theory of Acceptance and Use of Technology (UTAUT) model and its developments, as well as to test the UTAUT model within the higher education settings.

The only conclusion that the resulting evidence allows us to make is that so far we could not replicate the results of (Venkatesh et al., 2003) regarding the validity and reliability of the UTAUT model despite using the original instrument and the appropriate rigour in data gathering and analysis. All sets of factor loadings resulting from the Principal Component Analysis differ from one another within organizational and/or technological environments, as well as within countries, and due to that, none of the deviations from the

predictions of the original UTAUT model could be attributed to occupational, technological or national differences. In fact, the scale's reliability has proven to be so low that the groupings appear to be almost random.

There is not enough evidence to make any conclusions regarding the reasons for such wide discrepancies between the Unified Theory of Acceptance and Use of Technology and some of its applications on one hand, and our results on the other. We would suggest that a further study of the UTAUT model's reliability and different aspects of its validity could shed some further light on the matter.

Appendix A

The UTAUT questionnaire leveraged to the sample countries' respective languages (Russian and Arabic) is presented below:

Performance Expectancy: How useful do you think Moodle/Blackboard is?

PE1 I would find Moodle/Blackboard useful for my studies

PE2 Using Moodle/Blackboard enables me to accomplish tasks more quickly

PE3 Using Moodle/Blackboard increases my productivity

PE4 If I use Moodle/Blackboard, I will increase my chances of successfully completing the course

Effort Expectancy: How much effort does it take?

EE1 My interaction with Moodle/Blackboard would be clear and understandable

EE2 It would be easy for me to become skilful at using Moodle/Blackboard

EE3 I would find Moodle/Blackboard easy to use

EE4 Learning to operate Moodle/Blackboard is easy for me

Attitude toward using technology: Is it enjoyable?

ATUT1 Using Moodle/Blackboard is a good idea

ATUT2 Moodle/Blackboard makes work more interesting

ATUT3 Working with Moodle/Blackboard is fun

ATUT4 I like working with Moodle/Blackboard

Social Influence: What do your social surroundings think about Moodle/Blackboard?

SI1 People who influence my behaviour think I should use Moodle/Blackboard

SI2 I use it because most of my classmates do

SI3 The teachers are supporting the use of Moodle/Blackboard

SI4 In general, the University supports the use of Moodle/Blackboard

Facilitating Conditions: Do you have everything you need to use Moodle/Blackboard?

FC1 I have the resources necessary to use Moodle/Blackboard

FC2 I have the knowledge necessary to use Moodle/Blackboard

FC3 Moodle/Blackboard is compatible with other systems I use

FC4 A specific person (or group) is available for assistance with Moodle/Blackboard difficulties

Self-efficacy: I could complete a job or task using Moodle/Blackboard…

SE1 If there was no one around to tell me what to do as I go

SE2 If I could call someone for help if I got stuck

SE3 If I had a lot of time to complete the job for which the software was provided

SE4 If I had just the built-in help facility for assistance

Anxiety: Are there any concerns?

Anx1 I feel apprehensive about using Moodle/Blackboard

Anx2 It scares me to think that I could lose a lot of information using Moodle/Blackboard by hitting the wrong key

Anx3 I hesitate to use Moodle/Blackboard for fear of making mistakes

Anx4 Moodle/Blackboard is somewhat intimidating to me

References

Al-Gahtani, S. S., Hubona, G. S. and Wang, J. (2007) 'Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT', *Information & Management*, vol. 44, pp. 681-691.

Blagov, E. and Bogolyubov, P. (2013) 'Corporate Web 2.0 systems adoption in Russian companies: testing the UTAUT validity' In: Abstracts of Papers Presented at the International Conference on Innovation and Entrepreneurship. Kharabsheh, R A. (ed.). Reading : Academic Conferences and Publishing International Limited p. 4-5. 2 p.

Eid, M. and Nuhu, N. A. (2011) 'Impact of learning culture and information technology use on knowledge sharing of Saudi students', *Knowledge Management Research & Practice*, vol. 9, pp. 48-57.

Hofstede G. and Bond M. H. (1988) 'The Confucius Connection: From Cultural Roots to Economic', *Organizational Dynamics*. Vol. 16, no. 4, pp. 4–21.

Im, I., Hong, S. and Kang, M. S. (2011) 'An international comparison of technology adoption', *Information & Management*, vol. 48, pp. 1-8.

Kline, P. (2002) *An Easy Guide to Factor Analysis*, Routledge, New York.

Nistor, N., Wagner, M., Istvanffy, E., Dragotă, M. (2010) 'The Unified Theory of Acceptance and Use of Technology: Verifying the model from a European perspective', *International Journal of Knowledge and Learning,* 6, pp. 185–199

Nistor, N., Weinberger, A., Ceobanu, C. & Heymann, J. O. (2011) Educational Technology and Culture: The Influence of Ethnic and Professional Culture on Learners' Technology Acceptance. Berlin, Heidelberg: Springer Berlin Heidelberg.

Nunnally, J. C. (1978) *Psychometric theory (2nd ed.),* New York: McGraw–Hill.

Oshlyansky, L., Cairns, P. and Thimbleby, H. (2007) 'Validating the Unified Theory of Acceptance and Use of Technology (UTAUT) tool cross-culturally', Proceedings of the 21st British HCI Group Annual Conference on People and Computers. British Computer Society, pp. 83-86.

Pituch, K. A. and Lee, Y.-K. (2006) 'The influence of system characteristics on e-learning use', *Computers & Education*, vol. 47, pp. 222-244.

Simeonova, B., Bogolyubov, P. and Blagov, E. (2013) 'Use and acceptance of learning platforms within universities'. in Janiūnaitė, B., Pundziene, A. and Petraite, M. (eds), *Proceedings of The 14th European Conference on Knowledge Management held at the Kaunas University of Technology Kaunas, Lithuania 5-6 September 2013.* pp. 642-651, 14th European Conference on Knowledge Management , Kaunas, Lithuania, 5-6 September.

Straub, E. T. (2009) 'Understanding Technology Adoption: Theory and Future Directions for Informal Learning', *Review of Educational Research*, vol. 79, pp. 625-649.

The Hofstede Centre. (2013) 'What about Russia', [online], http://geert-hofstede.com/russia.html

Van Raaij, E. M. and Schepers, J. J. L. (2008) 'The acceptance and use of a virtual learning environment in China', *Computers & Education*, vol. 50, pp. 838-852.

Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D. (2003) 'User Acceptance of Information Technology: Toward a Unified View', *MIS Quarterly*, vol. 27, pp. 425-478.

Venkatesh, V. and Zhang, X. (2010) 'Unified Theory of Acceptance and Use of Technology: U.S. Vs. China', *Journal of Global Information Technology Management*, vol. 13, no. 5.

Vitari, C., Moro, J., Ravarini, A. and Bourdon, I. (2007) 'Improving KMS Acceptance: The Role Of Organizational And Individuals' Influence', *International Journal of Knowledge Management,* 3, pp. 68-90.

Vrasidas, C. (2004). 'Issues of pedagogy and design in e-learning systems', *Proceedings of the 2004 ACM symposium on Applied computing*, March 14-17, 2004, Nicosia, Cyprus

Wozney, L., Venkatesh, V. and Abrami, P. (2006) 'Implementing Computer Technologies: Teachers' Perceptions and Practices', *Journal of Technology and Teacher Education*, 14, pp. 173-207.