THE USE OF WEB 2.0 TECHNOLOGIES IN MARKETING CLASSES: KEY DRIVERS OF STUDENT ACCEPTANCE

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ABSTRACT

With the proliferation in Web 2.0 technologies, many marketing educators are experimenting with new teaching and learning tools (e.g., Facebook, Twitter, YouTube, Second Life). The benefits of such technologies are often touted by scholars, and indeed there is a good deal of evidence to support such a view. However, increasingly educators are highlighting some of the limitations of technology in the learning environment. To draw parallels with other new product research in marketing, the adoption of new learning technologies is often not so widespread. The literature exhibits inconsistency about the willingness of students to adopt new technology in a learning environment but no systematic research yet exists into the factors that affect technology acceptance. This research fills a gap in the literature by applying an augmented Technology Acceptance Model (TAM) to understand students' future intentions to adopt Twitter, a Web 2.0 technology shown to offer students a variety of benefits. Using Partial Least Squares the research shows the main proximal driver of student adoption of Twitter is utilitarian attitude. Students need to be convinced about "what's in it for me?", rather than persuaded about the technology's hedonic benefits. Other affective variables such as an individual's affinity with computers and risk tolerance were also found to be important drivers of perceived ease of use and perceived usefulness, the TAM's key antecedents.

Keywords: Twitter, Technology Acceptance Model (TAM), attitudes, Web 2.0

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TECHNOLOGY AND EDUCATION IN BUSINESS SCHOOLS

A recent special issue in the *Journal of Consumer Behaviour* (Page and Pitt, 2011) highlights the range of ways in which consumers' interactions with organisations are changing. This is becoming more and more apparent within the domain of marketing education too. As Web 2.0 technology proliferates and becomes more diffused among the population, educators have increasingly begun to experiment with new ways of communicating with students, rethinking conventional approaches to student learning (Granitz and Pitt, 2011). Much of this research has focused on understanding how these technologies affect learning outcomes, rather than on *use* of such technologies (a notable exception includes work by Peltier, Schibrowsky and Drago, 2007). For example, recent research has examined the use of blogs as assessed items in marketing courses (Kaplan, Piskin and Bol, 2010), the use of YouTube to acquire knowledge on viral marketing (Payne, Campbell, Bal and Piercy, 2011), the use of Twitter as a way to enhance learning outcomes in a marketing course (Lowe and Laffey, 2011; Rinaldo, Tapp and Laverie, 2011), the development of "Wikis" to create interactive textbooks (Pitt et al., 2009; Cronin, 2009), the use of SMS messages to enhance and support student experiences (Jones, Edwards and Reid, 2009), and the use of Virtual Learning Environments (VLEs) to create interactivity and responsiveness in the learning environment (Paladino, 2008). Most of these innovative approaches to student learning have met with some degree of success, arguably because students are key users of social media (Lenhart, Purcell, Smith and Zickuhr, 2010) and typically these technologies are attributed with enhancing experiential learning and the development of "soft skills". Furthermore, academic research conducted in conjunction with Cengage Learning, one of the world's largest publishers, shows that many students are expecting instructors to use a range of new and innovative forms of technology within the learning environment (Buzzard, Crittenden, Crittenden and McCarty, 2011). However, much needs to be done to enable higher education institutions to respond to a changing online learning environment, and scholarly work aimed at understanding students' use of, and interaction with, new Web 2.0 capabilities is a pressing area of concern (Kukulska-Hulme, 2010). Despite providing many advantages to classroom learning, little is known about key drivers of social media and technology acceptance within the learning environment.

These challenges to educators' are not entirely new, and indeed the debate about online technologies has moved away from the growth of online education, to the form that it will take (Peltier, Schibrowsky and Drago, 2007). Understanding the *acceptance* and *use* of different Web 2.0 technologies is important in addressing this issue. Despite a plethora of research in more commercial settings, and some insightful work in the area of student perception of online learning effectiveness (e.g., Peltier, Schibrowsky and Drago, 2007), social media and Web 2.0 technologies have only recently begun to be studied within a higher education setting.

With rapid adoption of Web 2.0 technologies among the student population (Lenhart et al. 2010), it would seem pertinent to evaluate the factors driving the acceptance and use of such technologies amongst students in the learning environment. Though extensive research has examined the adoption issues of online education more generally (Peltier, Drago and Schibrowsky 2003; Peltier, Schibrowsky and Drago, 2007), and recent research has begun to look at the effect such Web 2.0 technologies have on learning outcomes (e.g., Gao, Luo and Zhang, 2012; Kaplan, Piskin and Bol, 2010; Lowe and Laffey, 2011), very little research has addressed how students interact with and *use* such technologies as a tool to engage with course content. While the traditional assumption is that incorporation of technology into the classroom is beneficial and that students want a more technologically sophisticated learning experience (e.g., Hunt, Eagle and Kitchen, 2004), more recent research has begun to question this view (Clark, Yates, Early and Moulton, 2009).

Consequently, this research begins to address this gap by illustrating, through an augmented Technology Acceptance Model (TAM), the variables that are important in explaining students' intentions to adopt Twitter as a learning tool within business courses. Extending the conventional TAM, this research contributes to the literature by further incorporating emotional variables and examining hedonic, as well as utilitarian evaluations of Twitter as a learning tool. We begin by examining the role of technology within the learning environment, and then provide an overview of the TAM, and the extended conceptualization. Specifically, this research contributes to the field of consumer behaviour and business education by i) augmenting the TAM to a new and important context, and ii) highlighting the key drivers of student adoption of learning technologies, with evidence based on the use of Twitter in marketing courses.

