EXPLORING THE FACTORS INFLUENCING E-LEARNING OF TURKISH EFL LEARNERS THROUGH TAM

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ABSTRACT

The purpose of this study was to understand the attitude of Turkish EFL learners towards technology and to determine the factors influencing the academic achievement of the learners while using technology. Survey method was used to collect data about technology acceptance of the Turkish Foreign Language Learners. This research was conducted at a state-run university in 2012-2013 academic year and subjects were 231 male and 279 female e-language learners from the Vocational Higher School taking up English course through e-learning. According to the results of the research, some of the TAM factors had effects on the academic achievement of the e-learners. It was revealed that while anxiety towards e-learning had a negative effect on academic achievement; perceived ease of use, attitude, satisfaction and self-efficacy had a positive effect on the academic achievement of e-learners. These findings indicated that Turkish EFL learners had a positive attitude towards technology in education.

Keywords: Technology Acceptance Model, e-learning, English Foreign Language, Achievement

INTRODUCTION

While Prensky (2001) names today's students as digital natives, Tapscott (1998) calls them net generation. Because they are born in a different world which is full of digital technology and this technology is an important part of their lives. Prensky (2001) states that the new generation is exposed to a huge amount of information since early childhood and therefore they think and process information much faster and are used to multi-tasking. However, they have little patience for long tasks and get bored easily. Therefore, it is vital for teachers to make a shift in methodology and learning content.

It has been proved that information and communication technologies encourage learners to make progress in their foreign language learning and motivate the learners in a positive and creative manner (Sanders & Morrison-Shetlar, 2001). Sankaran and Bui (2000) found that students who preferred courses supported with technology performed better than those who were presented in the lecture format.

However, Huang and Liaw (2005) state that, no matter how sophisticated and powerful the state of technology is, it is the user having a positive attitude towards it. Therefore, it is the purpose of this study to determine the attitude of Turkish EFL learners towards e-learning through Technology Acceptance Model (TAM) and to investigate the factors influencing academic achievement of Turkish EFL learners from technological point of view.

TECHNOLOGY ACCEPTANCE MODEL (TAM)

Technology Acceptance Model (TAM) (Davis, 1989) generated from the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) offers a theoretical basis for user acceptance and usage behavior of information technology. Figure 1 illustrates Technology Acceptance Model.
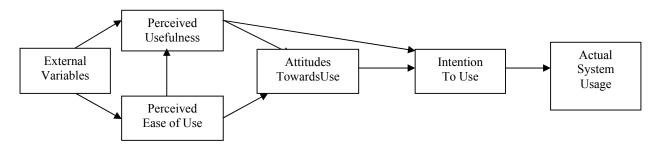
Figure 1: Technology Acceptance Model (Davis, 1989)

In TAM, there are two core beliefs as perceived usefulness and perceived ease of use which lead an individual's behavioral intention to adopt a system. Davis (1989) defines Perceived usefulness as "the degree to which an individual believes that using a particular system would enhance his or her productivity" while perceived ease of use is defined as " the degree an individual believes that using a particular system would be free of effort" (Davis, 1989). It can be stated that perceived ease of use has a direct effect on both perceived usefulness and technology usage (Adams, Nelson& Todd; 1992; Davis, 1989). Davis (1989) cites that users' beliefs are directly related to a technology's usefulness, the attitude and the intention to use the technology. It is reported that perceived usefulness has stronger relationship with usage than other variables. Moreover, an individual adopts a technology if it is considered as convenient, useful and socially desirable even though it is not enjoyable to use the technology (Saga & Zmud, 1994).

TAM is a model widely used in the studies about the acceptance of technology. This model has been adopted and expanded in many studies in various types of technologies including e-mail, word processor, World Wide Web, enterprise resources planning (ERP) systems and proved high validity.

REVIEW OF LITERATURE
Rogers (1995) states in his Innovation Decision Process theory that an innovation's acceptance is realized over time through five stages: Knowledge, Persuasion, Decision, Implementation and Confirmation. Accordingly, ''the innovation-decision process is the process through which an individual passes (1) from first knowledge of an innovation, (2) to forming an attitude toward the innovation, (3) to a decision to adopt or reject, (4) to implementation of the new idea, and (5) to confirmation of this decision'' (Rogers, 1995). In cases where technology is recently introduced into a system, the knowledge of an innovation and attitudes about it is the main focus of attention (Akbulut, 2008).

