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Maladaptive vs. Faithful Use of Internet Applications in the Classroom: An Empirical Examination

Pamela S. Galluch
Department of Business & Economics
Roanoke College
galluch@roanoke.edu

Jason Thatcher
Department of Management
Clemson University
jthatch@clemson.edu

Abstract:

This paper develops a model that explains faithful (i.e., appropriate) versus maladaptive (i.e., cyber-slacking) use of Internet technologies in the classroom. Specifically, we model social norms, performance expectancy, effort expectancy, cognitive absorption, perceived threats, and perceived opportunities as antecedents to intentions toward Internet use. Using data collected from 353 respondents, we empirically test our model. Our analysis suggests that distinct antecedents shape faithful and maladaptive intentions toward Internet use. Specifically, we have found that social norms and perceived threats contributed to the intention to cyber-slack, while effort expectancy, performance expectancy, and perceived opportunities contributed to appropriate use of IT. In our study, cognitive absorption was a significant predictor of maladaptive and faithful intentions. The paper concludes with a discussion of our findings' implications for future research and practice.

Keywords: intention to cyber-slack, appropriate use of IT, cognitive absorption

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INTRODUCTION

Internet technologies have assumed an increasingly important role in the personal and professional lives of individuals. At the personal level, individuals routinely use Internet technologies to manage personal correspondence with family and friends (Hoffman et al. 2004), research future purchases (Gefen 2002), and manage their bank accounts (Tan and Teo 2000). At the professional level, individuals use Internet technologies to enable communication with peers and clients (Lee 1994; Markus 1994), share information across organizations (Ko et al. 2005; Teigland and Wasko 2003), and manage basic business processes, such as purchasing (Becker and Gerhart 1996). As high-speed access to the Internet has grown more widespread, it has grown increasingly intertwined with the personal and professional lives (Hoffman and Jones 2005; Rao and Parikh 2003).

Concurrent with the growth of the Internet, educational institutions have moved to integrate Internet technologies into the classroom. Internet technologies have been touted as a means to supplement instruction by providing easy access to multimedia resources or information on current events (Anonymous 2007). For example, Internet-enabled tools are used to update course materials, post grades, and communicate with students (McComb 1994). As mobile computing has grown more pervasive, many universities have offered students access to wireless networks in order to use the Internet during class (Henderson et al. 2004). For example, on many campuses, students use wireless hotspots to access course materials, such as slides, and to take online exams (Shotsberger and Vatter 2001). Through using Internet technologies, faculty have the opportunity to deliver students more timely, relevant, and updated material.

While educational institutions intended to foster learning through providing Internet access, anecdotal evidence suggests that maladaptive uses of the Internet technologies have hindered student learning by enabling cheating (Young 2001) or engaging in non-class-related activities during lectures (Adams 2006; Cole 2007). For example, a Georgetown law professor recently reported that 80 percent of his law students admitted being more productive and more engaged in class discussions when they are laptop-free (Cole 2007). When students have access to Internet-enabled applications, faculty report that many students appear to be “cyberloafing” or “cyber-slacking” at higher levels in the classroom.

Although anecdotal evidence of cyber-slacking abounds, little research has theoretically modeled and empirically tested explanations for why students use Internet technologies for maladaptive purposes during class. Hence, to glean deeper understanding into why Internet technologies have not yielded their promised returns in the classroom, this study investigates the following question:

> *What beliefs and emotions lead to maladaptive vs. faithful behaviors with Internet technologies in the classroom?*

The remainder of the paper is organized as follows. We begin by reviewing literature that frames our model of drivers of faithful and maladaptive uses of the Internet in the classroom. Next, we develop hypotheses tying social influence, performance expectancy, effort expectancy, cognitive absorption, perceived threats, and perceived opportunities to intention to use (a faithful intention) and intention to cyber-slack (a maladaptive intention), where performance expectancy was referred to as perceived usefulness and effort expectancy was referred to as perceived ease of use in early work on technology acceptance. Then, we empirically test and present the results of our model. The paper concludes with implications of our findings for research and practice.

CONTRIBUTION

This paper contributes to the growing literature examining drivers of maladaptive systems use in the class, e.g., cyber-slacking. We do so through integrating well-accepted constructs from the technology diffusion literature (e.g., performance expectancy, effort expectancy, and social norms) and the social loafing literature (e.g., perceived opportunities and perceived threats) to explain why individuals form the intention to cyber-slack. Through tests of competing models, we empirically demonstrate that intention to cyber-slack differs from intention to use, as well as results from different antecedents. By integrating these literatures and demonstrating that intention to cyber-slack has distinct underpinnings from traditional technology diffusion outcome variables, this study lays a useful foundation for future research on maladaptive systems use.

