APPLYING TECHNOLOGY ACCEPTANCE MODEL TO MEASURE IT STUDENTS' ATTITUDE TOWARDS A HYBRID COMMUNICATION SKILLS COURSE

George Rigopoulos, Ioannis Keklikoglou, Cleo Sgouropoulou

ABSTRACT

In this paper we demonstrate the application of a revised TAM model for measuring IT students' attitude towards eLearning for a hybrid communication skills module. Technology Acceptance Model (TAM) in its original form and its consequent variations has been extensively incorporated as a methodology to measure attitude towards technology adoption from users in multiple domains. TAM variations have been proposed and applied within education domain as well regarding eLearning adoption with significant results. Based on the above, we present the model, as well as some preliminary results from a relevant survey at IT students attending a traditional communication skills module.

KEYWORDS
Technology acceptance model, communication skills, eLearning

INTRODUCTION

Communication skills taught in higher education either as autonomous academic module or as a seminar course can benefit from IT and eLearning technology developments. Major objective in both approaches is to improve students' oral and written expression as well as the ability to collaborate effectively within a group. To achieve this, topics ranging from verbal presentations' and written essays' preparation, to teamwork, group discussions and role playing are included. Incorporation of distance learning methods for building virtual teams can motivate students and increase retention to the module. A hybrid approach using traditional classroom lectures, as well as virtual lectures and students' presentations in a virtual class can increase effectiveness of the module.

In this paper we demonstrate the application of a revised TAM model for measuring IT students' attitude towards eLearning for a hybrid communication skills module. Technology Acceptance Model (TAM) in its original form and its consequent variations has been extensively incorporated as a methodology to measure attitude towards technology adoption from users in multiple domains. TAM variations have been proposed and applied within education domain as well regarding eLearning adoption with significant results. Based on the above, we present the model, as well as initial results from a relevant survey at IT students attending a traditional communication skills module.

TECHNOLOGY ACCEPTANCE MODEL

Technology Acceptance Model (TAM) was initially developed by Davis to provide an explanation of the determinants of computer acceptance (Figure 1). In general it is capable of explaining user behavior across a broad range of end-user computing technologies and user populations theoretically justified (Davis, 1989, 1993).

TAM is based on the following core concepts

- Perceived usefulness, which has been defined as a user's subjective perception of the ability of a computer to increase job performance when completing a task.
- Perceived ease-of-use, which is a person's subjective perception of the effortlessness of a computer system, which affects the perceived usefulness thus having an indirect effect on a user's technology acceptance.

TAM is derived from the Theory of Reasoned Action (TRA) model (Figure 2), which was developed by Fishbein and Ajzen to explain a broader range of behaviors based on situation specific combinations of personal beliefs and attitudes, and the effects of beliefs of others close to the individual (Szajna, 1996). The fundamental concept of TRA is that individuals will adopt a specific behavior if they perceive it will lead to positive outcomes (Compeau and Higgins, 1995).

An extensive body of subsequent research has confirmed the usefulness of TAM – and various extensions and revisions – as a tool for investigating and predicting user information technology acceptance (Taylor and Todd, 1995, Geffen and Straub, 2000; Doll et al, 1998).
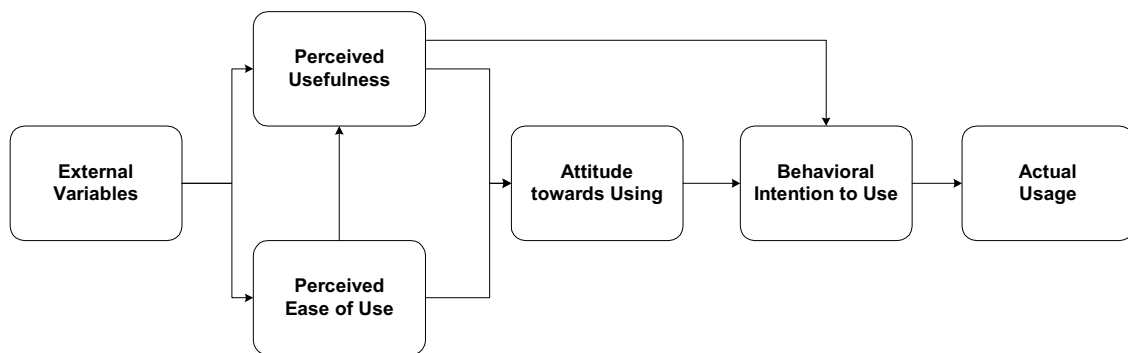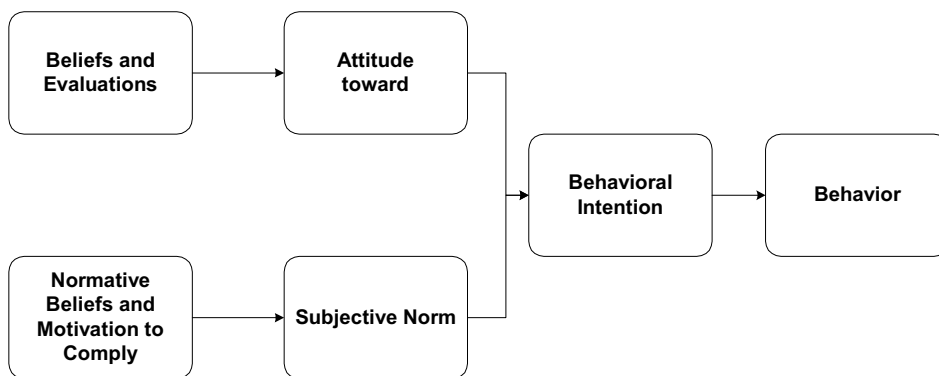