TECHNOLOGY IN THE CLASSROOM

The use of technology to augment learning within the classroom is not new, and as new advances have been made, new learning techniques have been experimented with. More recently, the emphasis has been on experimentation with Web 2.0 technologies (e.g., Twitter, YouTube, Second Life and other Web 2.0 technologies – see Granitz and Pitt 2011, for example). While many studies claim a variety of benefits from the use of such technologies (e.g., Clarke, Flaherty and Mottner, 2001; Cronin, 2009; Kaplan, Piskin and Bol, 2010; Lowe and Laffey, 2011; Payne, Campbell, Bal and Piercy, 2011; Pitt et al., 2009; Rinaldo, Tapp and Laverie, 2011), the adoption of technology in the classroom has been constrained by a variety of factors (as with most new products), and students and staff reactions to different technologies have been negative as well as positive (Buzzard, Crittenden, Crittenden and McCarty, 2011; Peterson, Albaum, Munuera and Cunningham, 2002; Sharples, 2007). For example, Hortsmanshof (2004) and Kukulska-Hulme (2010) suggest that the adoption of such technologies can place further burdens on staff in terms of time because new communication channels are added. This reflects a degree of scepticism by academics – the ultimate gatekeepers of technology use in the classroom – about the usefulness of some teaching innovations relative to their costs. Recent research into academics' perceptions of Web 2.0 within the higher education learning environment supports this assertion (Kukulska-Hulme, 2010). Specifically, Brown (2012) finds that 20% of respondents indicated that Web 2.0 had no useful role to play in the academic learning environment and does not add value to the learning environment. However, the findings here were based on a small sample (n=49), and, given the nature of the study, one may expect participants with strong positive views about Web 2.0 to be more likely to participate. This may indicate the number could be even higher.

Likewise, drawing on earlier research, Oliver (1996) suggests technology can place further burdens on students by increasing their cognitive load. Research has also pointed to the steep learning curve associated with the adoption of new technology in the classroom (e.g., Cavanaugh, 2004). Several studies report the adoption of different types of technologies to be lower than what might be expected. For example, Strauss and Hill (2007) illustrate over 50% of marketing students do not embrace web-based instructional tools for the purposes of learning. Similarly, Oradini and Saunders (2008) report only a small core of students engaging with a new form of internal university social media called Connect, and identify significant take up issues by staff and students alike.

In the most comprehensive study to date on students' preferences and use of a range of technologies in the learning environment (Buzzard, Crittenden, Crittenden and McCarty, 2011), the evidence is more mixed and indicates that reported findings might obscure differences in preference and usage between disciplines. For example, it was found that preferences for technology use in the learning environment were highest for engineering and business students and lowest for arts and humanities students. Likewise, the authors' also found that about 68% of students used social networking, and about 50% of students felt that social and interactive technologies were effective in the learning environment. Therefore, in light of the number of studies which show the learning benefits of various Web 2.0 technologies, and the contradictory evidence about student adoption of such technologies, it is pertinent to use theory about innovation adoption to understand use of such technology in the classroom.

THE BENEFITS OF USING TWITTER AS A LEARNING TOOL IN BUSINESS COURSES

Twitter is a simple social networking tool designed to let users communicate "what am I doing now?" by tweeting. Followers then follow the tweets that interest them by signing up to the service. Though the restrictions on the length of the tweet (140 characters) have often been touted as a restriction, users are able to augment tweets with shortened URLs using services such as http://bit.ly and http://tiny.cc/. The use of web shorteners means Twitter is no longer constrained by the 140 characters per tweet. For example, one may tweet "Yet another case of marketing myopia? http://bit.ly/i9T8di" This tweet was in relation to recent profit warnings by the music store HMV and raised a variety of in-class discussion issues.

Twitter has grown rapidly since 2009 (Google Trends, 2013) and is within the top 10 most visited websites. Twitter is used extensively by individuals and celebrities to communicate concise and timely nuggets of information with others. More recently, academic research has begun to understand the benefits of Twitter through qualitative and quantitative research procedures (e.g., Cann et al., 2009; Kassens-Noor, 2012; Junco, Heiberger and Loken, 2011; Lowe and Laffey, 2011; Rinaldo, Tapp and Laverie, 2011), and through literature review (Gao, Luo and Zhang, 2012). In general, based on a systematic literature review of twenty one studies, Gao, Luo and Zhang (2012) find that micro-blogging encourages participation, reflective thinking, and greater engagement between students and the learning material. Lowe and Laffey (2011) report additional benefits such as conciseness, convenience, non-intrusiveness and the ability to learn subject related information. Likewise, Rinaldo, Tapp and Laverie (2011) report more general benefits including personal involvement, course satisfaction, career preparation, ability to attain traditional educational goals, and efficient use of time. These findings are commonly based on the use of self-reported data. However, recent studies report similar findings from experimental procedures. Specifically, Twitter seems to have a positive impact on student learning (Kassens-Noor, 2012), engagement and performance achievement (Junco, Heiberger and Loken, 2011).

Twitter is becoming an increasingly popular tool among business academics too. For example, one online magazine has a list of the "top 100" marketing academics around the world who tweet (Huffman, 2011). Presumably many more marketing academics use Twitter actively within their courses as this list represents only the most prolific tweeters. Veletsianos (2012) provides a comprehensive understanding of how scholars use Twitter through a content analysis of the Tweets of 45 scholars. Specifically, it was found that scholars used Twitter to share information about course content and professional practice, provide advice to others and seek advice from others, engage in social commentary and identity management, and seek more extensive social connections with individuals. Twitter is also used by many global brands, so can be used for pedagogical benefit to teach marketing concepts. Therefore, Twitter provides a variety of learning benefits to the marketing academic which may explain its widespread usage.

A natural question one might ask is “why can’t I just email students?” or “why can’t I use Facebook which allows status updates and a more comprehensive service?” In an educational setting, Lowe and Laffey (2011) discuss the advantages and disadvantages of using Twitter, in relation to other forms of social media. These include its conciseness, speed, timeliness, spontaneity, robustness and the fact that Twitter is less likely to cross other social boundaries. Twitter has the convenience and flexibility of an SMS message, but is robust enough to link out to other external information globally and in real time (including websites, journal articles, advertisements, pictures and anything else that is available on the Web). It is also convenient, time-efficient and need not be socially intrusive. However, despite its benefits, the adoption of Twitter within the classroom, as with other learning technologies, shares obvious analogies to the adoption of any new technology. For example, some students might perceive it to be low in relevance to the module they are taking, or not sufficiently beneficial to warrant embarking on a new learning curve. Others may feel some degree of anxiety over the adoption of Twitter as technologies often present consumers with some degree of increased perceived risk. As such, it would be pertinent to apply existing theories of technology acceptance to the adoption of Twitter within the learning environment so we can better understand what factors and barriers are influencing its acceptance.