LITERATURE REVIEW

Based on theories drawn from social psychology, extensive research has examined influences on drivers of information technology (IT) use. Perhaps the most popular explanation for technology use, the Technology Acceptance Model (TAM) suggests that performance expectancy and effort expectancy shape intentions and use of IT (Davis 1989; Davis et al. 1989; Szajna 1996; Venkatesh 2000; Venkatesh and Davis 2000). Extensions of TAM have suggested that perceptions of control (Mathieson 1991), the social context, and engagement with the technology (Agarwal and Karahanna 2000) also influence intentions and behavior towards IT. Collectively, this stream of research has found that intentions toward, and actual use of, IT may be explained through understanding users' beliefs and engagement with specific IT.

Although technology use has been frequently investigated, relatively little research has examined drivers of emergent, maladaptive IT use (Chau and Tam 1997; Galluch and Thatcher 2007). Research suggests that individuals use IT in both faithful and unintended ways in organizations (DeSanctis and Poole 1994; Orlikowski and Robey 1991). When used in faithful ways, IT is used in a manner that is either true to the intentions of the organization or that furthers the organization's interests (Galluch and Thatcher 2007). While some of these unintended uses of technology may further the goals of the organization, we focus this study on negative outcomes that arise from emergent, unintended IT use. When used maladaptively, IT is used in emergent, unintended ways that counter the original intentions of the organization.

To understand maladaptive IT use in the classroom, research on cyberloafing suggests directing attention to features of the context that influence whether individuals use technology for faithful or maladaptive purposes. Cyberloafing research focuses on drivers of employees' use of the Internet for non-work-related purposes. This research stream suggests that individual slacking reflects organizational incentive systems. For example, Lim and colleagues (2002, 2002) have argued that how one perceives incentives (i.e., allocation of rewards) influences cyberloafing behaviors. Therefore, cyber-slacking or loafing occurs when individuals lack rewards to stay on task or perceive an absence of negative outcomes from engaging in the behavior.

In this study, we examine whether faithful and maladaptive intentions have different perceptual antecedents. Appropriate Use of IT refers to an individual's intention to use Internet technologies during class in a faithful manner, i.e., consistent with the course instructor's goals. Formally defined, Appropriate Use of ITs evaluates the strength of one's desire to perform a specific behavior (Fishbein and Azjen 1975). TAM-based research frequently uses *Appropriate Use of IT* as a proxy for the actual use of IT in a broad range of contexts from the classroom to home to the workplace. Hence, we use *Appropriate Use of IT* as a proxy for faithful use of Internet technologies.

In addition to faithful behaviors, individuals may also engage in a range of maladaptive behaviors with IT. The intention to cyber-slack refers to the use of the Internet for non-task related purposes (Blanchard and Henle 2006; Lim 2002; Lim et al. 2002). In many classes, students take advantage of the anonymity provided by the lecture and discussion and engage in off-task behaviors (Giraud 1997). In the context of the classroom, cyber-slacking occurs when one uses the Internet in a manner that is inconsistent with the course instructor's goals. Hence, we examine intention to cyber-slack as one form of maladaptive use of Internet technologies (Lim 2002).

HYPOTHESIS DEVELOPMENT

Based on our review of the loafing and TAM literatures, we model intentions as a function of the social context (social norms), perceptions of IT (performance expectancy and effort expectancy), individuals engagement with the IT (cognitive absorption), perceptions of threats, and perceptions of opportunities. See Table 1 for a summary of construct definitions. Figure 1, on the next page, depicts the two competing research models.

