

Perceived Value of Podcasting: Student Communication-Medium Preferences

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ABSTRACT

Computer mediated communication is rapidly assuming an integral role in the university education experience. This is especially true for auditorium-style classes, which may potentially include hundreds of students. In such classes, the instructor may seek a more efficient means of communicating. The two emerging audio-visual media distribution channels, podcast and webcast augment the existing communication tools, facilitating communication between instructors and students either in a one-to-one relationship or one-to-many, en masse (outside of the classroom). Podcasts are downloadable audio recordings available to listeners through the internet. Webcasts are available as streaming media files. Universities are beginning to recognize the merits of these new technologies, and are experimenting with them in the classroom; instructors are encouraged to podcast announcements, homework assignments, special directions, and even lecture segments. Some instructors have even adopted such techniques as their primary means (within the classroom or outside classroom) of communicating to students. However, the selection of appropriate communication media requires an understanding of the students' perceptions, preferences and receptiveness of these new technologies. The purpose of this paper is to provide an overview of podcasting and webcasting, and to examine student preferences between the different delivery richness of communication media. Background information regarding podcasting and webcasting is discussed. A conceptual model, based on media richness theory, is developed to explain student's perceptions. For the testing of the model, a survey metric is introduced, and a research methodology is explained. Finally a conclusion and research limitations are discussed.

Keywords

podcasting, webcasting, media richness theory, adoption, IT education.

INTRODUCTION

The delivery of information and instruction has been improved by technological developments. Past studies (Callahan, Shim and Oakley, 2000) prove that traditional lectures can be one of the least effective methods of teaching. Studies suggest a multimedia repetition, combined with instructor-led guidance would improve learning retention and acquisition (Braun, 2000; Littman, 1995; Pagell, 1996).

The web has provided an ideal medium to deliver learning material, as digital content that exists in databases can be manipulated by a range of programming services. However, web development has been hampered by bandwidth and difficulties of 'back end integration'. Consequently, the impact of the web to date has concentrated upon the presentational aspects of data and user interfaces. These technical impediments are slowly dissolving, resulting in the opportunity of having

interacting software components that allow non-technical users to author, create and publish materials. Therefore, these technical advances facilitate the emergence of new media such as podcasting, webcasting, videostreaming, blogging, and SMIL technologies (Shim, 2002). These new media streams can be integrated into traditional lectures, thus enhancing the educational environment.

Podcasting has become one of the fastest growing technologies over the past several years. A convergence of broadcast and internet service, podcasting, along with webcasting, is an exemplary case of the pervasive computing technology era. The term 'podcasting' emerged from the combination of the words 'broadcasting' and 'iPod'. Podcasting is differentiated from webcasting with the use of an aggregating RSS (Really Simple Syndication) web feed, or the ability to download and save from a URL. A podcast has a persistent site, capable of synchronizing with a portable multimedia device, such as an MP3 player or iPod, whereas webcasting is streamed from the Internet and requires the user to be connected to the Internet while playing or viewing the webcast files. The current understanding of podcasting is strictly related to audio content and differentiates from video format by introducing terms such as "vodcasting" or "video podcasting" (Wikipedia, 2006). However, podcasting can refer to both audio and video output for a comprehensive understanding.

Podcasting in particular has recently received a great deal of attention from academics and industry practitioners. Many universities are currently evaluating podcasting, and some have launched a variety of programs which utilize the technology. The implications of the podcasting technology are beginning to be realized. For example, the most common current University podcast usage is providing University or department news to staff and students using RSS feed to supplement the traditional paper versions of newsletters. Universities are also utilizing podcasting technology to make guest lectures available to wider audiences, such as staff, students, and alumni who were unable to attend the lectures. (See <http://itunes.stanford.edu>)

Webcasting has been utilized in academia in distance learning, particularly associated with the traditional media production channels. For example, NASA's Digital Learning Network (DLN) aims to deliver content "sharing the knowledge and expertise of NASA scientists, engineers, and researchers with the students in today's classrooms" (<http://education.nasa.gov/divisions/techprodooffice/programs/dln.html>). Unlike webcasting, which generally requires a producer to define and provide content, podcasting has additional means of providing the 'bottom-up' approach, where the media content is localized and defined by a known two-way relationship, i.e. that which exists between students on a course and a particular instructor; the relationship has an aspect of personalization.