THE TECHNOLOGY ACCEPTANCE MODEL

The TAM (Davis, 1989) is a highly cited model for predicting users’ intentions to accept new technology, and we use this framework here. Though initially applied to predict the acceptance of information technology within an industrial context (e.g., user acceptance of new information technology interventions adopted within organisations), the model has been shown to be relatively robust across a variety of situations and contexts (e.g., see Legris, Ingham and Collerette, 2002 for a critical review). Increasingly the TAM has been applied to a variety of consumer contexts (sometimes known as c-TAM). For example, the TAM has been used to predict consumers' acceptance of personal computers (Venkatesh and Brown, 2001), handheld internet devices (Bruner and Kumar, 2005), internet banking (Lai, 2005), online auctions (Stern et al., 2008), sensory enabling technologies (Kim and Forsythe, 2008), e-service systems (Lin, Shih and Sher, 2007) and a plethora of other consumer products and services. The TAM's appeal and widespread usage, seems to be based around its intuitiveness, simplicity, empirical validation and robustness across a variety of technology contexts.

Based on the Theory of Reasoned Action (Ajzen, 1988, 1991), the TAM predicts that intentions to use a technology are dependent upon two key factors; perceived usefulness of the technology and perceived ease of use. Perceived usefulness is the user's evaluation of how useful a particular technology is, and perceived ease of use relates to the user's evaluation of how easy it is to apply the technology to a specific task. Perceived ease of use is closely associated with perceived usefulness. According to Davis' (1989) original manifestation of the TAM, perceived usefulness and perceived ease of use lead to changes in attitude towards the behaviour of adopting, as a proximal consequence, and actual usage as the end variable.

Though the TAM may be criticized for being too general, it is useful in exploratory situations because testing and confirming the impact of the key antecedents enables further testing of the factors driving those antecedents in any particular context. Therefore, to provide a basis for the research model we first replicate three key hypotheses from the literature in relation to perceived usefulness, perceived ease of use and usage intention. Following prior research on technology acceptance we would expect that higher levels of perceived usefulness would lead to greater usage intention. There is support for this with respect to new learning technologies too. For example, research into Twitter (Dabner, 2012) and other social networking sites (Oradini and Saunders, 2012) highlights the importance of a perceived relative advantage in the decision for students to engage with a new technology in the learning environment. Other research into Twitter (e.g., Lowe and Laffey, 2011) highlights the learning benefits associated with its use.

It may also be the case that students need more direction than instructors anticipate because some Web 2.0 technologies can be complex to use, or at least may be *perceived* by students to be complex to use (Buzzard, Crittenden, Crittenden and McCarty, 2011). This is consistent with Peltier, Schibrowsky and Drago (2007) who illustrate the importance of reducing technology problems (as a key driver of student satisfaction), and the importance of facilitating the ease of communication between students and staff. Furthermore, as with prior research (Davis, 1989), we would expect perceived ease of use to also drive perceived usefulness, because if a technology is easier to use it is also more useful. Consequently, if instructors facilitate making it easier for students to understand how to use a technology, it is more likely that this technology will be perceived as useful to students if it also enhances other aspects of the student's experience, such as increased engagement and interaction with the learning material in a timely manner. Specifically we begin by proposing the following:

H_1: *The greater the perceived usefulness, the greater the usage intention*

H_2: *The greater the perceived ease of use, the greater the usage intention*

H_3: *The greater the perceived ease of use, the greater the perceived usefulness*

We also extend existing research (e.g., Stern et al,. 2008) by looking at students' hedonic and utilitarian attitudes towards the adoption of Twitter in class to more comprehensively examine their cognitive and affective reactions towards Twitter as a class room technology to facilitate learning. Including these variables will provide a richer prediction of consumers' attitudinal response. A similar approach has been adopted by Yang and Yoo (2004) who examine an extended TAM by incorporating affective and cognitive attitudes. However, in an *organisational setting* they find that affective attitudes do not explain information system use. Based upon the discussion above, this would be largely predicted. However, based on Stern et al.'s (2008) conceptualisation we believe that the importance of affective attitude on usage intentions will increase for the adoption of Twitter by individual students. Specifically, we anticipate that perceived usefulness is positively associated with utilitarian attitude and hedonic attitude, and that perceived ease of use is positively associated with utilitarian and hedonic attitudes. Thus, hedonic and utilitarian attitudes mediate the relationship between perceived usefulness and future intentions, and perceived ease of use and future intentions. Perceived usefulness and perceived ease of use are also directly associated with future intentions, as are utilitarian and hedonic attitudes. Consequently we advance the following hypotheses:

H_4: *The greater the perceived usefulness, the greater the a) utilitarian attitude, and b) hedonic attitude*

H_5: *The greater the utilitarian attitude, the greater the usage intention*

H_6: *The greater the perceived ease of use, the greater the a) utilitarian attitude, and b) hedonic attitude*

H_7: *The greater the hedonic attitude, the greater the usage intention*

Stern et al. (2008) address calls in the literature (e.g., Bagozzi, Davis and Warshaw, 1989;

Venkatesh and Davis, 2000) to investigate and comprehensively test TAM's antecedents by enhancing the TAM with affective variables, including risk tolerance, computer affinity and impulsiveness. Such variables are particularly relevant to the consumer context, rather than the organizational context, because in organizational settings where an organization has already adopted the technology, *users* are more likely to be affected by cognitive variables such as perceived usefulness and perceived ease of use – their task is to use a technology already adopted by their organization – and less likely to be affected by emotional variables. In contrast, a consumer adopting a new technology is likely to be affected by cognitive variables as well as affective variables. However, little research has examined the effect of affective variables in consumer adoption decisions. The incorporation of affective variables is also appropriate as it allows for heterogeneity within the sample,.