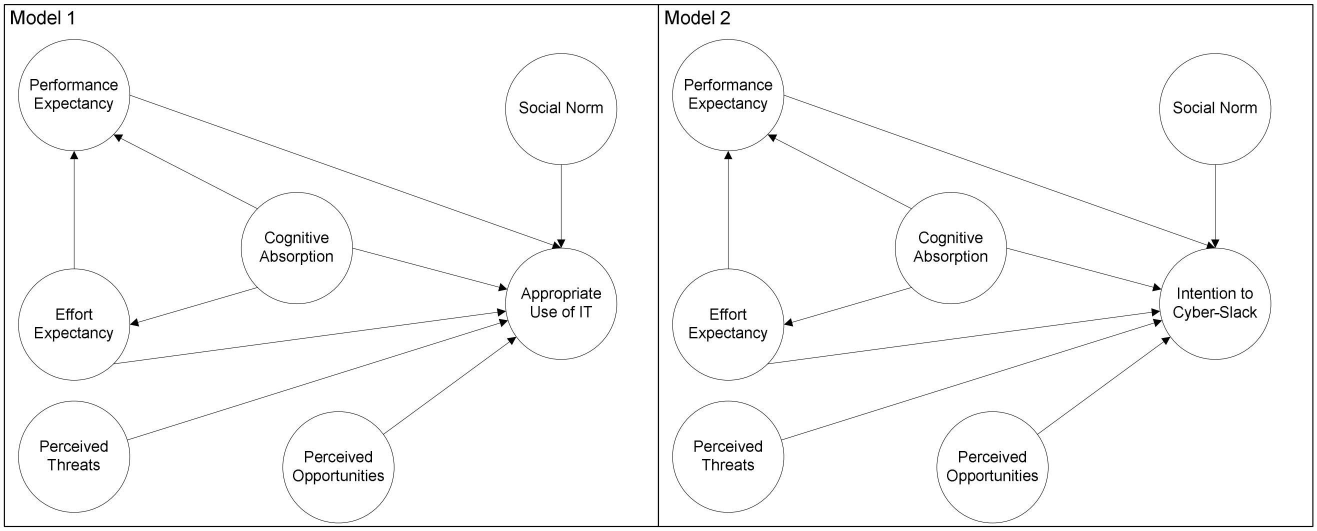

Figure 1. Theoretical models.

Social Norms

Social norms refers to the degree to which individuals believe that people who are important to them think that they should perform that behavior in question (Venkatesh et al. 2003). The term *social norms* captures social pressure to perform a behavior and is used to predict intention toward that behavior (Azjen 1991), i.e., measure the degree to which friends, family, and peers influence an individual's behavior. Even if individuals lack a positive opinion of a behavior, they may comply with social pressure and perform that behavior (Venkatesh and Davis 2000). Within the cyberloafing literature, Lim and colleagues (2002, 2002) argue that the social context, which includes interpersonal relationships, influences cyberloafing. Their findings suggest that cyberloafing occurs when the social context (i.e., peer influence) permits or condones the behavior.

Consistent with TAM research (Venkatesh and Morris 2000; Venkatesh et al. 2003) and cyberloafing research (Lim 2002), we argue that peer influence shapes students' intentions toward using Internet technology in the classroom. When individuals feel that important peers condone a specific behavior with a technology, such as using Internet technology to instant message during class, prior research suggests that they will be more likely to form the intention toward performing the same behaviors with that technology (Venkatesh 1999; Venkatesh and Morris 2000). Consistent with the notion that norms influence varies with the target activity, we examine whether norms toward slacking influence faithful and maladaptive use of the Internet. Although norms toward cyber-slacking direct attention to a maladaptive form of technology use, we believe that they should also relate to faithful use of the Internet in the classroom. However, we posit that when a student feels that important peers condone slacking with Internet technologies, they will be more likely to cyber-slack with Internet technologies in the classroom.

Hypothesis 1: Social norms toward cyber-slacking have a positive effect on:

a. Appropriate Use of IT

b. Intention to Cyber- Slack

Performance Expectancy

Performance Expectancy, also referred to as *perceived usefulness* (Davis 1989), directs attention to the degree to which a person believes that using Internet technologies will enhance his or her performance (Venkatesh et al. 2003). Performance expectancy reflects extrinsic motivation toward technology use in that individuals will report higher performance expectancy when a technology may be used to achieve a valued outcome, such as doing well in class (Davis et al. 1992). Consistent with this logic, we suggest that students who perceive using the Internet results in higher class performance will report higher intentions to use IT in a faithful manner. Hence:

Hypothesis 2a: Performance Expectancy positively affects Appropriate Use of IT.

Table 1: Summary of Construct Definitions	
Construct	**Definition**
Appropriate Use of IT	The intention to use Internet technologies during class in a manner consistent with the course instructor's goals
Intention to Cyber-Slack	The intention to use Internet technologies for non-class related purposes during class meetings
Social Norms	The degree to which individuals believe that people who are important to them think that they should perform that behavior in question (Venkatesh et al. 2003)
Performance Expectancy	The degree to which individuals believe that using Internet technologies will enhance their job performance (Davis 1989)
Effort Expectancy	The degree to which individuals believe that using Internet technologies is free of effort (Davis 1989)
Cognitive Absorption	A *state* of deep involvement (Agarwal and Karahanna 2000) Comprised of 5 dimensions: • Temporal Dissociation: The inability to acknowledge the passage of time while absorbed in an interaction • Focused Immersion: The experience of total engagement where other demands are ignored • Heightened Enjoyment: Capturing the pleasurable aspects of the interaction • Control: A representation of the user's perception of being in charge of the interaction • Curiosity: Tapping into the extent the experience arouses an individual's sensory and cognitive curiosity
Perceived Threats	The perception of punishment that occurs from using Internet technology maladaptively
Perceived Opportunities	The perception of opportunities gained from using Internet technology appropriately