The early studies on attitudes to computer technology generally revealed that existing culture, interaction with the tutors and dialogue were the predictors of success in distance learning. Moreover, researches suggested that there was no significant difference in achievement levels between distant and traditional learners (Golonka, Bowles, Frank, Richardson & Freynik, 2014; Larson & Sung, 2009; Koçoğlu, Ozek & Kesli, 2011)

Thomas (1987) emphasizes the importance of the cultural/social norms of a country to the acceptance of technology. Thomas states, ''How acceptable a new technology will be in a society depends on how well the proposed innovation fits the existing culture'' (p.15). A user may resist a technological innovation because it may not fit within their micro- or macro-cultures. Thomas names his hypothesis as "the cultural suitability factor".As Stone (1990) argues in his assessment of interactivity in distance learning, high quality learning can occur as long as students have interaction with tutors.

Johnstone (1991) stated that there was no significant difference between distant and traditional learners in terms of achievement, but student attitudes and satisfaction levels varied considerably. According to Kirkup and Jones (1996) the success of distance learning courses cannot be predicted. They summarized the most significant disadvantages of distance education as (a) the lack of dialogue; (b) the inflexibility of its content and methodology; and (c) the isolation and individualization of the student.
Hilgenberg and Tolone (2000) maintained that the limitation of dialogue between teachers and learners, and amongst learners themselves was the most important shortcomings of many distance learning courses.

Khine (2001) corroborated with Yuen and Ma (2001) revealed that affective attitudes, general usefulness, behavioral control, and pedagogical use were significant in determining the use of ICT. Kumar and Kumar (2003) reported that the amount of computer experience had a positive effect on attitude towards computers.

Glancing at the recent literature on technology acceptance and e-learning especially through TAM, Lee, Yoon and Lee (2009) investigated critical factors on e-learning adoption in South Korea and their study proposed a research model with four independent variables as instructor characteristics, teaching materials, design of learning contents, and playfulness.

In his study, Lee (2010) combined the expectation–confirmation model (ECM), the technology acceptance model (TAM) and the theory of planned behavior (TPB) to propose a theoretical model to predict the users' intentions to continue using e-learning. The results suggested that satisfaction played the most important role on users' continuance intention, followed by perceived usefulness, attitude, concentration and subjective norm.

Sang, Valcke, van Braak, and Tondeur (2010) focused on the impact of Chinese student teachers' gender, constructivist teaching beliefs, teaching self-efficacy, computer self-efficacy, and computer attitudes on their prospective Internet and Computer Technology (ICT) use. Results indicated that prospective ICT integration was significantly related to all teacher related variables, except for gender. Tzeng (2011) investigated users' perceptions of the technology and the perceptions' association with attitude towards and intention of using the technology. The results proved that for prospective users, attitudes had the strongest significant effect on usage intentions.

Cheung and Vogel (2013) used the technology acceptance model to highlight the factors that influence the acceptance of Google Applications for collaborative learning. According to the research results, the subjective norm represented by peers significantly moderates the relationship between attitude and intention toward the technology. Padilla-Meléndez et al (2013) examined the perceived playfulness in the context of a blended learning setting with existing gender differences. The study suggested that gender differences were effective on playfulness in the student attitude toward a technology and the intention to use it.

Although many publications are available on the topic of technology use in FL learning and teaching, the role of academic achievement with regard to TAM has rarely been discussed. Golonka, Bowles, Frank, Richardson and Freynik, (2014) points out that the influence of technology on foreign language learning has been great because of the studies on automatic speech recognition (ASR).

Reviewing the current literature in TAM, perceived ease of use and perceived usefulness were the key factors in the use of technology. Apart from others, this study focuses on to what extent other factors, besides these two, influence students' achievement in using the technology.

METHOD OF THE STUDY
In this research, survey method was used to collect data about technology acceptance of the Turkish Foreign Language Learners. There have been several studies focusing on TAM in various fields so far but little attention has been paid to understanding the perceptions of Turkish Foreign Language Learners through TAM in Turkish Vocational Higher education context. This study can be considered unique, because the effects of subfactors of TAM in academic achievement are also discussed. Therefore, the results and the implications of this study will highlight a different aspect of e-learning regarding a different population.

This study will answer the following research questions:
      1. Is there a correlation between students' achievement and variables in TAM?
      2. To what extent do the variables in TAM influence the academic achievement of students in online English learning?