The present study will investigate the perceived value of podcasting and webcasting among students. Specifically, one major question is addressed: which factors motivate an individual to adopt podcasts as a communication medium? For this research, this paper will: 1) describe the podcasting technology, 2) discuss current status of podcasting technology and application in the United States, the United Kingdom, and Asia Pacific, 3) develop a research model on the motivational factors which drive individuals to use podcasting over webcasting, and 4) empirically test the conceptual model and the hypotheses.

PODCASTING AND WEBCASTING: OVERVIEW AND CURRENT STATUS

Concepts and Overview

Podcasting is one of the examples of Web 2.0 programs that mark the convergence of broadcast and internet services. The emerging phenomenon cannot be properly evaluated yet, since its impact and significance upon media usage and production process are still in its infancy. Therefore, defining podcasting is a challenge. A study in October 2005, conducted by Yahoo, suggested that only 28% of Internet users were aware of podcasting and only 2% subscribed to podcasts (Grossnickle, 2005). However, there have been observations that a transformation phenomenon is occurring in media usage and its growth is difficult to ignore. A podcast is an enabling personalization of technology, characteristically driven by incremental subject feeds via the web. Due to the nature of the podcasting format (MP3 or MP4 downloads), the downloadable program could reach audiences in a way that traditional broadcasting could not.

It is critical to identify the characteristics of podcasting, and differentiate it from its predecessor, webcasting. Podcasting can be seen as a part of webcasting, since both use internet technology to broadcast both audio and video contents. However, it must be noted that podcasting's associated qualities and characteristics differentiate it from webcasting (Keliher, 2005). The terminology of podcasting may eventually disappear and be categorized in a broader sense of webcasting or even 'mediacasting'. The authors acknowledge this trend but use the term 'podcasting' in this paper to explain the emerging phenomenon and analyze its implications. The term, podcasting may be changed but the phenomenon of the pervasive computing is here to stay.

Characteristics of Podcasting and Webcasting

The universally accepted commercial success of Apple's iPod is closely linked to the development of the term 'podcast'. The term podcasting is gaining its popularity as the broadcasters start adopting and using it widely. However, the assessment of current definitions of podcasting demonstrates that it is inadequate and incomplete; differing usage of the term raises questions about the exact boundaries and the nature of the phenomenon (Keliher, 2005). For example, BBC explains "podcasting is a way to 'subscribe' to radio programs and have them delivered to your personal computer" (<http://www.bbc.co.uk/radio/downloadtrial/>). Their explanation continues to state that podcasting has the ability to provide a subscription to the users even though not every podcasting programs offer such service.

Before identifying the characteristics of podcasting, it must be differentiated from the previously widely used term, webcasting. Although some use the terms synonymously, each technology has distinguishing characteristics (Table 1).

Sources	Definitions
A Dictionary of Business (http://www.oxfordreference.com)	A process in which an online marketer of a product or service sends advertisements or information over the Internet, directly to the desktops of target customers. Companies can also sign on with a webcasting service provider.
A Dictionary of the Internet (http://www.oxfordreference.com)	The use of the WWW for broadcasting material regularly to subscribers.

Table 1. Definitions of Webcasting

Webcasting is closely related to real-time downloading and synchronous broadcasting. Some of the recent examples of webcasting are: 1) a 12-hour live webcast of 'Beyond Einstein'; 2) webcasts of council meetings. It is clear that podcasting is the next stage of webcasting in the continuum of an interactive media development. Podcasting adds spatial flexibility to the temporal flexibility which webcasting offers to create a personally-customizable media environment. Temporal and spatial restrictions are increasingly lifted as podcasting moves further away from the traditional broadcasting environment, which dictates the audience's schedule and timetabling activities. It offers the added control and flexibility of 'when' and 'where', in that the consumer can now download and listen and/or watch the program anytime anywhere, ultimately changing the media experience. The implications of such flexibility have offered the educational environment with 'interactive' communication between instructors and students.