Regardless of whether one chooses to use Internet applications for faithful or maladaptive purposes, individuals who believe that their use will increase classroom performance will also be likely to form the intention to slack. Our logic is that when one expects higher performance associated with technology use, one will be predisposed to form the intention to use that technology for a range of activities. In this study, we model performance expectancy as a driver of performance in the classroom. Although classroom performance and slacking in the classroom are different behaviors (Young 2001), we anticipate that performance expectancy will exert a positive, albeit smaller, influence on intention to cyber-slack. Hence:

Hypothesis 2b: Performance Expectancy positively affects Intention to Cyber-Slack.

Effort Expectancy

Effort Expectancy, also referred to as *perceived ease of use* (Davis 1989; Venkatesh et al. 2003), directs attention to the degree to which individuals believe that using IT is free of effort. Extensive research has found that effort expectancy influences one's intentions to adaptively use IT (Davis 1989; Venkatesh and Davis 2000; Venkatesh et al. 2003). When applied to cyber-slacking, this suggests that students will use the Internet when they perceive it as an effort-free activity. Because effort expectancy should have a consistent positive effect across different types of behavior with a technology, we posit that students will be more likely to report intentions to use as well as to intentions to cyber-slack during class. Hence:

Hypothesis 3: Effort Expectancy positively affects:

a. Intention to Use IT.

b. Intention to Cyber-Slack

We control for the relationship that effort expectancy has with performance expectancy. Prior research has found that effort expectancy positively affects performance expectancy (Davis 1989; Davis et al. 1989; Venkatesh 2000). When one perceives a technology as requiring little effort to use, research suggests that one is more likely to report higher levels of performance expectancy. Hence:

Hypothesis 4: Effort Expectancy positively affects Performance Expectancy.

Often, effort expectancy's relationship with intention is fully or partially mediated by performance expectancy. An indirect or mediated effect implies that in the presence of another independent variable, the direct effect of an independent variable is diminished or disappears (Sobel 1990). Partial mediation occurs when an independent variable has an indirect and a direct effect on the dependent variable. Mediation suggests that when effort expectancy of Internet technologies is high, individuals will report higher performance expectancy and intention to use IT. To be consistent with prior research, we examine whether performance expectancy mediates the influence of effort expectancy on intention. Hence:

Hypothesis 5a: Performance expectancy mediates the influence of effort expectancy on:
a. Appropriate Use of IT
b. Intention to Cyber Slack

Cognitive Absorption

Cognitive Absorption refers to the individual's state of deep involvement (Agarwal and Karahanna 2000). In the psychology literature, early work on cognitive absorption modeled it as a personality trait (Tellegen 1992; Tellegen and Atkingon 1974). However, within the domain of management Information Systems, cognitive absorption has been conceptualized as a state of deep involvement with Internet technologies (Agarwal and Karahanna 2000). Cognitive absorption is thought to be a function of five dimensions, including control, curiosity, heightened enjoyment, focused immersion, and temporal dissociation (for definitions, see Table 1) (Agarwal and Karahanna 2000). When cognitively absorbed, individuals' attention is consumed by using an IT and do not pay attention to the broader environment.

Prior research suggests that cognitive absorption positively affects performance expectancy, effort expectancy, and Appropriate Use of IT to appropriately use IT (Agarwal and Karahanna 2000). This suggests that when students report cognitive absorption when using Internet technologies, their involvement with the technology should positively influence their beliefs about the IT (performance expectancy and effort expectancy), as well as their intention to faithfully use the IT (e.g., Appropriate Use of IT). Hence:

Hypothesis 6: Cognitive Absorption positively affects:
a. Performance Expectancy
b. Effort Expectancy
c. *Appropriate Use of IT*

Individuals can attain an absorbed state when engaging in faithful or maladaptive behavior. When slacking with technologies, individuals often become engrossed in using Internet applications (Charlton and Danforth 2007). In drawing a line between engagement and addiction, their study found that in the case on multiplayer online game playing, individuals were becoming engrossed into the game based on cognitive salience, tolerance, and euphoria. Consider one of the first ubiquitous communication technologies, television. Instead of participating in an act of value; individuals, often referred to as "couch potatoes," grow cognitively absorbed in programs and watch TV for hours (Kubey and Csikszentmihalyi 2002). Users of Internet technologies may enter similar state of cognitive absorption. Many users of the Internet applications, such as instant messaging (IM) or games, report heightened levels of pleasure and losing track of time (i.e., cognitive absorption). When a student reports having experienced cognitive absorption using Internet technologies, they will be predisposed to experiencing cognitive absorption in the classroom and are likely to report higher intention to cyber-slack. Hence:

Hypothesis 6d: Cognitive Absorption positively influences Intention to Cyber-Slack.