In this model, affinity to use the computer is defined as the degree to which an individual has a positive feeling towards the use of computers. We expect that those consumers who have a higher degree of computer affinity are also more likely to find the technology useful, and are more likely to find it easy to use. This is intuitive to some degree, but is also supported by other literature on learning technology (Laru, Naykki and Jarvela, 2012) which finds that students who interact with other technologies are more likely to be active blog users. Risk tolerance is an individual's willingness to take on higher levels of risk. Impulsiveness is a trait that reflects an individual's tendency to act without adequate forethought and relates to a consumer need for stimulation within the decisions they make (Rook and Fisher, 1995). We expect that higher levels of risk tolerance are associated with higher perceived ease of use and higher impulsiveness. These predictions are consistent with those of Stern et al. (2008). Our extended conceptualisation of the TAM for the use of Twitter is shown in Figure 1.

H_8: *The greater the affinity with a computer, the greater the a) perceived usefulness, and b) perceived ease of use*

H_9: *The greater the risk tolerance, the greater the a) perceived ease of use, and b) impulsiveness*

H_{10}: *The greater the impulsiveness the greater the usage intention*

Please insert Figure 1 about here

METHOD

We implemented the project in two postgraduate marketing courses and two undergraduate marketing courses. The use of Twitter in the course was explained to students and students were asked to take part voluntarily. For the remainder of the course those students that agreed to take part followed tweets from the module convenor and tweeted themselves too. The tweets were designed to i) alert students to relevant, recent marketing events (e.g., "Issues with brand management and distributors: Kraft and Starbucks http://bit.ly/eSvSd3"), ii) to disseminate further information on contemporary marketing issues (e.g., "How Pepsi plans to take on Coca-Cola - a societal marketing approach: http://econ.st/gEQHpe"), iii) disseminate timely examples of key concepts discussed in class (e.g., "The marketing environment and pricing: http://bit.ly/gQHNht Shows importance of social aspects of marketing"), and iv) raise issues outside of class that could be discussed at a later date (e.g., "User generated ads – will draw on this on Tues http://bit.ly/eZ6hbZ"). There were about four tweets per week on average. After several weeks of tweeting to the class we then sought to examine student perceptions of Twitter using an augmented TAM (Davis, 1989), following Stern et al. (2008).

Participation in the use of Twitter was voluntary, rather than compulsory, for three main reasons. Firstly, studies which have made participation compulsory have noted very low participation rates. For example, in Ebner's (2009) study only 7% of students actively contributed via tweeting. The results are similar in Ross, Terras, Warwick and Welsh (2011), and Kop (2011) where active contribution was 23% and 9% respectively. Secondly, because Twitter is a system external to the University, and users can create their own names (or may have their own names with existing accounts), it is difficult and time consuming to monitor participation. Thirdly, as this was a study about students' perceptions of adopting Twitter, we felt that it was important to capture a cross-section of adopters and non-adopters and their perceptions about the reasons they did or did not want to adopt Twitter.

MEASURES

Measures. Students were asked to respond to questions about future intentions to use Twitter (FI), perceived usefulness (PU), perceived ease of use (PEOU), risk tolerance (RT), affinity towards computers (AFF), and impulsiveness (IMM). Measures of the core constructs from the conventional TAM (i.e., FI, PU and PEOU) were based around existing measures from the literature (e.g., Stern et al., 2008; Venkatesh and Davis, 1996) and were Likert scales anchored from 1 (strongly disagree) to 7 (strongly agree). Measures of the constructs used to augment the conventional TAM (i.e., RT, AFF and IMM) were also based around existing measures from the literature (e.g., Raju, 1980; Stern et al., 2008; Weun, Jones, and Beatty, 1997) and were Likert scales anchored from 1 (strongly disagree) to 7 (strongly agree). Hedonic and utilitarian attitudes (HdATT and UtATT) were measured using Voss, Spangenberg and Grohmann's (2003) HED-UT scale, which consisted of five semantic differentials for utilitarian attitude and three semantic differentials for hedonic attitude (Items can be viewed in Table 1).

Common Method Bias. In cross-sectional research Common Method Bias has been identified as an important source of systematic error (Podsakoff, MacKenzie, Lee and Podsakoff, 2003). We tried to minimize any potential threat to validity by following the pragmatic suggestions outlined in Podsakoff et al. (2003). For example, measures of the constructs were included using different response formats. In the introductory statement we also assured respondents that their responses would be anonymous, that there were no right or wrong answers, and that no identifying information would be used, other than to allocate prizes for taking part. The Harman single-factor test was also used to test for the existence of CMB. Thus, a principal components analysis with a Varimax rotation was run on all measurement items. Eight different factors were identified from the unrotated factor solution (with eigenvalues greater than 1.0) and factor 1 accounted for 32% of the variance. All eight factors with eigenvalues greater than 1.0 accounted for 77% of the variance. Therefore, there was no significant evidence of CMB.

SAMPLE

The sample consisted of 144 students from two marketing courses at postgraduate level and two marketing courses at undergraduate level within a metropolitan university. Gender was relatively evenly represented and ages ranged from 20 to 41 with a median age of 25.

ANALYSIS AND FINDINGS

Table 1 shows the measurement properties of the major scales of the study. Alpha reliabilities averaged .97 and ranged from .95 to .98, all above Nunnally and Bernstein's (1994) recommended level of .7, suggesting good internal consistency. The average variance extracted (AVE) for all measures were above the criteria of .50 (see Fornell and Larcker, 1981). The composite reliability measures, similar to the construct reliability measures of Bollen (1989), showed that each latent construct was well represented by the observed measures and ranged from .91 to .98 and averaged .94. Communality measures were all above the acceptable level of .50 for each latent variable (Fornell and Larcker, 1981).