SUBJECTS
This research was conducted at a state-run university in 2012-2013 academic year and subjects were 231 male and 279 female e-language learners from the Vocational Higher School taking up English course through e-learning. The subjects were elected on voluntary basis and the total number was 510. The participants study English course 2 credits a week. E-learners benefit from videos, notes, files etc. prepared by language teachers in an e-learning context. Videos that are composed of 15-20 minute presentations, a discussion board which learners ask questions at any time and e-content which is supported by animations are the main characteristics of the existing e-learning program. E-learning system is at students' disposal for 24 hours.

INSTRUMENT
Recent studies and researches on TAM were reviewed and items which represented the characteristics of this study were elaborated and adopted from these studies. The scale which was composed of 34 items had the following sub factors: Anxiety (4 items), Perceived ease of use (3 items), perceived usefulness (3 items),

Attitude (5 items), Subjective norms (3 items), Perceived Behavioral control (3 items), Satisfaction (3 items), Continuance intention (3 items), Self efficacy (4 items), Facilitating Conditions (3 items). The scales were adopted from the following studies: Anxiety scale from Venkatesh (2000) and Venkatesh et al. (2003), Perceived ease of use and perceived usefulness from Davis (1989), Attitude scale from Davis (1989) and Moon and Kim (2001), Subjective norm scale from Taylor and Todd (1995), Perceived Behavioral control from Taylor and Todd (1995) and Lee (2010), Satisfaction from Bhattacherjee, (2001) and Lee (2010), Continuance intention from Lee (2010), Self efficacy from Hua, Clark and Ma, (2003) and Facilitating Conditions from Cheung and Vogel (2013).

Five point likert scale ranging from strongly agree to strongly disagree was used in the study. The pilot study of the scale was conducted on 129 students and Cronbach alpha reliability coefficient for each factor was over 0,70. The total reliability coefficient was 0,89. Then factor analysis was done to determine whether expected number of factors was present and each item was loaded in expected factor. According to the results of factor analysis, high factor loadings of all items were accumulated in its own factor and low cross loadings were displayed in other factors.

FINDINGS
The scale was administered to 565 students taking English course online. Incomplete scales and the scales with invalid markings were eliminated and finally, 510 valid markings were obtained. The demographic data of the participants were presented in the following table.

Table 1. Demographic data of the participants

		F	**%**
Gender	Female	279	54,7
	Male	231	45,3
Facebook	Yes	468	91,8
	No	42	8,2
Personal Computer	Yes	391	76,7
	No	119	23,3
The skill of using technology	Insufficient	0	0
	Not bad	129	25,3
	Sufficient	251	49,2
	Very good	130	25,5
Daily internet usage	1-3 hours	168	32,9
	4-6 hours	239	46,9
	More than 6 hours	102	20,2
Documents which are used in the system by students	rarely	114	22,4
	sometimes	159	31,2
	frequently	186	36,5
	very often	51	10,0
Videos are used in the system by students	rarely	113	22,3
	sometimes	194	38,3
	frequently	175	34,5
	very often	25	4,9
Exercises are used in the system by students	rarely	87	17,3
	sometimes	255	50,7
	frequently	120	23,9
	very often	41	8,2

According to the demographic data collected, each participant (N= 468, 92%) almost had a facebook. Nearly 77% (N=391) of the subjects had personal computers. While 130 (%25,5) subjects' skill of using technology was very well, 251 of them had a sufficient skill of using technology. Inaddition, %20,2 (N=102) of the participants used internet more than 6 hours a day. Analyzing the use of e-learning materials by language learners, course documents, videos, and exercises were the most frequently used ones. While 186 participants used course documents frequently, 174 used course videos at thesame rate. Furthermore, 120 of the participants studied the exercises frequently. On the other hand, very few participants stated that they took advantage of form

pages. While 42 students used the form page for technical reasons frequently, 54 subjects used foreign language course form pageat a high rate. Moreover, voice files and messages were used at a low rate.