One of the main characteristics of podcasting is RSS. It "lets online users freely subscribe to their choice of content sources across the web. Aggregation tools (e.g., personalized start pages) display summaries of these subscriptions, which update automatically when new information is available. RSS reduces the need for users to visit many individual web-sites" (Grossnickle, 2005). There are also RSS aggregate feeds of audio and video content facilitating users to search the latest services (e.g., Blinkx's new SmartFeed service). Personalization-enabling RSS provides companies with the customer profiling that can lead to direct marketing strategies. Personalization is considered to be one of the key marketing aspects to "further develop customer relationships and heighten brand management" (Agarwal and Sambamurthy, 2002). This personalization characteristic of podcast is considered particularly important for its usage in educational environments where building and maintaining the communication channel between instructors and students is vital. Table 2 shows widely used definitions of podcasting.

Sources	Definitions
Wikipedia (http://en.wikipedia.org/wiki/Main_Page)	Podcasting is the publishing or distribution of radio-style programs on the internet. Podcasts are in MP3 or a similar file format. Podcast producers make their programmes available with RSS feeds.
BBC (http://www.bbc.co.uk/dna/collective/A3847737)	Broadcasters publish digital recordings of radio programs on the internet, which can then be downloaded onto PCs and transferred to portable digital music plays (such as the iPod).
The Oxford Dictionary of English	A digital recording of a radio broadcast or similar program, made available on the Internet for downloading to a personal audio player.

Table 2. Definitions of Podcasting

CURRENT STATUS OF PODCASTING

The United States

The main reason that academic institutions in the United States use podcasting is so that students, who are enrolled in distance learning, are able to have a more personalized connection with the instructor. This allows the instructor to emphasize the information which they feel is most critical for the students to understand. According to the University of Washington faculty and staff newspaper (<http://uwnews.org/uweekarticle.asp?articleID=12921>), podcasting has recently been introduced to augment classroom support, which allows instructors direct control over their podcasts without engaging in the intensive post-production workload that video taping involves. A number of universities are currently using the technology, or are in the late stages of pilot testing. Stanford University is already podcasting approximately 400 audio program channels. Stanford plans to include video files for those with video viewing capabilities. Some salient disadvantages associated with the additional video files would be the additional costs in technical infrastructure, faculty overload, assessments and grades, and copyright issues.

The United Kingdom

Resembling the USA, the UK has a history of distance learning exemplified by the Open University (OU) with over 210,000 students, 100,000 OU students network from their homes or work places. Students access a library of 390,000 audio CDs which provides study aids and resource material (http://www.open.ac.uk/elearning/p2_2.shtml). This provides a rich resource of content resembling the half-way house between webcasting and podcasting. Recently the OU has begun to introduce the podcast technology to utilize their rich content to cater for students who require flexibility. The main advantage here is that the rich media focus is well integrated into the methods used in the production of the courses, and the media rich experience is anticipated by the students. Other UK universities, like the USA, have embraced podcast technology afresh. In recent months they have demonstrated a diversified podcast usage that has the potential to propel the medium into new forms of intercommunication. Universities are piloting podcast usage to support a university news service and provide coverage of guest lectures. The University of Winchester for instance adopted a podcast technology to help dyslexia as a part of dyslexia support and the University of Sheffield produces updates of the changes in the Law for its Law students.

Asia Pacific

Asian countries such as Japan, Korea, and Hong Kong once lagged behind the West in information technology. Despite late development and entry into the market, Asian and Pacific wireless operators have been able to become global leaders. Podcasting is no exception in this regard. Podcasting is already highly utilized within the education and business environments in Asia and Pacific.