Perceived Opportunities

Perceived opportunities refer to individuals' perception of opportunities for on-task performance or benefits directly derived from faithful use of the Internet during a specific class. Perceived opportunities tap into incentive structures embedded into the academic environment, which encourages individuals to use IT faithfully. The social loafing literature provides a useful explanation for how incentives and the context influence appropriate uses of IT in the classroom. Individuals slack for a variety of reasons including low intrinsic motivation and anonymity (Chidambaram and Tung 2005; Karau and Williams 1993). For example, George (1992) examined the influence of intrinsic and extrinsic task-related motivators on social loafing and found that when outcomes of group collaboration are low or shared by the group, individuals are more likely to free ride and slack. Alternatively, individuals perform adaptively when they perceive they will still reap the rewards of group work (Latane et al. 1979). The social loafing literature suggests that individuals will perform faithfully when they perceive direct opportunities from behaving in a manner that benefits the group. Therefore, perceived learning opportunities provided by the Internet are likely to positively influence appropriate use of IT and less likely to influence the intention to cyber-slack. Hence:

Hypothesis 7: Perceived Opportunities:
a. Positively influence Appropriate Use of IT
b. Negatively influence the Intention to Cyber-Slack

Perceived Threats

Perceived threats refer to the perception that punishment will result from cyber-slacking. Threats imply a "negative situation in which loss is likely and over which one has relatively *little control"* (Dutton and Jackson 1987, p. 80). Perceptions of threats have had a significant effect on behaviors (Chattopadhyay et al. 2001). When one perceives the threat of punishment for cyber-slacking, we anticipate a corresponding decrease in the intention to cyber-slack. However, threats of punishment as a result of cyber-slacking should not relate to intention to faithfully use IT. Instead the threat of punishment from not performing faithfully with the technology will promote positive behaviors. We posit that perceived threats will influence a negative effect on the intention to cyber-slack and a positive effect on appropriate use of IT. Hence:

Hypothesis 8: Perceived Threats:
a. Positively influence Appropriate Use of IT
b. Negatively influence Intention to Cyber-Slack

METHOD

Data was collected from students at a large university in the southeastern United States. At this university, students are required to purchase a laptop for use during class. To encourage use of laptops, the university has made wireless access available throughout all on-campus classrooms. Although instructors do not always require using laptops during lectures, students often use them to take notes during class. Further, it is important to note that although required to purchase a laptop as first-year students, the university does not require students to maintain their laptop. As a result, some students do not have access to the Internet during class time.

Respondents were enrolled in one of four classes (1) a senior-level statistics class, (2) a junior-level overview of Management Information Systems class, (3) a senior-level Strategy class, or (4) a senior-level organizational behavior class in the College of Business. These courses are required for all business majors and represent a substantial cross-section of students from each major. Moreover, we solicited participation from instructors who indicated that they use laptop-based activities (e.g., Excel, Word, Internet-based cases) as a core part of their pedagogical activities. With the approval of our Institutional Review Board, we offered students extra credit in their course in exchange for completing the survey.

A total of 353 students voluntarily participated in the study. Respondents were instructed to provide candid answers and assured that their responses were confidential. ICTs as laptop activities such as surfing the Web, online gaming, or instant messaging, or using a cell phone for activities such as browsing the Web or text messaging. To ensure respondents' privacy, the instructor for each class was provided only the list of names of participants and never had access to the individual responses. Each group of students was provided a two-week window to complete the survey. Because access to the Internet during class is a prerequisite to cyber-slacking, we removed students who reported that they lacked access to the Internet during class, which yielded 311 usable observations.

Table 2: Sample Characteristics

		Mean	Standard Deviation	
Age		21.36	2.61	
Years Using the Internet		9.16	2.27	
Gender	Male	62.92%		
	Female	37.08%		
Class Status	Freshman	Sophomore	Junior	Senior
	3.03%	10.30%	28.18%	58.48%

Table 2 reports our sample's characteristics. On average, the respondents were primarily seniors, and twenty-one years of age. Slightly over half of the students were male, which is representative of the population of students at the research site. Our respondents also indicated their extensive experience using the Internet.