Table 2. The Analysis of subfactors in TAM

	N	Mean	Std. Deviation
Anxiety	510	2,66	1,01
Perceived usefulness	510	3,22	,70
Perceived ease of use	510	3,43	,75
Attitude	510	3,13	,68
Subjective norms	509	3,30	,72
Perceived behaviour control	510	3,40	,67
Satisfaction	510	3,27	,69
Continued intention	510	3,02	,80
Self-efficacy	510	3,51	,81
Facilitative conditions	510	3,82	,76

Analyzing the subfactors, the mean of anxiety level to the e-learning was 2,67 out of 5. It was understood that participants had somewhat anxiety to the system though it was not high. In addition, among the subfactors, facilitative conditions had the highest mean (X= 3,83). Also, it can be stated that themean of self-efficacy of the participants wastheothersubfactorwhich had a highmean (X=3,52). Themean of attitude of the participants to the system was 3,14.

Table 3. The Correlation among the variables

	2	3	4	5	6	7	8	9	10	11
1. Achievements	-,540*	,188	,696*	,552*	,163	,404*	,133	,184	,539*	,115
2. Anxiety		,123	-,304	-,162	,047	-,170	,029	,124	-,195	,025
3. Perceived usefulness			,346	,489	,394	,416	,443	,392	,312	,104
4. Perceived ease of use				,302	,226	,251	,277	,250	,473	,111
5. Attitude					,353	,225	,374	,351	,209	,104
6. Subjective norms						,348	,231	,203	,275	,035
7. Perceived behavior control							,243	,341	,228	,118
8. Satisfaction								,306	,205	,105
9. Continued intention									,365	,146
10. Self-efficacy										,285
11. Facilitative conditions										1

Table 3 shows the correlation among the variables. According to the table, there was a correlation between variables and achievements. Results of multiple regression analysis of achievements related to the predictions of the subfactors in TAM were presented in the following table.

Table 4. The Results of multiple regression analysis of achievements related to the predictions of the subfactors in TAM

	Beta	Std. Err.	Beta	t	P	Zero-order r	Partial r
Constant	20,897	3,776		5,534	,000		
Anxiety	-5,410	,484	-,310	-11,171	,000	-,540	-,448
Perceived usefulness	-1,804	,869	-,072	-2,076	,048	,188	-,093
Perceived ease of use	9,341	,757	,399	12,344	,000	,696	,484
Attitude	7,300	,849	,285	8,597	,000	,552	,360
Subjective norms	-,842	,827	-,034	-1,018	,309	,163	-,046
Perceived behavior control	1,342	,835	,052	1,607	,109	,404	,072
Satisfaction	2,296	,763	-,090	-3,008	,003	,133	,124
Continued intention	-,192	,699	-,009	-,274	,784	,184	-,012
Self-efficacy	4,407	,678	,203	6,502	,000	,539	,280
Facilitative conditions	,105	,600	,005	,174	,862	,115	,008

R = 0,837	R^2= 0,694
F(10,497) = 115,84	p= 0,00

Analyzing the zero-order and partial correlation between TAM subfactors and dependent variable (academic achievement), negative high correlation (r= -0,54, partial r = -0,45) was noticed between anxiety factor and academic achievement. However, positive correlation was observed between academic achievement and perceived ease of use (r= 0,696, partial r = 0,484), attitude (r= 0,552, partial r = 0,36), satisfaction (r= 0,133, partial r = 0,124) and self-efficacy (r= 0,539, partial r = 0,28). As of the other variables (perceived usefulness, subjective norms, facilitative conditions, continued intention, perceived behavior control), there was a low level correlation between these variables and academic achievement.

All variables predicted 70% of total variations in academic achievement (R = 0,837, R^2= 0,694, p= 0,00). Analyzing the results of t-test related to the significance of regression coefficient; anxiety, perceived ease of use, attitude, satisfaction and self-efficacy factors were the predictors of academic achievement. However, other subfactors (perceived usefulness, subjective norms, facilitative conditions, continued intention, perceived behavior control) did not have significant effect on academic achievement.

DISCUSSION
This is a study aiming to understand the attitude of Turkish EFL learners towards technology and to determine role of these factors in the academic achievement of the participants. According to the results of the research, most of the participants have a facebook account and a personal computer. In addition, each participant goes online every day and spends at least 1-5 hours online. Moreover, e-language learners spend most of the time studying course documents.

This result shows that, participant use technology in their daily life regularly. This finding is in consistent with the current literature. Junco (2012) investigated the use of facebook by 2359 university students and revealed that each student spent nearly 1 hour and 40 minutes on the Facebook a day.