CONCEPTUAL FRAMEWORK

This section presents a conceptual model in explaining student's perceptions of webcasting and podcasting (see Figure 1). The model relies on a combination of media richness theory, and media selection theory, as well as several other research

streams. Based on a model previously developed to compare student’s perceptions of email and instant messaging (Chen, Yen and Huang, 2004), the current model is configured to explain the relationship between motivating factors and future usage of podcasting in the academia.

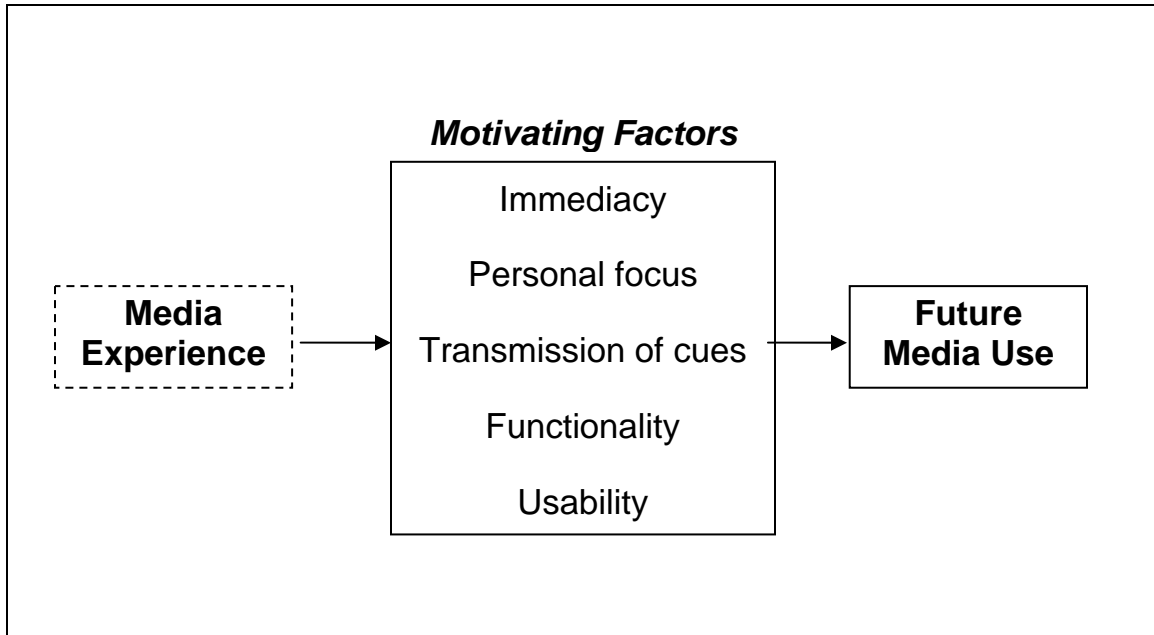


Figure 1. Motivational factors effecting future media use (adapted from Chen et al., 2004)

Media richness plays an important role in determining future media use. In addition to the richness of medium, there are multiple reasons why a given communication medium may be selected, such as availability, costs, or complexity (MaManus, 2002). Several motivations have been posited as determinants of future media use (see Table 3). These factors include immediacy, personal focus, transmission of cues, functionality, usability, and ease of use.

Factor	Source	Description
Immediacy of Feedback	Daft & Lengel, 1986	The extent to which a medium enables users to give timely feedback on the communications they receive.
Personal focus	Daft & Lengel, 1986	The extent to which a medium is viewed as being oriented towards the individual.
Transmission of cues	Daft & Lengel, 1986	The extent to which a medium is able to transmit verbal, nonverbal, and para-verbal cues.
Functionality	El-Shinnawy & Markus, 1998	The extent to which a medium allows a user to send a message that is accurate, comprehensive, and concise.
Usability	El-Shinnawy & Markus, 1998	The extent to which the medium allows a message to be transferred in a “clear and readable format”
Ease of use	El-Shinnawy & Markus, 1998	The extent to which a medium is perceived to be easy to use.