Construct Measures

All constructs were measured using multi-item Likert-type scales (see Appendix 1 for a complete list of items by construct). Cognitive absorption was measured using Agarwal and Karahanna's (2000) scale. Social norms were operationalized using items drawn from Venkatesh and Morris (2000). Measures of performance expectancy, effort expectancy, and appropriate use of IT were adapted from (Agarwal and Karahanna 2000).

Consistent with guidelines offered by Straub (1989), we used a multistage process to develop a measure of intention to cyber-slack, perceived threats, and perceived opportunities(Galluch and Thatcher 2006, 2007). First, we reviewed the literature for a validated measure of cyber-slacking, perceived threats, and perceived opportunities. After failing to identify an appropriate measure, items were developed to capture the representative constructs. Next, the survey was peer-reviewed by fifteen faculty and graduate students. Since the reviewers were not familiar with the purpose of this research, we believe that their evaluations were objective and unbiased. Each item was measured using a five point Likert scale (1 = strongly disagree, 3 = neither, 5 = strongly agree). Construct means and standard deviations are reported in Table 3.

Table 3: Descriptive Statistics

Construct	Mean	Std. Dev
Intention to Cyber-Slack (ITS)	3.46	1.13
Appropriate Use of IT (AUIT)	4.50	0.80
Cognitive Absorption: Heightened Enjoyment (CAHE)	4.10	.706
Cognitive Absorption: Curiosity (CAC)	3.66	.801
Cognitive Absorption: Temporal Dissociation (CATD)	4.03	.731
Cognitive Absorption: Focused Immersion (CAFI)	3.33	.674
Cognitive Absorption: Control (CACTL)	3.57	.644
Performance Expectancy (PE)	4.04	0.93
Effort Expectancy (EE)	3.93	0.85
Social Norms (SN)	2.88	1.10
Perceived Threats (PT)	3.14	1.04
Perceived Opportunities (PO)	3.80	0.92

Results

To test our empirical model, we used the Partial Least Squares (PLS) approach to structural equation modeling. PLS was particularly useful because it handles, with relative ease, modeling formative, multidimensional constructs such as cognitive absorption (Chin 1998). We report our analysis in two steps—measurement and structural.

Measurement Model

We evaluated the measurement model in two steps. Because cognitive absorption is a second-order formative construct, we evaluated its properties separately from the remainder of the measurement model. An exploratory factor analysis (EFA) using Proxmax rotations (Bollen 1989), an oblique rotation method, confirm CA's dimensions discriminant and convergent validity. Given reasonable evidence of cognitive absorption's dimensionality, we modeled it as a second-order multidimensional construct in the remainder of our analysis. To do so, we used each dimensions' latent variable as indicators of CA. We used this approach because PLS does not support directly modeling second-order constructs and it is consistent with work examining cognitive absorption (Agarwal and Karahanna 2000).

Next, we evaluated the full measurement model. First, we established the convergent and discriminant validity of the reflective construct measures. For reflective measures, convergent validity suggests that each item moves in the same direction as the construct of interest (Campbell and Fiske 1959). Item loadings and intra-construct reliabilities greater than .71 are considered *excellent* (Comrey and Lee 1992). Discriminant validity was assessed by determining if items loaded higher on the construct of interest rather than on other constructs. All items for reflective constructs met the excellent threshold except PT3. After removing PT3, our analysis indicated that all items loaded on the appropriate construct with relatively low cross-loadings on alternative constructs.

Also, we examined the average variance extracted (AVE) as a means to glean supplemental evidence of discriminant and convergent validity. If an AVE is .50 or greater, it provides evidence of convergent validity (Fornell and Larcker 1981). Discriminant validity was assessed by comparing the square root of the AVE to the construct correlations (see Table 4). To be discriminant, the square root of the AVE should be greater than the correlation with the off-diagonal elements (Agarwal and Karahanna 2000; Chin 1998). Each construct shares more variance with their respective indicators than with other constructs. Thus, our analysis provides support that our measures were convergent and discriminant for our reflective constructs.

