

# Not as Easy as E-Mail: Tutors' Perspective of an Online Assignment Submission System

**Orit Naor-Elaiza**

The Graduate School of Business  
Administration,  
Bar-Ilan University and  
The Open University of Israel  
oritna@openu.ac.il

**Nitza Geri**

The Department of Management  
and Economics  
The Open University of Israel  
nitzage@openu.ac.il

## Abstract

The continued use of a system beyond initial adoption is one of the most challenging issues in information systems research. This study examines the continued use of an online assignment submission system, which was implemented in a blended distance learning university, from the perspective of the tutors. Currently, after nine years of implementation, about half of the assignments are submitted via the system. The research model, which is based mainly on the technology acceptance model (TAM) and diffusion of innovation theory, has been empirically examined with data collected via a Web survey from 89 course coordinators who also serve as tutors. The findings indicate that behavioral intention to use the system was influenced mainly by its compatibility with the assignment checking process, its perceived usefulness, its real value, and tutors' attitude toward new technologies. The findings suggest that the system is not compatible with the checking process of those tutors who are reluctant to use it, and that it may also be related to their preference for reading from paper rather than a screen.

**Keywords:** technology acceptance model (TAM), diffusion of innovation, information systems continued use, human computer interaction, instructional technologies.

## Introduction

One of the most challenging issues in information systems research is identifying the factors that affect continued use or discontinuance of a system beyond initial adoption (Bhattacharjee, 2001; Delone & Mclean, 1992; 2003). This study examines an online assignment submission system that seems similar to an e-mail system, which was implemented in a blended distance learning university. Such a system is expected to be valuable mostly in a distance or blended learning environment since it expedites the process of task handling and provides students with fast feedback on their work (Chan & Waugh, 2007; Levy, 2006). However, after seven years of implementation, the online system examined in this study, handled less than 20% of the assignments. A major effort by the university management to encourage the system's use resulted in a substantial increase in the rate of adoption during the last two years. Yet, currently, about half of the assignments are submitted via the system.

This paper is part of an on-going comprehensive research that examines all the parties concerned with the assignments system: students, tutors, course coordinators and the university management, and investigates the reasons for its slow adoption rate. The research model is based primarily on the technology acceptance model (TAM) (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Venkatesh, Morris, Davis, & Davis, 2003) and diffusion of innovation theory

(Rogers, 1962, 2003). The first part of the study addressed the students through a Web survey, which was answered by over a 1,000 students, who were divided into three groups: non-users, former users (those who have used the system, but apparently abandoned it), and users. The findings suggest that the slow adoption rate of the relatively simple system may result from insufficient support of the more complex assignment preparation and the assignment checking processes (Naor-Elaiza & Geri, 2008; Geri & Naor-Elaiza, 2008).

This paper focuses on the tutors. Virtually, all the tutors use the system, but actually, some of them just use it sporadically or not at all. The students may choose how to submit their assignments, and the tutors may influence their decision in various ways, including telling them explicitly not to use the system. The tutors' attitudes toward the assignments system have first been surveyed by the Evaluation Department of the Open University of Israel in June 2007 (Alberton, 2007), and the findings of that study have contributed to the research model described in the following section. The results reported in this paper are based on data collected by the authors in July 2008, from 89 course coordinators who also serve as tutors.

### **The Research Model and Hypotheses**

Figure 1 presents the proposed research model. The first six hypotheses are based on TAM (Davis, 1989) and information economics (Ahituv, 1989; Raban, 2007) and were supported in prior research (Venkatesh et al., 2003). According to TAM, behavioral intention is influenced by two main constructs:

*Perceived Usefulness* - the degree to which an individual believes that using a particular system would enhance their performance.

*Perceived Ease of Use* - the degree to which an individual believes that using a particular system would be free of physical or mental effort.

*H1*: Real value of an information system positively influences its perceived usefulness.

