

# STUDENT PODCAST ADOPTION: AN EMPIRICAL STUDY

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## ABSTRACT

Recent years have witnessed rapid advancement in technologies. Podcasting which is one of the technologies that was found for personal entertainment or for information usage, has become one of the fastest growing technologies in distance learning over the past several years. This study attempts to identify the factors that drive students to adopt podcast by proposing an integrated and a holistic model that represent the factors that may have an impact on podcast adoption. The Technology Acceptance Model (TAM) is employed as the base model for this study and it is modified by adding other factors from the Diffusion of Innovation Theory.

**Keywords:** Podcast Adoption, Technology Adoption, Online Learning, Distance Learning, Technology Acceptance Model, Diffusion of Innovation Theory

## INTRODUCTION

Technology advancement has affected so many things in people's life and changed the dynamics of each delivery option over years, and education is not a special case. Nowadays, people are engaging in so many things and time is limited for them, that what led institutions to offer online classes. The rapid growth of online distance education has enabled learners to access education at any time and from any place (Beldarrain, 2006). At the same time adult learners increasingly expect a personal or customized learning environment (Bolliger et al., 2010). At the beginning e-learning software were used in order to fulfill this task. But again with time, professors realized that e-learning tools are not sufficient tools since they lack the face-to-face and social interaction (Carr, 2000) and students feel isolated. Later and by using technology, educators were able to personalize and humanize e-Learning by including rich media components in online courses that attempt to engage students in active, meaningful learning environment (Lee, Tan, & Goh, 2004) by adopting the podcast and change it from an entertainment tool to a learning tool. Nowadays, it can be seen that podcasting as a growing educational tool has been adopted by several universities (Bennet, 2006; Copley, 2007; Lee et al., 2008; Vogt et al, 2010).

Podcasting have many benefits; one of the benefits of these devices is that they allow learners to study anywhere and at anytime they find it convenient to them. Today's learners have increasing demands on their time, and many of them have a part or full time jobs. Thus, they are often forced to study in their lunch breaks, in the evenings and at weekends (Evans, 2008). A second benefit is the mobility which allows them to access the material anytime they want and review it

several times. There is no need for them to stay in front of their PCs / laptops, at the lab, or at the library to study. Once the podcast is downloaded, it can be used from anywhere and anytime on the bus, in the car, at the gym, etc. Another benefit can be in case a student is sick and not able to attend a class. By downloading the podcast, he/ she can catch up with the remainder of the class and not miss anything from the materials. The same case can be applied in case a professor is not able to give a class. Moreover, podcasts is a helpful tool for students who may not have grasped a topic fully in the classroom. They can now learn the material by themselves in a convenient way (Tavales & Skevoulis, 2006). Thus, podcasts can be an essential instrument in helping students acquiring new skills and improving their academic achievement. This is because they involve themselves in the fulfillment of the task and they become constructor of their own knowledge (Cruz & Carvalho, 2006). In the same vein, researchers such as Evans (2008) claims that students are more receptive to learning material provided in the form of a podcast than a traditional lecture or textbook and that students believe that podcasts are more effective revision tools than textbooks, and more efficient than their own notes in helping them to learn. These previously mentioned benefits have led researchers to describe podcast as a portable, flexible, and convenient tool to access (Cebeci & Tekdal 2006; Copley, 2007; Evans, 2008; Lee & Chan, 2007; Vogt et al, 2010). On the other hand, others (Chan & Lee, 2005; Miller & Piller, 2005; Ractham & Zhang, 2006) were more interested in the educational benefits of podcasts such as, increasing students' satisfaction ratings, reducing student anxieties, as well as their easiness.

At the beginning, podcast was found for personal entertainment or for information usage but currently it is used for many different subjects, from music to technology, news to foreign languages, politics to education (Lazzari, 2009, Walls et al, 2010). This multi-usage benefits has led to an increase in the number of portable music players and podcasting during the last few years (Campbell, 2005). Podcasting has become one of the fastest growing technologies over the past several years (Shim et al., 2007). According to pew internet survey in 2006, 20% of American adults and 26% of internet users, report ownership of an iPod or MP3 player. Of these people, six million have downloaded podcasts and it is expected that podcasting is going to reach 12.3 million households by 2010 (Crofts et al. 2005; Forrester Research, 2005; Rainie & Madden, 2005). This large increase in demand for podcasting in different field as mentioned and in the educational sector precisely, attracted us to study the factors that can lead people to adopt this technology.