The data were analysed using Partial Least Squares (SMART-PLS2.0) (Ringle and Alexander, 2005). This included validating the measurements and testing support for the hypotheses of interest. Partial Least Squares (PLS) is a component based structural equation modelling technique that has particular advantages over covariance modelling (Slotegraaf and Dickinson, 2004). Among the many advantages of PLS are outer model formulation which allows for the specification of both reflective and formative modes, as well as categorical variables. It can also be used with smaller sample sizes, unlike conventional structural equation modelling. PLS is not constrained by identification issues, even in complex models (Hair et al., 2012). PLS has also been found to deal with issues such as CMB more effectively because it estimates latent variables "as exact linear combinations of the observed measures. It conversely holds the potential for detecting or controlling for CMB's influence on estimates and/or constructs (regardless of the CMB's form) without changing the modelling assumptions" (Chin, Bennett and Wright 2012, p. 1007). PLS uses standardized data to calculate latent variable scores, and outputs such as path loadings, are standardized (Hensler, Ringle and Starstedt, 2012).

Maximization of variance explained (or R^2 values), in all dependent variables is the primary objective of PLS (Hulland, 1999). There is a wide application of PLS in many areas of the marketing literature (Hair et al., 2012) and it has been suggested that PLS is particularly useful for analysing TAMs (Moores, 2012; Luo et al., 2011; Pousttchi & Goeke, 2011; Saad, 2007). Recent research suggests that PLS provides accurate descriptions of complex models with both normal and non-normal data as does LISREL (Goodhue, Lewis and Thompson, 2012). As shown in Figure 2, support was found for Affinity with the computer, predicting Perceived Ease of Use (β=.50, p <.01), and for Affinity with the computer predicting the Perceived Usefulness of Twitter (β=.18, p <.05). Perceived Ease of Use was found to predict strongly Perceived Usefulness of Twitter (β=.75, p <.01). Perceived Usefulness in turn was found to predict well future intentions of using Twitter (β=.55, p <.01). Perceived Ease of Use was also found to be related to future intentions of using Twitter, (β=.21, p <.05). Utilitarian (β=.24, p <.05), rather than Hedonic Attitude (β=.06, p >.05) to using Twitter in a learning environment, predicted the intention to use Twitter again in the future. Perceived Usefulness, though was found to strongly predict Utilitarian Attitude of Twitter in a learning environment by students (β=.68, p <.01). Perceived Ease of Use also predicts Utilitarian Attitude (β=.30, p <.01), but not to the same extent as Perceived Usefulness. Hedonic Attitude is predicted by Perceived Usefulness (β=.45, p <.01), but not by Perceived Ease of Use (β=.06, p >.05). Hedonic Attitude also predicts Utilitarian Attitude (β=.54, p <.01) consistent with Voss et al's. (2003) conceptualization of the constructs, and illustrates validity of the measures employed here. Risk Tolerance predicts Perceived Ease of Use (β=.37, p <.01) and Perceived Ease of Use predicts Impulsiveness (β=.73, p <.01). However, Impulsiveness does not predict future intention (β=.06, p <.01).

The model predicts well future intentions to use Twitter again in a learning environment (r^2=.92). The model's antecedents also provide good explanatory power for Utilitarian Attitude (r^2=.90) and Hedonic Attitude (r^2=.84). Perceived Usefulness (r^2=.81) and Perceived Ease of Use (r^2=.68) are also predicted well by the model, but not so well for Perceived Ease of Use. To summarize, based on the PLS results, the extended TAM model presented in Figure 2, predicts well current attitudes to the use of Twitter in a learning environment and future intended use of this social media, if available in future courses. There is also overall support for the conventional TAM, validating it in an additional context.

Please insert Table 1 about here

Please insert Figure 2 about here

DISCUSSION, AND IMPLICATIONS FOR THEORY AND PRACTICE

IMPLICATIONS FOR THE USE OF TECHNOLOGIES WITHIN THE LEARNING ENVIRONMENT

The findings here illustrate the key drivers of acceptance of Twitter in a learning environment context, amongst business students. This model may be applied to a range of different learning technologies. Given it highlights the importance of perceived usefulness and perceived ease of use in predicting acceptance, the implication is that instructors experimenting with a new learning technology can enhance adoption by students through understanding what factors are most likely to influence perceived usefulness, perceived ease of use and the key individual difference variables such as computer affinity and risk tolerance. These factors will vary by context but the model tested here provides a robust framework through which instructors can understand i) how to influence the adoption of such technologies in class, and ii) whether or not a new idea for a technology is going to be taken up by students.

Specifically, one key practical implication from this research is that utilitarian attitudes are the most important proximal antecedent of future intentions. In the context presented here, the link between hedonic attitudes and future intentions was not significant, suggesting that decisions to use Twitter as a learning technology are based primarily on the notion of "what's in it for me?", rather than "wow! that's cool". This is consistent with the findings from Dabner (2012, p. 76) who states "…students use social media for their own purposes and will engage with it when they perceive advantages for doing so." Thus, when trying to enhance adoption of a new learning technology, educators' would be best advised to focus their efforts on promoting the tangible learning benefits of the technology to students (e.g., how it is going to help them, how effective it will be in enhancing their learning, how practically useful it is), rather than focusing their efforts on the softer hedonic benefits (e.g., how fun and how enjoyable it is); the "fun" element does not appear to be as important to students. Likewise, it should not be assumed that students will continue to adopt Web 2.0 technologies in the learning environment: the benefits to them of engaging in Web 2.0 technologies need to be communicated. As illustrated by prior research, it is also important to understand the heterogeneity that exists across consumers. Specifically, the other affective antecedents seemed to augment the model with affinity towards computers sharing a positive relationship with perceived usefulness and perceived ease of use, and risk sharing a positive relationship with perceived ease of use. This implies that Twitter might be more relevant for disciplines where the cohorts are more computer friendly. Buzzard, Crittenden, Crittenden and McCarty (2011) touch on this issue with their large scale survey into the use of digital technologies by university students and professors, and find that preferences for technology are lowest within the humanities (37%), education (46%) and the fine arts (47%). On the other hand, preferences for technology in the learning environment are highest for engineering (73%), business (66%) and the physical sciences (61%). Consequently, it might be more effective to trial the use of new technologies within certain disciplines to account for heterogeneity in the student population. This is consistent with one of the author's anecdotal experiences. When conducting a seminar for graduate students and academic staff on incorporating technology into the classroom, one of the more advanced students (a history professor) in the class made a particular point of saying how other less technologically inclined colleagues, and students from her modules, had refused outright to use any Web 2.0 technologies in class.