The present study also reveals that some of the TAM factors have effects on the academic achievement of the e-learners. It is understood that while anxiety towards e-learning has a negative effect on academic achievement; perceived ease of use, attitude, satisfaction and self-efficacy have a positive effect on the academic achievement of e-learners. These findings indicate that Turkish EFL learners can be considered at the third phase of Roger (1995) Innovation Decision Process theory. In other words, participants have a positive attitude towards technology and they are at the stage to make a decision to adopt or reject the technology.

Golonka et al (2014) investigated 350 studies related to technology and foreign language learning and pointed out that technology helped to improve learners' output and interaction, affect and motivation, feedback, and metalinguistic knowledge. Moreover, Sathe and Waltje (2008) support this finding that students are motivated to spend more time on learning activities with technology. On the other hand, Lee's findings (2010) were partly in line with the results of the present study. His study revealed that satisfaction had the most significant effect on users' continuance intention, followed by perceived usefulness, attitude, concentration, subjective norm. However, perceived behavior control was found as significant but weaker predictors.

In accordance with results of the present study, Sang et al (2010) also found that computer self-efficacy and more favorable attitudes toward computer were the strongest predictor of prospective computer use. The results of Tzeng's (2011) research were in consistent with the findings of the present study. His study also indicated that attitudes had the strongest significant effect on usage intentions. Orr (2008) stated that the IWB wholly changed the classroom atmosphere. In addition, it increased students' enthusiasm, interest, and engagement in the learning process (Tozcu, 2008), and attracted attention (Schmid, 2007).

Results demonstrate that virtual worlds could be a good resource to decrease student anxiety and increase their motivation to learn a foreign language. On the other hand, the findings of this study were not in line with some studies, for example Saade and Kira's research (2007) revealed that anxiety did not play a mediating role on the impact of computer experience and perceived ease of use. Ngai, Poon and Chan findings (2007) were partly in accordance with the results of the present study. They found that perceived ease of use and usefulness were the significant factors influencing the attitude of students using WebCT. Moreover, in the literature there are several studies supporting the results of this study implying that using technology on language learning influences students' learning (Rybak, 1984;Alastuey, 2011;Zhao, 2013;Huang, 2013;Oberg & Daniels, 2013; Wu, Lin &

Yang, 2013; O'Brien & Levy, 2008; Sykes, 2008; Shih & Yang, 2008; Sanprasert; 2009; Hoshi, 2002). For example, Oberg & Daniels (2013) compared a self-paced instructional method based on the use of Apple's iPod Touch personal mobile devices and a group-oriented instructional method of content delivery on one hundred and twenty-two first-year Japanese university students. The results indicated a significant difference between the groups on behalf of the self-study iPod Touch-based instructional method. Moreover, Alastuey (2011) investigated the advantages and disadvantages of synchronous voice-based computer-mediated communication (CMC) in a blended course of English for specific purposes. Oral tasks were carried out face-to-face with the participants in the control group and through synchronous voice-based CMC in the experimental group. According to the results of the study, achievements were significantly better in the experimental group.

Wu et al (2013) explored effects of two types of e-tutoring applications that is,text-based vs. face-to-face videoconferencing, on the grammar performance and motivation of low-achieving students. The findings suggested that although the two modes of tutoring were equally effective, the Face to face group members got rid of their negative feelings toward English to a greater extent than the text-based group members. In addition, face to face students' self-improvement in their English performance was higher and they were more likely to evaluate the tutors and the e-tutoring program positively than the TB group.

CONCLUSION
In conclusion, activities should be arranged to reduce the anxiety of online English learners because there is a negative correlation between anxiety sub factor and the academic achievement.Primarily, materials prepared should be designed to attract students' interest.
While designing materials, ease of use factor should be taken into consideration, so that students can easily use the program.

Secondly, activities and presentations should be done to introduce the program to the students via help menu and other facilities such as ease of use influence the achievement of students in online learning. In addition, explanations and clues should be given when they encounter any troubles using of the program via orientation activities (Yukselturk & Bulut, 2007). Since students' attitudes and satisfaction are the factors affecting the achievement, some researches prove that keeping the students' motivation high helps to reach higher achievement in online learning (Yukselturk & Bulut, 2007). Furthermore, intentions and continuity of the students can be followed by supervising the students and providing feedback when necessary. Moreover,as an implication for further studies, interviewing with students can provide more reliable data about online foreign language learning.