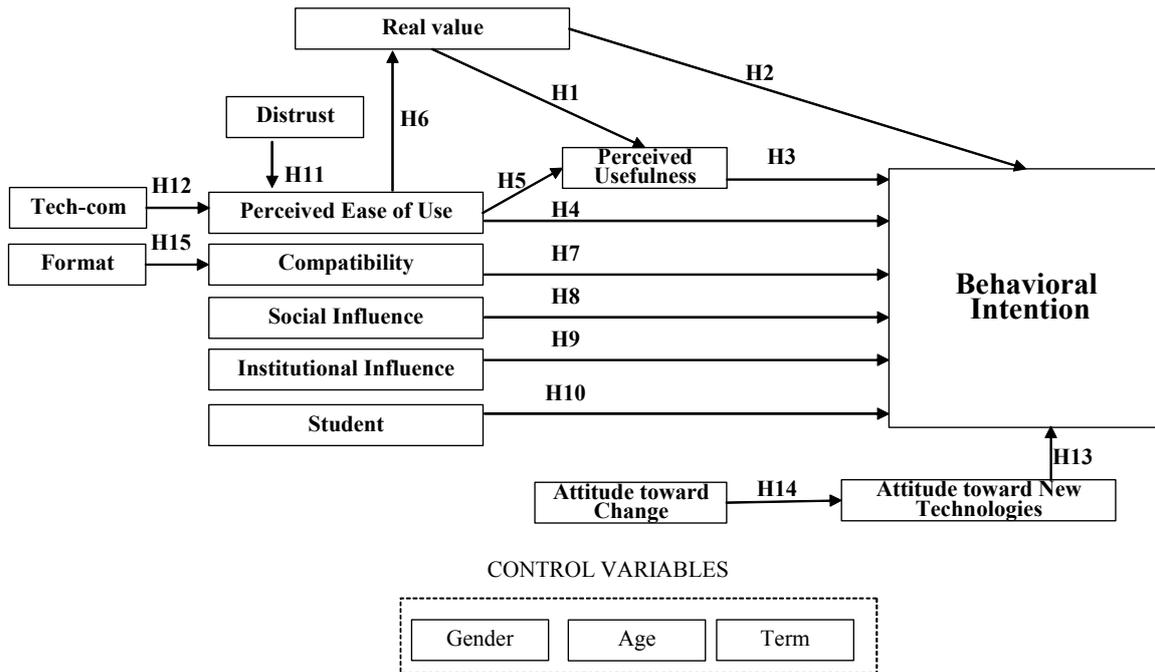
*H2*: Real value enhances behavioral intention.

*H3*: Perceived usefulness enhances behavioral intention.

*H4*: Perceived ease of use enhances behavioral intention.

*H5*: Perceived ease of use positively affects perceived usefulness.

*H6*: Perceived ease of use positively influences real value.



**Figure 1. The Proposed Model**

The next nine hypotheses are suggested based on diffusion of innovation theory (Rogers 2003) and information systems adoption research (Jeyaraj, Rottman, & Lacity, 2006), as well as insights from the Evaluation Department tutors' study (Alberton, 2007).

*Compatibility* is the extent to which adopting the innovation is compatible with what the potential users do.

*H7*: Compatibility positively influences behavioral intention.

*Social influence* refers to the influence of others, such as friends and colleagues, on the individual (Ajzen & Fishbein, 1980).

*H8*: Social influence has a positive effect on behavioral intention.

*Institutional influence* refers to the University authorities' actions.

*H9*: Institutional influence positively affects behavioral intention.

Nearly half of the tutors who participated in the Evaluation Department study (Alberton, 2007) indicated that they used the assignments system due to their students' requests.

*H10*: Perceiving the system as enhancing students' utility positively influences behavioral intention.

*Trust* in the context of this study is defined as the extent to which the innovation adopter perceives the innovation provider to be trustworthy (Barnes & Huff, 2003).

*H11*: Distrust negatively influences perceived ease of use.

*Technical compatibility* refers to the technical aspects of using a computer during the assignment checking process, such as place of work or ease of file downloading and uploading.

*H12*: Technical compatibility enhances perceived ease of use.

Those who are more adaptive to change will tend to have a positive attitude toward adopting new technologies, and people that are more inclined to use new technologies are more likely to try new information systems (Rogers, 2003).

*H13: Attitude toward new technologies positively affects behavioral intention.*

*H14: Attitude toward change positively influences attitude toward new technologies.*

*Format preference* refers to tutors' possible preference for reading from paper rather than a screen. Some tutors may feel that their ability to critically read assignments is enhanced when they read a printed document (Eshet-Alkalai & Geri, 2007) or may feel uncomfortable when reading from a screen.

*H15: Preference for paper format negatively influences compatibility.*

The model was controlled for: gender, age and term, which is the number of semesters that the tutor has been using the assignments system.

## **Methodology**

The assignments system was inaugurated in February 1999 (semester 1999b) and 123 assignments were submitted through it. Seven years later, during semester 2006b, 34,500 assignments were submitted via the system, which were only 19.2% of the assignments submitted on that semester. As of 2007, the University management encourages the implementation of the system in all courses. Nevertheless, the students still have the choice not to use the system. During semester 2008b, the assignments system handled 46% of the assignments.