Table 3. Motivating Factors

Based on prior research, the research model of intent to use podcasting is proposed. The research model is illustrated in Figure 2.

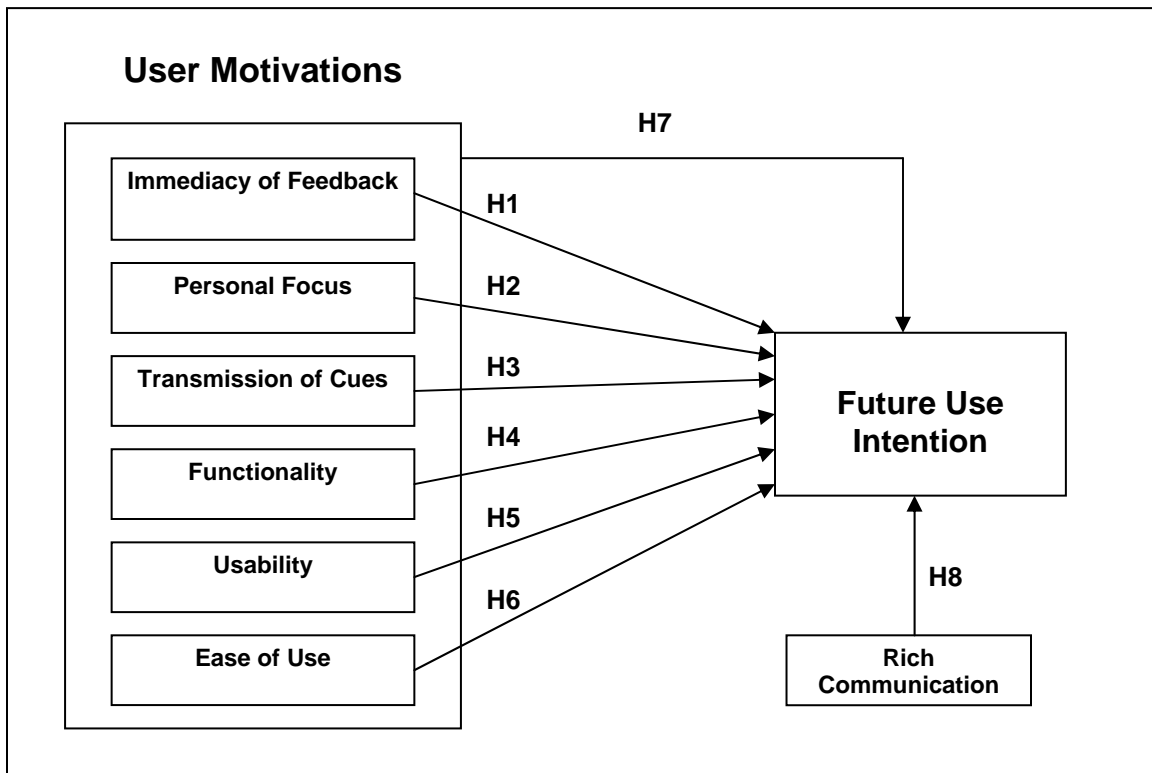


Figure 2. Research Model

HYPOTHESES DEVELOPMENT

The above research argument leads to the following eight hypotheses:

H₁: Immediacy of feedback is significantly related to intention to use podcasting.

H₂: Personal focus is significantly related to intention to use podcasting.

H₃: Transmission of cues is significantly related to intention to use podcasting.

H₄: Functionality is significantly related to intention to use podcasting.

H₅: Usability is significantly related to intention to use podcasting.

H₆: Ease of use is significantly related to intention to use podcasting.

H₇: User motivations are associated with future use intention.

H₈: Users considering podcasting to be a better communication tool will use podcasting rather than webcasting in general.