Figure. 1. Technology Acceptance Model (Davis)

Figure. 2. Theory of Reasoned Action (Fishbein and Ajzen)

RESEARCH MODEL

Since elearning technologies have been incorporated in order to facilitate traditional teaching, our main objective is to study student's attitude towards elearning technology within the frame of a traditional course setting, about communication skills for IT engineers. In order to perform the research, we followed TAM methodology and concepts, and used a revised TAM model (Figure 3), as proposed by Money (Money 2004), in order to identify relationship between Perceived usefulness and Perceived ease-of-use, and students' intention to use and usage of the new elearning technology.
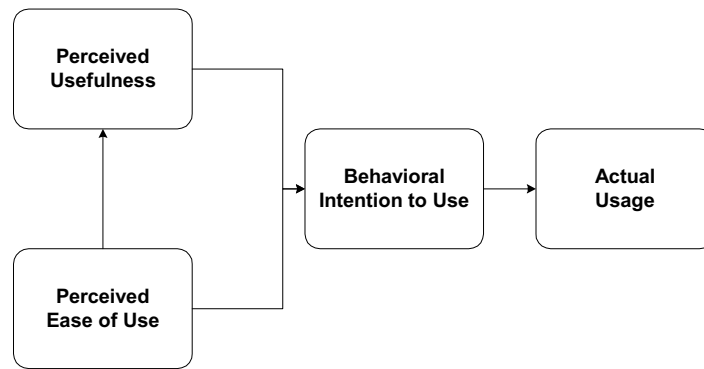
Figure 3. Research model (Money 2004)

As it is a preliminary research, the scope has been relative limited to identify correlations between key factors and become the initiation of a broader study. For this reason, we have formulated a relative small number of research hypotheses as shown in Table 1 based on the model stated above.

Table 1. Research Hypotheses

	Hypothesis
H1	Perceived usefulness will have a positive relationship with behavioral intention
H2	Perceived ease of use will have a strong indirect positive relationship to behavioral intention
H3	Perceived ease of use will have a less strong direct positive relationship to behavioral intention
H4	Behavioral intention will have a strong positive relationship to system usage
H5	Perceived usefulness and perceived ease of use will have a strong positive relationship to behavioral intention
H6	Perceived usefulness and perceived ease of use will have a strong positive relationship to actual usage

METHODOLOGY

The study was conducted at Technological Educational Institute of Athens. Questionnaires based on the constructs (Table 2) were used to collect the data. Items used Likert scales ranging from 1 = strongly disagree to 7 = strongly agree. The questionnaire was completed by IT students enrolled to the traditional communication skills class. In Table 3 we present some demographic data and characteristics of the sample.

Table 2. Construct items

The construct items

Perceived usefulness
1. New service is useful for the course.
2. New service makes the course attendance easier.
3. New service makes the course attendance more convenient.
4. New service makes the course deployment faster.

Perceived ease-of-use
1. New service is easy to use.
2. New service is easy to understand.
3. New service is simple.
4. Using the new service can be easily skilful.

Behavioral intention to use

1. I think that using the new service is a good idea.
2. I think that using the new service is beneficial for me.
3. I have positive perception about using the new service.

Usage
1. I intend to use new service frequently.
2. I intend to use new service to assist my tasks.

Table 3. Sample characteristics

Total sample size (responded)	98	
Gender	Female	45
	Male	53
Demographics	**Mean**	**Std. Dev.**
Age	22.3	7.6
Years of IT use	7.2	4.5
Weekly Hours of IT use	16.3	13.7
Internet usage	**Percentage**	
Daily	93.5 %	
Weekly	5.9 %	
Monthly	0.4 %	
A few times a year	0.1 %	
Intention to use online cource	**Percentage**	
Yes	49.2 %	
Maybe	25.4 %	
No	25.4 %	

RESULTS

For the data analysis, we calculated Cronbach Alpha reliability coefficients for each construct as shown in Table 4. The reliability of all measurement scales was above the recommended minimum level of .70 and the desirable level of .80 for social science research. Due to the limited sample size, statistical analysis was limited to correlation and regression analysis. Correlation analysis results appear in Table 5 which includes the observed correlations. Figure 4 also depicts the results and the associated p-values in accordance with the research model.