The effect of risk on perceived ease of use is potentially important to students' adoption decisions and may reflect the presence of a psychological barrier in the adoption of learning technologies by students. For example, Twitter is in fact a relatively simple technology to use, but if individuals happen to be more risk averse, its simplicity, and value in a learning context, may be lost on them because it influences their perceived ease of use which in turn influences adoption. Therefore, educators' need to try and minimize the factors likely to increase perceptions of risk. This might involve an in-class demonstration of how to use Twitter, a short Twitter briefing, and other methods designed to assure students of Twitter's ease of use. The findings here are consistent with the study conducted by Buzzard, Crittenden, Crittenden and McCarty (2011), who find a disconnect between what instructors *think* they know about students' technology use, and the degree to which students actually use technology within the learning environment. Specifically, they find students might need more training and support in the use of various instructional technologies than they currently receive, and students tend to expect more support than is provided. However, with respect to Twitter, we expect this effect to weaken over time as Twitter diffuses amongst the population in general. Though the implication is that including risk within the model is likely to be an important antecedent to adoption decisions for learning technologies in general, we speculate it will become more important as an individual's perceived degree of newness increases.

Having used Twitter in class over a number of years we can also present some practical applications to stimulate use in the learning environment. Twitter can be drawn on in lectures in a number of ways. Each lecture can have a list of relevant twitter feeds and can also draw on Twitter to see how organisations use it in their marketing. A live module Twitter feed can also be made available on screen during lectures to encourage students to tweet making the lecture an interactive process. This does, however, have dangers of anti-social behaviour which educators need to be aware of. External experts could also be encouraged to offer their thoughts on such a feed widening the possibility of industry involvement as a manager could tweet without any other disruption to their working day. Twitter can be used creatively in the coursework process in a number of ways too. Students can be asked, for example, to compare the use of Twitter in a selected area, such as sales or customer service, by competing organisations making links between theory and practice.

IMPLICATIONS FOR RESEARCH IN CONSUMER BEHAVIOR

Despite finding that hedonic benefits do not appear to be that important to students, this is not necessarily contrary to prior research (Yang and Yoo, 2004) which suggests the TAM can be augmented by decomposing attitudes into their utilitarian and hedonic components. Instead, it asserts that utilitarian attitudes are a key driver of intentions *in this context*. As such decomposing attitudes in this way adds value to our explanation of behavioural intentions. We agree that attitudes are better decomposed into their respective components, but suspect that hedonic attitudes are more likely to be influential within the TAM in other contexts (for instance, when purchasing more conventional consumer innovations – e.g., the iPad).

The results also highlight the validity of the TAM in its most parsimonious form with a statistically significant link between perceived ease of use and future intentions, and between perceived usefulness and future intentions. As such, the results here present further evidence of empirical validity for the TAM in a new context. Thus, perceived ease of use and perceived usefulness are important drivers of future intentions, and, in the context of the model, important drivers of utilitarian attitudes. Perceived usefulness does affect hedonic attitude, but because hedonic attitude does not drive behavioural intentions this seems to be a less important link.

Impulsiveness did not affect behavioural intentions. We speculate that this could be because of the context. For example, it could also be the case that the link between impulsiveness and behaviour is more likely to be stronger in situations where observability of participation is lower, as individuals are more likely to conform with social norms (Stern et al 2008). In the context of adopting Twitter within the learning environment, students' decisions to take part are more likely to be observed by their peers than when they are, say, shopping for new clothes.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This study is limited by a focus on business students, and caution should be taken when generalising the results found here. For example, following on from the research by Buzzard, Crittenden, Crittenden and McCarty (2011), there seem to be differences in preference for technology by students from different subjects. However, given the contemporaneous nature of the topic under investigation, the results here should provide some timely insights into students' acceptance of Web 2.0 technologies. Therefore, further research should seek to replicate the research across different samples of students from different disciplines (e.g., science students, arts students etc.), where preferences and expectations for the use of technology in the classroom may differ. These differences should be taken into account with future research to understand different cohorts on a case by case basis. Though this study provides a general model of technology acceptance based around the context of Twitter adoption in a marketing class, care should be taken when generalising the results to other learning technologies which are being used by instructors (e.g., Second Life —Halvorson, Ewing and Windisch, 2011; YouTube —Payne, Campbell, Bal and Piercy, 2011). Specifically, future research should try to examine the factors of relevance to different learning technologies and their influence on the key drivers of the model derived here. For example, educators should find out, for new technologies that they are going to use, what the key drivers are for perceived usefulness and perceived ease of use. This may differ based on the technology adopted, but needs to be understood to ensure maximum take up in light of the positive learning benefits associated with using such technologies in class.

The TAM is a parsimonious model of technology acceptance behaviour. Though it is highly cited and has been used in a variety of different contexts, it is often criticized for being general. Such models are useful in an exploratory setting such as this, where few contextualized models exist. However, other models of technology usage exist within the learning environment (e.g., Peltier, Drago and Schibrowsky 2003; Peltier, Schibrowsky and Drago, 2007), and these share some degree of overlap with the TAM. For example, the work by Peltier and colleagues shows how a range of variables influence perceived quality of the online learning experience, and these feed into the TAM's key antecedents (perceived usefulness and perceived ease of use). Further research might aim to integrate these models to provide a more comprehensive conceptualization of technology acceptance for Web 2.0 technologies.

The data is also limited by its single source nature, but initial testing did not reveal any significant threats from Common Method Bias, and procedural techniques were used to reduce its impact. However, further research could replicate these findings with longitudinal data and augment the survey data with data from other sources.