METHODOLOGY

Sample

To test these research hypotheses, questionnaires were given to approximately 200 students at two major universities in the United States. Of the 200 surveys that were administered, 17 were discarded for incomplete data, with a result of n=183. The sample pool composed of both undergraduate and graduate students from the Colleges of Business and of the Colleges of

Arts and Sciences. Classes selected for inclusion into the study were composed of students who had a fundamental understanding of podcasting (audio and video), and other communication media concepts. All classes that participated in the survey were traditional lecture classes, with no incentives or bonus points issued to students for participation.

Research Instrument

Each participant received a two-page questionnaire on the perceived value of podcasting and webcasting. The first page consisted of information on the survey, podcasting and webcasting definitions, and basic demographic questions. Additionally, three background questions on podcasting experience were also included on the first page. The second page consisted of twelve Likert-scale questions/statements with 5-point response scales. Participants were informed that completion of the survey was voluntary and that their responses would remain anonymous. The survey instrument was adapted from comparative studies on email and instant messaging (Chen et al., 2004), and email and voice mail (El-Shinnawy and Markus, 1998).

Data Analysis

Students were asked to indicate the number of years in which they had been interacted with podcasts. Results of the survey indicated that 43.7% of those surveyed had not used podcasting technology at all, 23.5% had used podcasting for less than one year, 11.5% had used podcasting for one to two years, and 21.3% had used podcasting for more than two years. Therefore, the average time that podcasting had been used by those surveyed was less than one year. Similarly, students were asked to indicate the number of years in which they had used webcasts. Results of the survey indicated that 47.5% of those surveyed had not used webcasting technology at all, 21.3% had used webcasting for less than one year, 10.4% had used webcasting for one to two years, and 20.8% had used webcasting for more than two years. Therefore, the average time that webcasting had been used by those surveyed was less than one year. The third question asked students to rank the uses for podcasts. Figure 3 indicates that of those surveyed, 56.9% listed music as their number one response, followed by educational lectures at 16.1%, news at 10.3%, and sports at 13.8%.

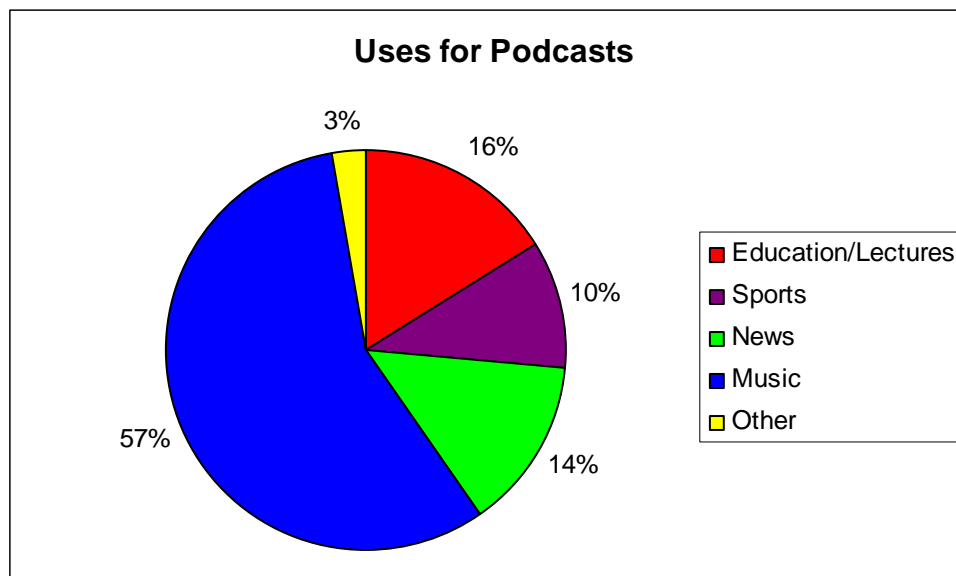


Figure 3. Uses for Podcasts

The next step in the analysis was to perform a linear regression analysis using the dependent variable 'intent to use podcasting technology'. Three of the eight hypotheses tested were supported in this analysis: H2 Personal focus is significantly related to intention to use podcasts, supported at the .002 level of significance; H5 Usability is significantly related to intention to use podcasting, supported by two measures at the .000 level of significance; and H7 User motivations are associated with future use intention, supported at the .006 level of significance. Table 4 shows the coefficients from the linear regression analysis, along with the levels of significance.