The questionnaire was based mainly on items that were validated in the student surveys (Naor-Elaiza & Geri, 2008; Geri & Naor-Elaiza, 2008) and were adjusted to reflect the instructor perspective. Since the population of course coordinators is not large, five course coordinators, who instruct diverse knowledge areas, were asked to answer the pilot version of the questionnaire and comment on it. Following the analysis of their feedback, the questionnaire was slightly refined.

The final questionnaire was sent by e-mail to all the 275 course coordinators of the Open University, in July 2008. 69 respondents answered the questionnaire within a week and an additional 27 responded after reminders, resulting in a total of 96 responses, which is an overall 34.9% effective response rate (the unusable partial responses were excluded from the analysis). Non-response bias was measured by comparing the early respondents and the late respondents, who answered after the reminding email, based on Armstrong and Overton (1977). There were no significant differences between the two groups. 89 respondents served also as tutors and their responses were analyzed in this study.

Data analysis was performed with Partial Least Squares (PLS) (Chin, 1998; Chin, Marcolin, & Newsted, 2003), using smartPLS 2.0 (beta) software (Ringle, Wende, & Will, 2005). PLS analyzes how the items load on their constructs simultaneously with estimating all the paths in the model, and is widely used in Management Information Systems research (Gefen & Straub, 2005). A PLS confirmatory factor analysis confirmed that all items loaded well on their respective factors, and all the construct loadings were much higher than the cross loadings (the results were omitted for brevity). Appendix 1 details the mean, standard deviation and PLS reliability of the constructs, as well as the correlation among the constructs and their square root of the average variance extracted (AVE). All these measures are above the limit values

suggested in the literature (Gefen, Straub, & Boudreau, 2000). Hence, the findings support adequate convergent and discriminant validity of the constructs.

## Results

Figure 2 presents the standardized PLS path coefficients model. The coefficients are shown next to the arrows, and are significant at least at the .05 level. The R-squared values are presented inside the box of the relevant constructs. All the other paths were insignificant. There were no gender and age differences in the model. There was a positive effect of the term of use on social influence, and a negative effect of the term on preference for printed format.