CONCLUSIONS

In summary, the common assumption about the use of technology in the classroom is that it enhances learning outcomes and offers a variety of benefits to students (e.g., Clarke, Flaherty and Mottner, 2001; Cronin, 2009; Pitt et al., 2009; Rinaldo, Tapp and Laverie, 2011), although recent claims dispute this belief. The research here does not indicate the extent to which technology is beneficial to students, but does signify that the adoption of technology in the classroom, by students, is far from a foregone conclusion. Indeed, analogous to the experiences of many new products, the adoption of a learning technology is driven by a variety of factors, and amongst them we illustrate the importance of factors such as perceived ease of use, perceived usefulness, students' risk propensity and affinity with computers. By influencing such perceptions and tendencies with appropriate communications, marketing educators can facilitate the adoption of new technologies in the learning environment. Therefore, this paper extends work in the general domain of consumer behaviour, by i) augmenting the TAM to a new and important context, and ii) highlighting the key drivers of student adoption of learning technologies, augmenting a highly cited model in the literature.

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FIGURE 1: The Augmented Technology Acceptance Model for Explaining the Acceptance of Twitter as an Educational Technology

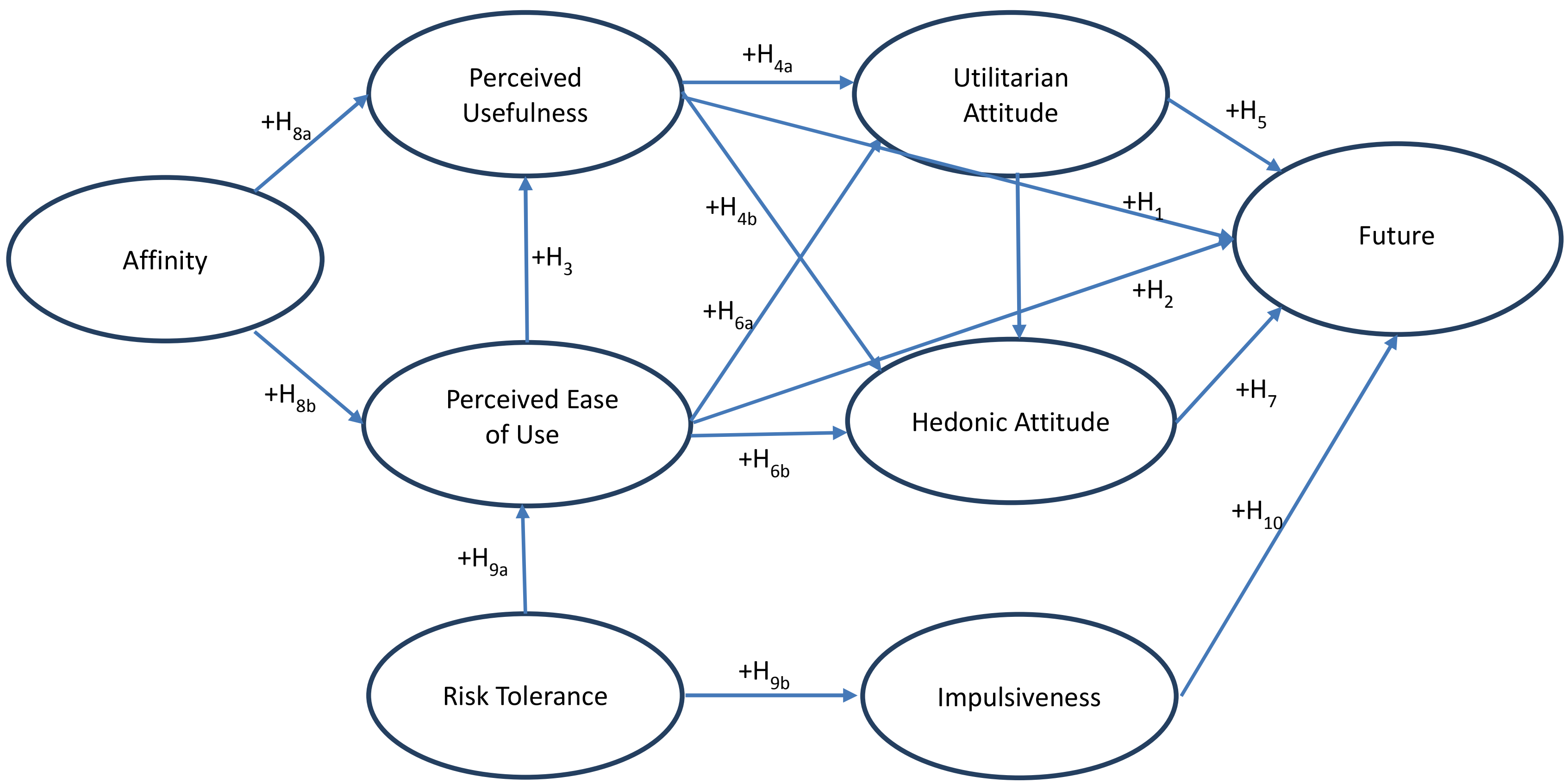

FIGURE 2: Results of the Partial Least Squares Analysis

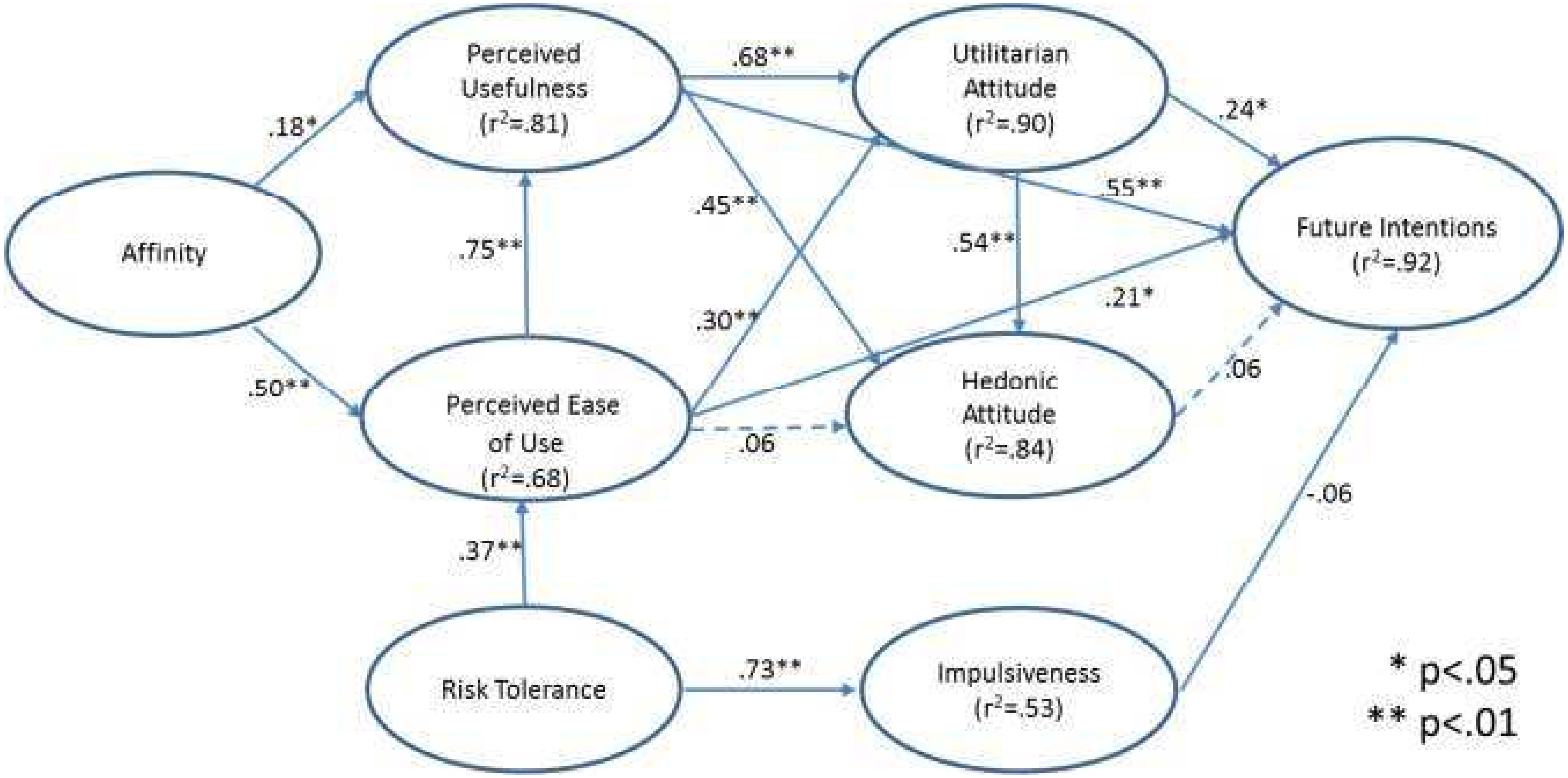

TABLE 1: Factor Loadings, Reliabilities and Descriptive Statistics

Scale and items and loadings of latent constructs	Measurement stats		Mean (Std Deviation)	Alpha Reliability
	Composite reliability	Communality		
Affinity with Computer (3 items) AVE=.92 I would rather use the computer than do anything else. (.95) I would feel lost without my computer. (.96) Using the computer is one of the more important things I do each day. (.87)	.97	.92	4.86 (1.21)	.95
Perceived Usefulness (4 items) AVE=.96 Using Twitter will improve my learning (.98). I would find it easy to get Twitter to do what I would want it to do. (.99) Using Twitter will enhance the effectiveness of my learning. (.99) Using Twitter will be useful for my learning. (.97)	.99	.96	4.81 (1.52)	.99