## **STATEMENT OF PURPOSE**

Based on literature related to podcasting, e-learning and mobile learning, and based on a theoretical models such as the diffusion of innovation theory (Rogers, 1983), and technology acceptance model (Davis et al, 1989), this paper intends to: identify the factors that are most likely to be associated to podcasting adoption; and develop a conceptual model that depicts the relationships between these factors and podcasting adoption. Studying the factors could be of help for the new institutions which are planning to adopt this technology in their system, as well as it enriches the literature since no previous research have used this study's model before. Based on this, the study is believed to be useful for many groups, namely IT developers, instructional designers, and researchers. IT developers may find the study useful for taking the technology

aspects of the podcasting into consideration, and in coordinating their efforts with instructional designers in order to get the best benefit out of podcasting. On the other hand, researchers can make use of the model as a base and later try to build on top of it so as to enrich the body of knowledge.

In order to achieve the objective of this study, we are going to answer the following research questions:

1. What are the factors leading users to adopt podcast?
2. To what extent can these factors contribute to the enhancements of podcast adoption?

In order to answer these questions, a model will be developed based on a theoretical framework and literature review. As mentioned previously the DoI and TAM were used in this study as a base model in order to study the factors leading to adopt podcasting. The DoI and TAM have been modified in this study and that is because of many reasons:

1. The TAM has been used in work related environment where users do not care about some factors such as mobility and image. These factors have a big impact on the users' intention to adopt podcasting on contrary to the adoption of technology in organization environment.
2. Since the TAM has been used in organizations, users' do not have the ability to express themselves freely. Adding other factors such as enjoyment is important. This factor is defined by behavioral sciences and psychology as important determinant of users' intention to adopt new things.
3. Last, the TAM's ability to explain intention to use various forms of technology is limited, and explained variance is typically approximately 40 percent (Venkatesh & Davis 2000).

Thus, a model that has these previously mentioned factors is presented in this study in Figure 1. The next section will discuss the theoretical framework upon which the study relies. Following this, will be a presentation of the study's hypotheses, and a depiction of the conceptual model.

## **THEORETICAL FRAMEWORK**

### **Technology Acceptance Model**

The Technology Acceptance Model (TAM) provides a well-established model for evaluating and predicting user acceptance of information technology (Davis, 1989; Venkatesh & Davis, 2000). The TAM has also been used to evaluate the use of internet-based technology in higher education programs (Saade' et al., 2007). A key tenet of the framework is the assumption that user acceptance is likely greater if the user perceives the technology as useful and easy to use (Davis, 1989.)

### **Diffusion of Innovation Theory**

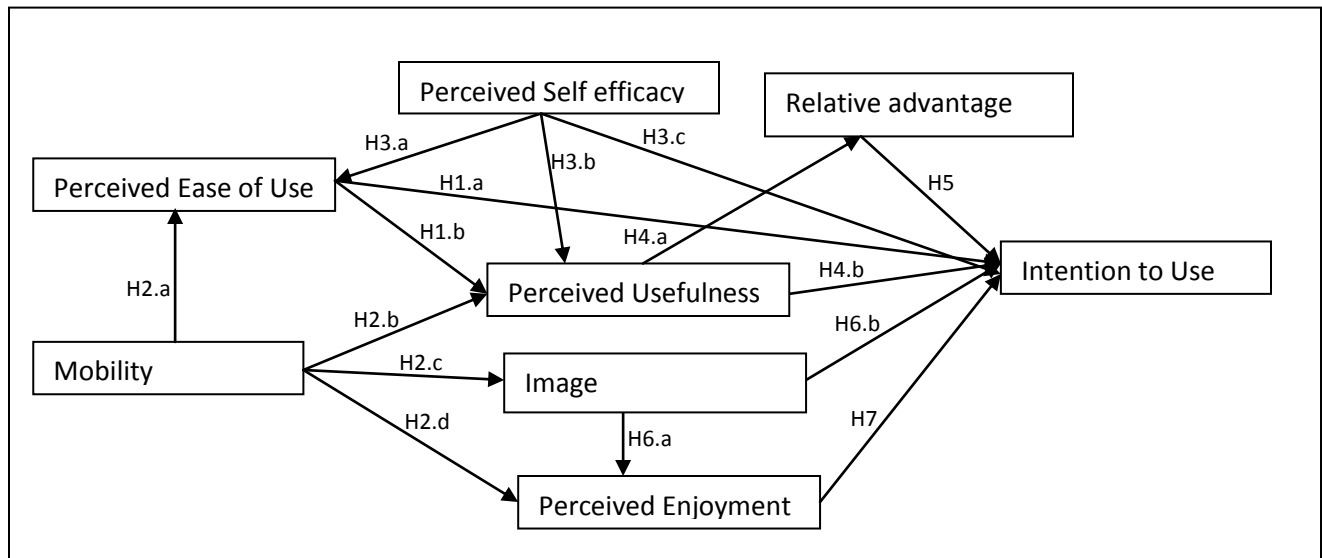
The theoretical foundation for most technology adoption research is found in the diffusion of innovation literature (Rogers, 1983) which studies the process of technology diffusion and the factors influencing technology adoption decisions. Diffusion is defined as the process by which an innovation is adopted and gains acceptance by people (Rogers, 1995). Innovativeness is defined as the degree to which an individual makes innovative decisions independently of the