REFERENCES

Adams, D. A., Nelson, R. R. & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: A replication, *MIS Quarterly 16* (2), 227–247
Akbulut, Y. (2008). Exploration of the attitudes of freshman foreign language students toward
using computers at a Turkish state university. *The Turkish Online Journal of Educational Technology, 7*(1). 18-31
Alastuey, M.C. B. (2011). Perceived benefits and drawbacks of synchronous voice-based computer-mediated communication in the foreign language classroom.*Computer Assisted Language Learning ,24*(5) 419-432
Bhattacherjee, A. (2001). An empirical analysis of the antecedents of electronic commerce   service continuance.*Decision Support Systems,* 32(2), 201–214.
Cheung, R. & Vogel D. (2013) Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning, *Computers & Education*, 63, 160-175.
Davis, F. (1989). Perceived Usefulness, perceived ease of use, and user acceptance of information technology.*MIS Quarterly,* 13, 319-339.
Fishbein, M. &Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley
Golonka E., M., Bowles, A., R., Frank, V., M., Richardson, D., &Freynik, S. (2014) Technologies for foreign language learning: a review of technology types and their effectiveness. *Computer Assisted Language Learning, 27*(1), 70-105,
Huang, H. (2013). E-reading and e-discussion: EFL learners' perceptions of an e-book reading program. *Computer Assisted Language Learning, 26*(3), 258-29
Huang, H. M., &Liaw, S. S. (2005). Exploring users' attitudes and intentions toward the Web as a survey tool. *Computers in Human Behavior,*. 21, (5), 729-743.
Johnstone, S. (1991). Research on telecommunicated learning: Past, present and future. *The Annals of the American Academy of Political Science, 514,* 49-57.

Hilgenberg, C., &Tolone, W. (2000). Student perceptions of satisfaction and opportunities for critical thinking in distance education by interactive video. *The American Journal of Distance Education, 14*(3), 59-73.

Hoshi, M. (2002). Practices, beliefs and perceptions of Japanese EFL self-access learners toward Internet-based language learning. *CALL-EJ Online, 4*(1), 1-13.

Hua, J-H., P., Clark H. K. T. & Ma W., W. (2003) Examining technology acceptance by school teachers: a longitudinal study. *Information & Management* 41, 227–241

Junco, R. (2012).The relationship between frequency of Facebook use, participation in Facebook activities, and student engagement.*Computers & Education*, 58(1), 162-171.

Khine, M. S. (2001). Attitudes toward computers among teacher education students in Brunei Darussalam. *International Journal of Instructional Media,* 28(2), 147-153

Kirkup, G., & Jones, A. (1996). *New technologies for open learning: The superhighway to the learning society?* London: Routledge.

Kocoglu, Z., Ozek, Y., &Kesli, Y. (2011). Blended learning: Investigating its potential in an English language teacher training program. *Australasian Journal of Educational Technology,* 27(7), 1124-1134

Kumar, P. &Kumar,A (2003). Effect of web-based project on pre-service and in-service Teachers' attitudes toward computers and their technology skills. *Journal of Computing in Teacher Education,19*(3), 87-92.

Larson, D., & Sung, C. (2009). Comparing student performance: Online versus blended versus face to face. *Journal of Asynchronous Learning Networks,* 13 (1) 31-42

Lee, B-C., Yoon, J-O.& Lee, I. (2009). Learners' acceptance of e-learning in South Korea: Theories and results. *Computers & Education*, 53 (4) 1320-1329.

Lee, M-C. (2010). Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation–confirmation model.*Computers & Education,* 54(2), 506-516

Moon, J. W., & Kim, Y. G. (2001). Extending the TAM for a world-wide-web context. *Information & Management*, 38(2), 217–230.

Ngai E.W.T., Poon,. J.K.L.&Chan Y.H.C. (2007). Empirical examination of the adoption of WebCT using TAM. *Computers & Education* 48 (2) 250–267

Oberg, A. & Paul Daniels P. (2013) Analysis of the effect a student-centred mobile learning instructional method has on language acquisition *Computer Assisted Language Learning. 26(2*) 177-196

O'Brien, M.G., & Levy, R.M. (2008). Exploration through virtual reality: Encounters with the target culture. *Canadian Modern Language Review*, 64, 663–691.

Orr, M. (2008). Learner perceptions of interactive whiteboards in EFL classrooms.CALL-EJ, Online 9 (2) .Retrieved June 30, 2012 from http://callej.org/journal/9-2/orr.html.