Table 4: Inter-Construct Correlations

	ICR*	ITS	AUIT	SN	EE	PE	PO	PT	CA HE	CA C	CA CTL	CA FI	CA TD
ITS	0.83	0.70***											
AUIT	0.95	0.07	0.95										
SN	0.82	0.42	-.05	0.92									
EE	0.87	0.10	0.36	-0.01	0.85								
PE	0.90	0.06	0.50	-0.02	0.33	0.88							
PO	0.87	-.01	0.35	0.04	0.34	0.41	0.89						
PT	.81**	-.29	-.06	-.24	-.19	-.07	-.07	.91**					
CA_HE	0.86	0.23	0.36	0.06	0.48	0.29	0.32	-.13	0.86				
CA_C	0.90	0.20	0.16	0.14	0.39	0.24	0.31	-.15	0.47	0.92			
CA_CTL	0.43	0.04	0.33	0.00	0.53	0.35	0.30	-.09	0.27	0.31	0.71		
CA_FI	0.76	0.13	0.08	0.06	0.31	0.10	0.16	-.04	0.21	0.29	0.31	0.74	
CA_TD	0.90	0.21	0.45	-0.03	0.43	0.23	0.24	-.17	0.49	0.29	0.35	0.32	0.85

* Internal Composite Reliability (ICR)= ∑ (λi)2 / [∑ (λi)2 + ∑ (var(εi)] where λi = component loading to an indicator and var(εi)=1 - λi2.

** Reliability statistics reported after one item was dropped.

*** The shaded numbers on the leading diagonal are the square root of the average variance shared between the constructs and their measures. Off diagonal elements are the correlations among constructs. For Discriminant validity, diagonal elements should be larger than off-diagonal elements.

Cognitive absorption was operationalized as a formative construct because its dimensions do not theoretically co-vary (Bollen 1984). Table 5 reports the weights for each indicator. The weights for formative measures are interpreted in a manner similar to beta coefficients in a standard regression and measure the relative contribution of each item to the overarching formative construct (Chwelos et al. 2001). A significant p-value for a t-statistic suggests that an indicator significantly contributes to a construct's measurement. CAHE, CAC, CAFI, CATD, and CACTL were all found to be a significant contributor to the second order dimension, cognitive absorption (all p-values < .01). Hence, our analysis indicates that each dimension significantly contributes to CA, providing additional evidence of the strength of our measurement model.

Table 5: Weights of Formative Construct

Construct	Weight	T-statistic *	p-value
CAHE	0.3171	16.08	p < .01
CAFI	0.2996	17.01	p < .01
CACTL	0.3129	17.50	p < .01
CAC	0.2546	10.97	p < .01
CATD	0.2752	15.53	p < .01

* P-values correspond to t-statistics. Significant t-statistics move away from 0, while significant p-values move toward 0. For example, a p-value of .05 is statistically significant and corresponds to a t-statistic of 1.645. Taking one t-statistic from the item weights, CAHE had a t-statistic of 16.08 which has a highly p-value < than .01.

Structural Model

Structural model results provide mixed support for our hypotheses (see Figure 2 and Table 6[1]). Social Norms did not demonstrate a significant relationship with appropriate use of IT (H1a: -.046; t-statistic = 1.436; p-value = n.s.), but exhibited a significant positive relationship with intention to cyber-slack (H1b: .396; t-statistic = 7.634; p-value <

[1] Because we looked at the same relationships, we ran the paths in one structural equation model. Therefore, the value between PE and EE are consistent for across hypotheses.

.001). Performance expectancy was positively related to appropriate use of IT (H2a: .341; t-statistic = 5.886; p-value < .001) and not significantly related to intention to cyber-slack (H2b: .087; t-statistic = 1.447; p-value = n.s.). Effort expectancy influenced neither appropriate use of IT (H3a: .039; t-statistic = .791; p-value = n.s.) nor intention to cyber-slack (H3b: -.022; t-statistic = .506; p-value = n.s.).

To test for mediation of effort expectancy's influence by performance expectancy (H5), we used Sobel's(1982) test for mediation using the following equation:

z-value $= (a*b) / \sqrt{(b^2 * s_a^2 + a^2 * s_b^2)}$ *where,*

a = beta coefficient of the independent variable to the mediator variable

b = beta coefficient of the mediator variable to the dependent variable

s = standard error of the beta coefficient

Consistent with prior research (Agarwal and Karahanna 2000),we found that the performance expectancy mediated the relationship from effort expectancy to appropriate use of IT (t-statistic = 2.43; p-value < .05). Regarding maladaptive behaviors, we found that the indirect effect of performance expectancy intention to cyber-slack was not significant (t-statistic = 1.30; p-value = n.s.). Given the lack of a significant direct effect from performance expectancy to intention to cyber-slack, this result was unsurprising.

Cognitive absorption exerted a pervasive influence across models (H6). Cognitive absorption significantly predicted effort expectancy and performance expectancy (H6a: .316; t-statistic = 3.517; p-value < .001, H6b: .653; t-statistic = 17.176; p-value < .001). Also, cognitive absorption positively related to appropriate use of IT (H6c: .289; t-statistic = 3.925; p-value < .001) and intention to cyber-slack (H6d: .300; t-statistic = 3.746; p-value < .001).