communicated experience of others (Midgley & Dowling, 1978). That is, it is an individual's predisposition to behave in a given way regardless of the stimuli that activates the behavior (Foxall & Szmigin, 1999). This simply means that innovativeness is viewed as an enduring personality trait possessed to a greater or lesser degree by all individuals. An innovation will be adopted slowly at first then increases its diffusion speed as more and more people adopt it. Thus, individuals can be classified into five adopter categories based on their innovativeness. These categories are: innovators, early adopters, early majority, late majority, and laggards. In addition to the characteristics of adopters, there are different characteristics of innovations that also help to explain the differences seen in adoption rates. Usually potential adopters judge an innovation based on their perceptions in regard to five characteristics of the innovation. These characteristics are: Relative Advantage; Compatibility; Complexity; Trialability; and Observability.

### RESEARCH MODEL AND HYPOTHESES

Most of the work in TAM was done on technologies that were introduced into organizations which do not describe the complete voluntary usage of technologies as in the case of podcast. Moreover, previous research in this area has been conducted from an extrinsic motivation perspective. Thus, in order to provide a broader view and a better explanation of podcast adoption, the TAM model has been modified in this study by adding other factors that affect the adoption of podcast. These factors are: mobility, image, computer self efficacy, relative advantage, and perceived enjoyment. Graph 1 depicts the research model used in this study. Following are the factors of the model as well as the hypotheses.

**Figure 1:** Podcast adoption model.



## **Perceived Ease of Use (PEoU)**

PEoU is the degree to which a person believes that using a particular system would be free of effort (Davis, 1989). In fact, easy and simple technologies can be accepted faster by the users. Researchers (Evans, 2008; Ractham & Zhang 2006) suggest that producing podcasts is relatively easy for educators. Thus, since podcast does not need much experience and does not have complicated system, PEoU became an important factor toward the intention of users to adopt podcast. Moreover, researchers such as Heijden (2004) argued that PEoU has an indirect effect on intention to use through Perceived Usefulness.

Therefore, we proposed the following hypotheses:

***H1.a:** Perceived ease of using podcast has a significant positive effect on perceived usefulness of podcast.*

***H1.b:** Perceived ease of using podcast has a significant positive effect on intention to use podcast.*

## **Perceived Mobility**

Perceived mobility in this study is the extent to which users can access the podcast anytime and anywhere with no restrictions. As mentioned previously the aim behind the invention of the podcast was to help people get the needed data and information easily at anytime and anyplace convenient to them (Bolliger et al., 2010; Chan et al., 2006; Donnelly & Berge, 2006; Harris & Park, 2008; Shim et al. 2006). Once downloaded, podcasts can be transferred and used with a variety of portable devices such as the iPod, handheld computers, as well as many modern mobile phones and personal digital assistants (Boulos et al., 2006; Cebeci & Tekdal, 2006; Lee et al., 2008). Students are no longer obliged to stay in a specific place to study and prepare for their classes (Walls et al, 2010).

Consequently, we hypothesize:

***H2.a:** Perceived mobility has a positive influence on perceived ease of using podcast.*

***H2.b:** Perceived mobility has a positive influence on perceived usefulness of podcast.*

***H2.c:** Perceived mobility has a positive influence on image.*

***H2.d:** Perceived mobility has a positive influence on perceive enjoyment.*

## **Perceived Self-Efficacy**

Perceived self-efficacy can be defined as the individuals' judgment of their ability to perform the actions required for success. In the podcasting case, self-efficacy can be divided to two types: perceived efficacy toward the technology and academic self-efficacy. Students with higher academic self efficacy would be expected to put more effort into tasks and be more persistent in their academic pursuits (Sander & Sanders, 2006). Thus, this in its turn affects the self-efficacy toward technology. Also in our case, we expect that higher the level of technology self-efficacy, the more the students will find podcasting easy and useful for them. Thus, we hypothesize:

***H3.a:** An individual's computer self-efficacy is positively related to his or her perceived ease of use about podcast.*

***H3.b:** An individual's computer self-efficacy is positively related to his or her perceived usefulness about podcast.*

*H3.c: An individual's computer self-efficacy is positively related to his or her intention to use podcast.*