Dependent Measures	B	Standard Error	Beta	t	Significance
Podcasts are more useful for class assignments than webcasts	.404	.068	.371	5.866	.000
I believe that podcasts would be helpful in improving my course learning experience	.284	.057	.306	4.946	.000
Podcasts feel more personal than webcasts.	.189	.060	.183	3.133	.002
On future assignments, I will use webcasts more than podcasts	-.148	.053	-.147	-2.771	.006
I believe that podcasts will eventually replace class lectures in the future	.100	.049	.114	2.015	.045
Note: Linear regression performed with dependent variable – intent to use podcasts					

Table 5: Coefficients Table

Finally, the third phase in the analysis involved clustering responses into groups based on responses to the first two questions indicating podcasting and webcasting use. Dummy variables were created and coded as 0 for non-user and 1 for user. Respondents could be categorized as podcast users, webcast users, both or neither. A logistic regression analysis was performed with 'podcast use' as the dependent variable and then again with 'webcast use' as the dependent variable. The following results were found at a 90% confidence interval. As one might expect, podcast users were found to use podcast technology frequently and believe that podcasts assist with classroom assignments more than webcasts. Interestingly, webcast users were also found to believe that podcasts assist with classroom assignments more than webcasts and that podcasts convey large amounts of information faster than webcasts. Webcast users were also found to believe that podcasts are more useful than webcasts and say that with future assignments, they intent to use podcasts more than webcasts. Therefore, H8: Users considering podcasting to be a better communication tool will use podcasting rather than webcasting general, is supported at the .100 level of significance. Table 5 shows the four hypotheses that were supported and the four that were not supported from both the linear regression and logistic regression analyses.

Hypothesis Number	Hypothesis Description	Finding
H ₁	Immediacy of feedback is significantly related to intention to use podcasting	Not supported
H ₂	Personal focus is significantly related to intention to use podcasting.	Supported
H ₃	Transmission of cues is significantly related to intention to use podcasting.	Not supported
H ₄	Functionality is significantly related to intention to use podcasting.	Not supported
H ₅	Usability is significantly related to intention to use podcasting.	Supported
H ₆	Ease of use is significantly related to intention to use podcasting.	Not supported
H ₇	User motivations are associated with future use intention.	Supported
H ₈	Users considering podcasting to be a better communication tool will use podcasting rather than webcasting in general.	Supported

Table 4: Research Results

CONCLUSION

Although podcasting is not without minor problems, it has many beneficial qualities including students' familiarity with the new technology, and the cost effectiveness in the long run. In other words, the benefits of adopting podcasting outweigh the disadvantages and problems associated with the podcasting. The authors believe that podcasting technology should not be seen as a tool to replace traditional classroom teaching of fundamental principles. Rather, it should supplement class materials, so that students can better understand concepts, theories, and applications that may not have been available during the class. One of the most salient limitations identified in the study is the narrow focus of questions included in the survey. There were not any questions on cost or availability included in the study, although these are potentially significant variables.

Podcasting is a simple way for marketers to communicate with their target customers. It is a unique PR tool for major corporations, and start-ups. Podcasting's ease of use combined with the ever-increasing demands upon time and money will make its use continue to grow in academic, industry, and wider social settings.

The conceptual model of the motivations to use podcasting was adopted from media richness theory. It was proposed that six factors are related to future media use; immediacy of feedback, personal focus, transmission of cues, functionality, usability, and ease of use. The methodology relied heavily on logistic regression analysis for testing the various hypotheses. The authors collected data for hypothesis testing. The results of the study were inconclusive. This may be due to the lack of user experience with podcasting.

Research Instrument available upon request

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