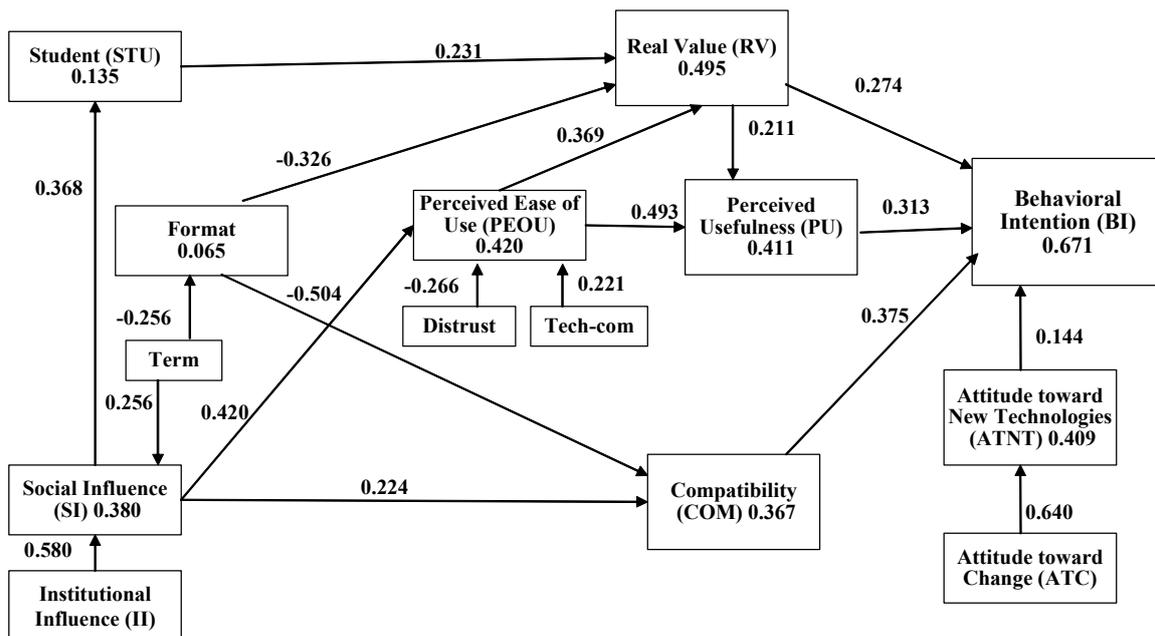


Figure 2. PLS Results for the Proposed Research Model

Behavioral intention of the tutors to use the assignment system was significantly influenced directly by its compatibility with the assignment checking process (H7), its perceived usefulness (H3), its real value (H2), and tutors' attitude toward new technologies (H13). There was no direct influence of perceived ease of use (H4), social influence (H8), institutional influence (H9), and students' utility (H10) on behavioral intention. However, all these constructs had an indirect positive influence on behavioral intention, as shown in Figure 2. Hypotheses H1, H5, H6, H11, H12, H14 and H15 were all supported.

## Discussion and Conclusions

This study is part of a comprehensive analysis of an apparently simple assignments system that examines the reasons for its slow adoption rate. The relatively high R-squared value (0.671) of the behavioral intention construct suggests that the research model can provide explanation for this phenomenon. The current study findings are in accord with prior studies of the assignments systems (Naor-Elaiza & Geri, 2008; Geri & Naor-Elaiza, 2008), which concerned the students, in the following main aspects:

- Behavioral intention to use the system is affected by its perceived usefulness and the potential users' attitude toward change.
- Perceived ease of use positively influences perceived usefulness.

However, unlike the student studies, which dealt with non-users and former users, the perceived ease of use did not affect behavioral intention of the tutors directly. The average value of this construct was quite high (6.03), but it seems that compatibility, perceived usefulness and real value of the system had the main influence on tutors' behavior. This discrepancy is expected since there is a difference between initial use of an innovation and intentions to continue such use in the future by those who have already used it (Agarwal & Prasad, 1997).

Also, based on the comments of the prior studies participants (Alberton, 2007; Naor-Elaiza & Geri, 2008; Geri & Naor-Elaiza, 2008), this study added the issue of format preference to the model. The findings suggest that reluctance to use the system may also be related to tutors' preference for reading from paper rather than a screen.

The practical implications of this study are that the system is not compatible with the checking process of those tutors that are reluctant to use it. Therefore, the system and work processes should become more compatible with tutors' needs in order to enhance its use.

### Acknowledgements

The authors are grateful to Yael Alberton and Dr. Relly Brickner of the Evaluation department, The Open University of Israel, for sharing the data of the tutors' survey that was conducted in June 2007. Special thanks to the anonymous course coordinators and tutors that participated in this study.

### References

- Agarwal, R., & Prasad, J. (1997). The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. *Decision Sciences*, 28(3), 557-582.
- Ahituv, N. (1989). Assessing the value of information: Problems and approaches. *Proceedings of the 10th Annual International Conference on Information Systems*, Boston, MA (December 1989): 315-325.
- Ajzen I., & Fishbein, M. (1980) *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Alberton, Y. (2007). *The online assignments submission system: A survey of tutors who have been using the system*. Internal report, the Evaluation department, The Open University of Israel (Hebrew).
- Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14(August), 396-402.
- Bhattacharjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly*, 25(3), 351-370.
- Barnes, S. J., & Huff S. L. (2003). Rising sun: iMode and the wireless internet. *Communications of the ACM*, 46(11), 78-84.
- Chan, M., & Waugh, R. (2007). Factors affecting student participation in the online learning environment at the Open University of Hong Kong. *The Journal of Distance Education / Revue de l'Éducation à Distance [Online]* 21(3), 23-38. Retrieved October 26, 2008 from <http://www.jofde.ca/index.php/jde/article/view/31>
- Chin, W. W. (1998). Issues and opinions on structural equation modeling. *MIS Quarterly* 22(1), 7-16.
- Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic mail adoption study. *Information Systems Research*, 14(2), 189-217.

- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13 (3), 318-340.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982-1004.
- Delone, W. H., & Mclean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60-95.
- Delone, W. H., & Mclean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9-30.
- Eshet-Alkalai, Y., & Geri, N. (2007). Does the medium affect the message? The influence of text representation format on critical thinking. *Human Systems Management*, 26(4), 269-279.
- Gefen, D., & Straub, D. W. (2005). A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the AIS*, 16(5), 91-109.
- Gefen, D., Straub, D. W., & Boudreau, M. C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the AIS*, 4(7), 1-78. Retrieved October 26, 2008 from <http://www.cis.gsu.edu/~dstraub/Papers/Resume/Gefenetal2000.pdf>
- Geri, N., & Naor-Elaiza, O. (2008). Beyond adoption: Barriers to an online assignment submission system continued use. *Interdisciplinary Journal of E-Learning and Learning Objects*, 4, 225-241. Retrieved October 26, 2008 from <http://ijello.org/Volume4/IJELLOv4p225-241Ger476.pdf>
- Jeyaraj, A., Rottman, J. W., & Lacity, M. C. (2006). A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, 21(1), 1-23.
- Levy, Y. (2006). The top 10 most valuable online learning activities for graduate MIS students. *International Journal of Information and Communication Technology Education*, 2(3), 27-44.
- Naor-Elaiza, O., & Geri, N. (2008). Easy as e-mail? Probing the slow adoption of an online assignment submission system. In Y. Eshet-Alkalai, A. Caspi, & N. Geri (eds.), *Learning in the technological era: Proceedings of the Chais conference on instructional technologies research* (pp. 94-101), Raanana, Israel: The Open University of Israel. Retrieved October 26, 2008 from [http://telem-pub.openu.ac.il/users/chais/2008/morning/1\\_2.pdf](http://telem-pub.openu.ac.il/users/chais/2008/morning/1_2.pdf)
- Raban, D. R. (2007). User-centered evaluation of information: A research challenge. *Internet Research*, 17(3), 306-322.
- Ringle, C. M., Wende, S., & Will, A. (2005). *SmartPLS 2.0 (beta)*. <http://www.smartpls.de>
- Rogers, E. M. (1962). *Diffusion of innovation*. New-York: The Free Press.
- Rogers, E. M. (2003). *Diffusion of innovation*, 5th edition, New-York: The Free Press.
- Venkatesh, V., Morris, G. M., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.

### Appendix 1. Mean, Standard Deviation, and PLS reliability together with the correlation among the constructs and their square root of the AVE

	Mean	Std. Deviation	PLS Reliability	ATC	ATNT	BI	COM	DisTrust	FORMAT	II	PEOU	PU	RV	SI	STU	TECH-COM	TERM
ATC	5.54	1.23	0.92	<b>0.847</b>	.	.	.	.	.	.	.	.	.	.	.	.	.
ATNT	5.21	1.28	0.88	0.640	<b>0.793</b>	.	.	.	.	.	.	.	.	.	.	.	.
BI	5.42	1.64	0.94	0.298	0.384	<b>0.830</b>	.	.	.	.	.	.	.	.	.	.	.
COM	5.05	1.81	0.86	0.155	0.159	0.640	<b>0.673</b>	.	.	.	.	.	.	.	.	.	.
DisTrust	2.15	1.07	0.88	-0.485	-0.313	-0.264	-0.331	<b>0.704</b>	.	.	.	.	.	.	.	.	.
FORMAT	3.63	1.89	0.91	-0.151	-0.165	-0.598	-0.566	0.246	<b>0.841</b>	.	.	.	.	.	.	.	.
II	6.11	1.02	0.91	0.021	-0.010	0.022	0.155	-0.169	-0.061	<b>0.830</b>	.	.	.	.	.	.	.
PEOU	6.03	1.05	0.96	0.218	0.103	0.588	0.437	-0.432	-0.292	0.257	<b>0.917</b>	.	.	.	.	.	.
PU	5.90	1.14	0.85	0.445	0.282	0.612	0.323	-0.397	-0.398	-0.050	0.618	<b>0.658</b>	.	.	.	.	.
RV	4.53	1.83	0.87	0.305	0.336	0.672	0.514	-0.294	-0.487	0.086	0.591	0.503	<b>0.773</b>	.	.	.	.
SI	5.27	1.07	0.87	0.185	0.095	0.436	0.365	-0.145	-0.278	0.561	0.501	0.282	0.342	<b>0.697</b>	.	.	.
STU	5.52	1.13	0.87	0.287	0.227	0.433	0.402	-0.225	-0.233	0.091	0.551	0.491	0.510	0.368	<b>0.696</b>	.	.
TECH-COM	4.78	1.57	0.82	0.150	0.082	0.309	0.319	-0.478	-0.307	0.025	0.428	0.410	0.288	0.190	0.281	<b>0.699</b>	.
TERM	3.62	0.90	single	0.247	0.309	0.286	0.210	-0.188	-0.256	-0.075	0.163	0.268	0.145	0.212	0.014	0.241	<b>1.000</b>