### **Perceived Usefulness (PU)**

PU is the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989). PU which is one of the important factors of the TAM that has been proved in many IS research that it is important (Yu et al., 2005, Taylor & Todd, 1995, Pikkarainen et al., 2004) toward the intention of the users' adoption of new technology. This relationship was found direct as well indirect through the perceived relative advantage of the technology (Wang et al., 2011). Previous research found that the majority of students in traditional courses rated podcasts as very useful (Copley, 2007), other claims that students are more receptive to learning material provided in the form of a podcast than a traditional lecture or textbook (Evans, 2008). Moreover, since podcasts have been used by students to solve their problems such as improvement of their academic achievement, reducing their anxieties, increasing their satisfaction by making up in case they miss the class (Chan & Lee 2005; Cruz & Carvalho, 2006; Miller & Piller, 2005; Tavales & Skevoulis, 2006) we hypothesize:

*H4.a: Perceived usefulness of podcast has a significant positive effect on intention to use podcast.*

*H4.b: Perceived usefulness of podcast has a significant positive effect on perceived relative advantage.*

### **Relative Advantage**

It is the degree to which a new technology is perceived as better than the method or technique used. Convenience and satisfaction are important factors that play important role in leading people to adopt new technology and leave the old method. Usually, what helps individuals to adopt new technology is whether they perceive the innovation as advantageous or not. The higher the perceived relative advantage of an innovation, the faster they will adopt it. Hence we hypothesize:

*H5: Perceived relative advantage has a positive effect on intention to use podcast.*

### **Image**

Image in this study is the extent to which users feel impressed when they use podcast. If users feel by using podcast they get impressed, this will motivate them to enjoy listening and watching podcast on their devices. At the same time, this feeling will lead them to adopt and use podcasts more and more. Based on this discussion, we hypothesize:

*H6.a: Image has a positive influence on Perceived Enjoyment.*

*H6.b: Image has a significant positive effect on intention to use podcast.*

### **Perceived Enjoyment (PE)**

PE is the extent to which the usage of the technology is perceived to be enjoyable for the users apart from any consequences. It was added by Heidjen et al. (2003) to the TAM and demonstrated that it has a big influence on the intention of users to adopt using website.

Moreover previous studies (Davis et al. 1992; Bruner & Kumar, 2005; Pikkarainen et al., 2004) find that perceived enjoyment is an important factor driving technology adoption. Podcasts facilitate “just-in-time” learning where learners can often take advantage of unexpected free time since they frequently have their devices with them (Evans, 2008).

Accordingly, we hypothesize:

*H7: Perceived enjoyment has a positive effect on intentions to adopt podcast.*

## **PROPOSED METHODOLOGY AND DATA ANALYSIS**

The instrument used in this study is based on previously validated measures such as the TAM instrument that was developed by Davis et al (1989); technology self efficacy that was developed by Compeau & Higgin (1995), and others. Prior to data collection, a pilot test of measures was conducted by PhD students. The wording of items was reviewed and modified based on the pilot test outcomes. Overall, the pilot test has shown a high reliability.

In this model, a total of eight constructs were employed, and a total of 41 multiple items with five Likert scale ranging from “Strongly disagree” to “Strongly agree”. The data collected from the survey instrument will be subjected to various statistical tests. The first analysis will test the data for outliers and normality. Outliers arise from four different causes: errors of data entry, missing values, unintended sampling, and non-normal distribution (Cohen, 1969). Outliers can radically alter the outcome of analysis and are also violations of normality. With respect to normality, West et al. (1995) propose an absolute value of two for skewness and seven for kurtosis as maximum limits for satisfactory departures from normality. After assessing outliers and normality, we will compile descriptive statistics, such as the mean and standard deviation, for each variable. Next, a reliability test should be done in order to ensure that the variables in each construct are internally consistent. The reliability test will be checked using the Cronbach’s alpha. Normally the value of the Chronbach’s should be higher than 0.7 in order to get a reliable model.

Later, SEM procedures should be used in order to check the research hypotheses using one of the software AMOS, LISREL etc. for this purpose, first a measurement model using confirmatory factor analysis (CFA) should be built in order to check the model fit and calculate the construct validity. Construct validity is conducted by assessing convergent validity and discriminant validity. Convergent validity shows us that many variables were used to form the construct, while discriminant validity shows us that each construct correlate freely with its items. Finally, the SEM model will be built to check the hypothesized causal paths among the constructs by performing a simultaneous test. This will help us to determine if the presented conceptual model had provided an acceptable fit to the empirical data gathered. In the model fit, we usually look at the chi-square, NFI, NNFI, TLI, IFI, AGFI, and RMSEA. Since the sample data used in this study is not large we can base our decision on its value. The chi-square should not be significant that means the P-value should be greater than 0.05 and its value should be small enough. Also, the other model fits indices such as NFI, NNFI, TLI, IFI, and AGFI should be higher than 0.9 in order to get a good model fit. Finally the RMSEA should be less than 0.08.

**\*\*\*References are available upon request\*\*\***