Table 4. Cronbach alpha

Construct	Cronbach alpha
Perceived usefulness	0.901
Perceived ease-of-use	0.932
Behavioral intention to use	0.823
Usage	0.899

Table 5. Correlation of constructs

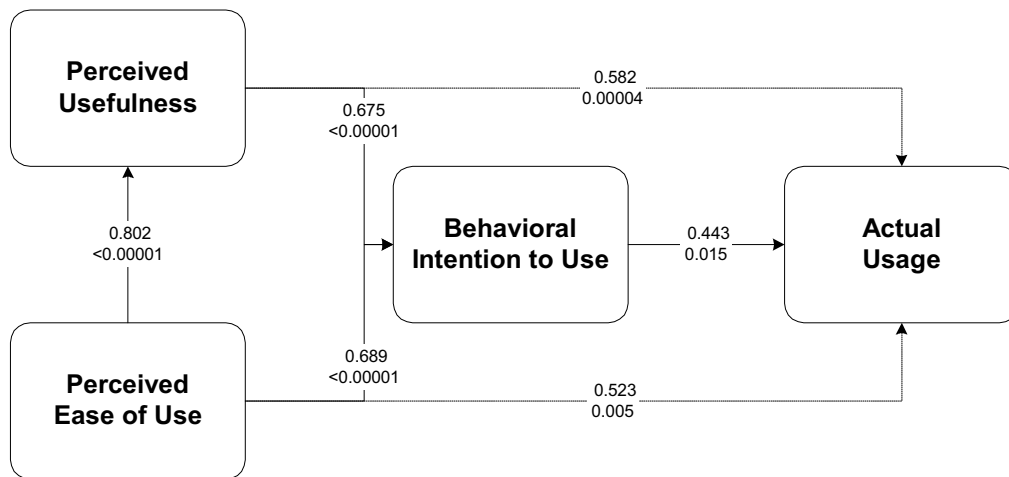| Constructs	(1)	(2)	(3)	(4)
(1) Perceived usefulness	1	0.802	0.675	0.582
(2) Perceived ease-of-use	0.802	1	0.689	0.523
(3) Behavioral intention to use	0.675	0.689	1	0.443
(4) Usage	0.582	0.523	0.443	1

Figure. 4. Research model with correlations

In Table 6, we summarize the findings regarding the research hypotheses resulting from the above data analysis, where all six hypotheses are supported.

Table 6. Hypotheses results

	Hypothesis	Support
H1	Perceived usefulness will have a positive relationship with behavioral intention	Yes
H2	Perceived ease of use will have a strong indirect positive relationship to behavioral intention	Yes
H3	Perceived ease of use will have a less strong direct positive relationship to behavioral intention	Yes
H4	Behavioral intention will have a strong positive relationship to system usage	Yes
H5	Perceived usefulness and perceived ease of use will have a strong positive relationship to behavioral intention	Yes
H6	Perceived usefulness and perceived ease of use will have a strong positive relationship to actual usage	Yes

CONCLUSION

In this short paper, we present some initial findings from a survey, in order to identify IT students' attitude towards elearning within a communication skills course. Our target was initially to evaluate TAM within this setting, and further to collect some findings in order to continue to a wider research setting.

The small sample is one of the limitations of the study. The sample was limited to one particular higher educational setting, at one point in time, and was therefore too limited for broad generalizations. In order to generalize the results, some further studies are needed in different academic contexts and settings.

Another limitation was the distribution method of the survey instrument. The survey was delivered to students online by e-mail. Students, who did not answer the e-mail, may not have received or completed the survey. Results of the study may have been influenced by a larger number of respondents.

However, while the study provides only preliminary results, these results provide a foundation for future studies that link the academic environment and IT acceptance.

REFERENCES

Compeau, D. Higgins, C., (1995). Computer Self-Efficacy: Development of a Measure and Initial Test, MIS Quarterly.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13, 31-340.

Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavior impacts. International Journal of Man Machine Studies, 38, 475-487.

Doll, W., Hendrickson, A., Xiandong, D., (1998). Using Davis's Perceived Usefulness and Ease-of-Use Instruments for Decision Making: A Confirmatory and Multi-Group Invariance Analysis, Decision Sciences, Vol. 29, No. 4.

Gefen, D., Straub, D., (2000). The Relative Importance of Perceived Ease of Use in IS Adoption: A Study of Ecommerce Adoption, Journal of the Association of Information Systems.

Money, W. (2004). Application of the Technology Acceptance Model to a Knowledge Management System, Proceedings of the 37th Hawaii International Conference on System Sciences,

Szajna, B. (1996). Empirical Evaluation of the Revised Technology Acceptance Model¸ Management Science, Volume 42, No. 1.

Taylor, S., Todd, P., (1995). Understanding Information Technology Usage: A Test of Competing Models, Information Systems Research, Volume 19.

George Rigopoulos
School of Electrical & Computer Engineering,
National Technical University of Athens,
9 Iroon Polytechneiou Str, 15773 Athens, Greece,
Email:grigop@epu.ntua.gr

Ioannis Keklikoglou
Department of Informatics,
Technological Educational Institute of Athens,
Ag. Spyridonos, 122 10 Aigaleo, Athens, Greece,
Email:ikek@teiath.gr

Cleo Sgouropoulou
Assistant Professor,
Department of Informatics,
Technological Educational Institute of Athens,
Ag. Spyridonos, 122 10 Aigaleo, Athens, Greece,
Email:csgouro@teiath.gr