Padilla-Meléndez, A., del Aguila-Obra A.R.&Garrido-Moreno A. (2013) Perceived playfulness, gender differences and technology acceptance model in a blended learning scenario, *Computers & Education*, 63, 306-317.

Prensky, M. (2001). Digital natives, digital immigrants. Part 1. *On the Horizon*, *9*(5).

Rogers, M. (1995). *Diffusion of innovations (4th ed.)*. New York, NY: TheFreePress.

Rybak, S. (1984). Foreign languages by radio and television: A national support strategy for adult home-learners. *British Journal of Language Teaching, (22)* 3,.151-159.

Saade G. R. & Kira D. (2007). Mediating the impact of technology usage on perceived ease of use by anxiety. *Computers & Education 49*1189–1204

Saga, V., &Zmud, R. The nature and determinants of IT acceptance, routinization, and infusion. IFIP Transactions A. *Computer Science and Technology* A-45 67-86.

Sanders, D. W. &Morrison-Shetlar, A. (2001). Student attitudes toward Web-enhanced instruction in an introductory biology course. *Journal of Research on Computing in Education, 33*(3), 251-262.

Sang, G., Valcke, M., van Braak, J., &Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviours with educational technology, *Computer & Education,* 54, 103-112.

Sankaran, S. R., Sankaran, D., &Bui, T. X. (2000). Effect of student attitude to course format on learning performance: An empirical study in Web vs. Lecture instruction. *Journal of Instructional Technology,* 27, 66-73.

Sanprasert, N. (2009). The application of a course management system to enhance autonomy in learning English as a foreign language.*System,* 38(1), 109–123

Sathe, N., &Waltje, J. (2008). The iPod project: A mobile mini-lab. Journal of the Research Center for Educational Technology (RCET), 4, 32–56

Schmid, E.C. (2007). Enhancing performance knowledge and self-esteem in classroom language learning: The potential of the ACTIVote component of interactive whiteboard technology. *System*, 35, 119–133

Shih, Y.-C., & Yang, M.T. (2008). A collaborative virtual environment for situated language learning using VEC3D. *Educational Technology & Society, 11*, 56–68.

Stone, H. (1990). Does interactivity matter in video-based off-campus graduate engineering education? College Industry Education Conference Proceedings.

Sykes, J. M. (2008). A dynamic approach to social interaction: SCMC, synthetic immersive environments & Spanish pragmatics. Unpublished doctoral dissertation, University of Minnesota, Minneapolis, MN.

Tapscott, D. (1998). *Growing up digital. The rise of the Net Generation.*New York:

McGraw-Hill.

Taylor, S., & Todd, P. A. (1995a). Assessing IT usage: The role of prior experience. *MIS Quarterly*, 19(4), 561–570.

Thomas, R.M. & Kobayashi, V.N. (1987) *Educational Technology – its creation, development and cross-cultural Transfer.* New York: Pergamon Press.

Tozcu, A. (2008). The use of interactive whiteboards in teaching non-roman scripts.*Computer Assisted Language Learning*, 21, 143–166

Tzeng, J. (2011). Perceived values and prospective users' acceptance of prospective technology: The case of a career e-portfolio system, *Computers & Education,* 56, 157-165.

Venkatesh, V. (2000). Determinants of perceived ease of use: integrating control, intrinsic motivation, and emotion into the technologyacceptance model. *Information Systems Research*, 11, 342–365.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly,* 27, 425–478

Wehner, A. K., Gump, A., W. & Downey S.(2011) The effects of Second Life on the motivation of undergraduate students learning a foreign language. *Computer Assisted Language Learning 24,* Issue 3, pages 277-289

Wu E., Lin W-C. & Yang S.C. (2013). An experimental study of cyber face-to-face vs. cyber text-based English tutorial programs for low-achieving university students. *Computers & Education* 63, 52–61

Yuen, H. K. &Ma, W. K. (2002). Gender differences in teacher computer acceptance. *Journal of Technology and Teacher Education,* 10(3), 365-382.

Yukselturk, E. &Bulut, S. (2007). Predictors for student success in an online course. *Educational Technology & Society*, 10 (2), 71-83.

Zhao, Y. (2003) Recent developments in technology and language learning: A literature review and meta-analysis. CALICO Journal, 21(1), 7–28.