Perceived Ease of Use (PEOU) (4 items) AVE=.88 My interaction with Twitter does not require a lot of mental effort. (.92) My interaction with Twitter is clear and understandable. (.99) I would find it easy to get Twitter to do what I would want it to do**.** (.95) Twitter is easy to use. (.90)	.96	.88	5.01 (1.34)	.96
Risk Tolerance (8 items) AVE=.74 I am cautious in trying new/different products. (.81) I would rather stick with a brand I usually buy than try something I am not sure of. (.87) When I go to a restaurant, I feel safer to order dishes I am familiar with. (.89) I never buy something I don't know about at the risk of making a mistake. (.76) I enjoy taking chances in buying unfamiliar brands just to get some variety in my purchases. (.90) I never buy something I don't know about at the risk of making a mistake. (.90) If I buy appliances, I will only buy well-established brands. (.89) I enjoy taking chances in buying unfamiliar brands just to get some variety in my purchases (.87).	.95	.74	4.04 (1.09)	.95
Utilitarian Attitude (5 items) AVE=.94 As a learning tool Twitter is Ineffective – Effective (.97) As a learning tool Twitter is Unhelpful – Helpful (.97) As a learning tool Twitter is Not functional – Functional. (.97) As a learning tool Twitter is Unnecessary – Necessary (.95) As a learning tool Twitter is Impractical-practical (.97)	.99	.94	4.61 (1.48)	.98
Hedonic Attitude (3 items) AVE=.95 As a learning tool Twitter is Not fun – Fun (.96) As a learning tool Twitter is Dull – Exciting (.90) As a learning tool Twitter is Unenjoyable – Enjoyable (.98)	.97	.95	4.73 (1.54)	.97
Impulsiveness (4 items) AVE=.89 When I go shopping, I often buy things I had not intended to purchase. (.93) I am a person who makes unplanned purchases. (.97) When I see something that really interests me, I buy it without considering the consequences. (.94) It is fun to buy things spontaneously. (.94)	.92	.89	4.58 (1.26)	.96
Future Intentions (FI) (2 items) AVE=.98 Assuming future courses were to use Twitter as a learning tool, I intend to use it. (.99) If future courses were to use Twitter as a learning tool, I predict I would use it. (.99)	.99	.98	5.01 (1.60)	.98