Table 6: Summary of Hypotheses

Hypothesis		Path and T-statistic		Hypothesis		Path and T-statistic	Supported (Yes/No)
H1a	SN → AUIT	-0.046 (1.436)	No	H1b	SN → ITS	0.396 (7.364)	Yes
H2a	PE → AUIT	0.341 (5.886)	Yes	H2b	PE → ITS	0.087 (1.447)	No
H3a	EE → AUIT	0.039 (.791)	No	H3b	EE → ITS	-0.022 (.506)	No
H4	EE → PE	0.138 (1.720)	Yes				
H5a:	Mediation: EE → PE→ AUIT		Yes	H5b:	Mediation: EE → PE →ITS		No
H6a	CA → PE	0.316 (3.517)	Yes	H6b	CA → EE	0.653 (17.176)	Yes
H6c	CA → AUIT	0.289 (3.925)	Yes	H6d	CA → ITS	0.3 (3.746)	Yes
H7a	PO → AUIT	0.097 (1.981)	Yes	H7b	PO → ITS	-0.092 (1.596)	No
H8a	PT → AUIT	0.039 (1.107)	No	H8b	PT → ITS	-0.146 (2.882)	Yes

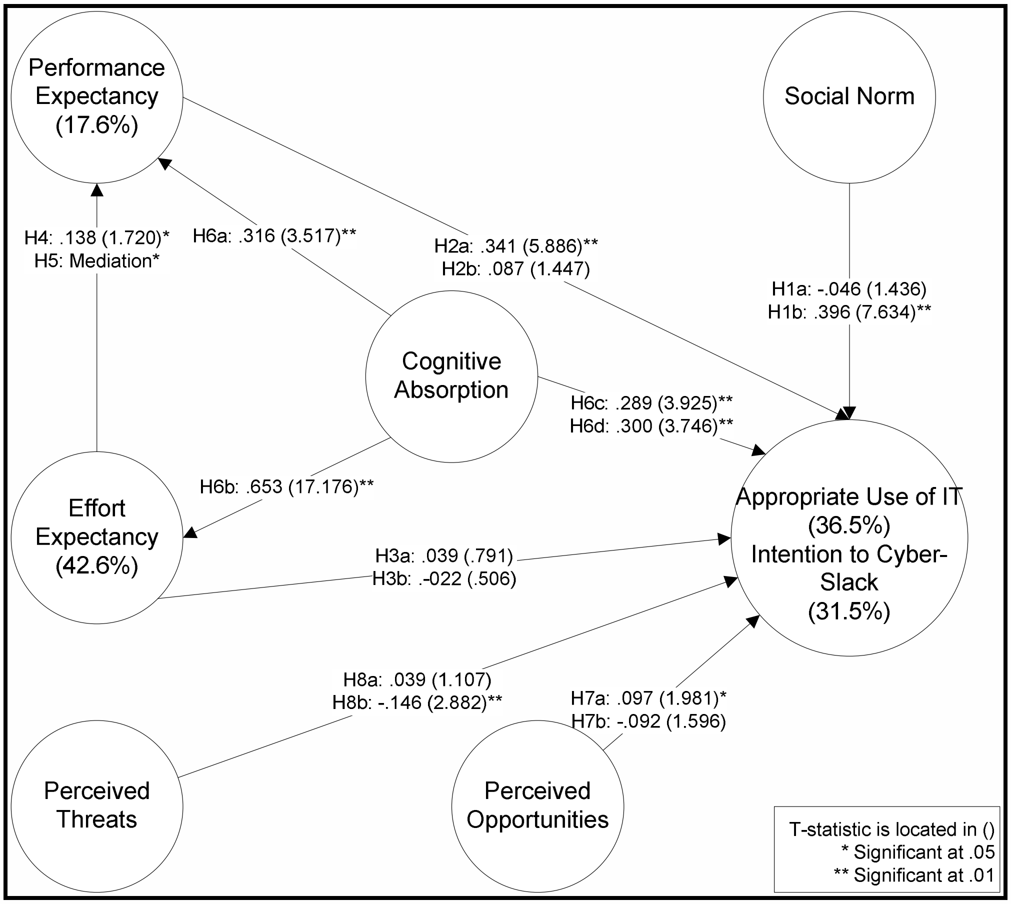

Figure 2. Results from PLS analysis.

In terms of perceived threats and opportunities, PT was negatively related to intention to cyber-slack (H8b: -.146; t-statistic = 2.882; p-value < .05), but had no significant effect on appropriate use of IT (H8b: .039; t-statistic = 1.107; p-value = n.s.). On the other hand, perceived opportunities had a positive significant effect on appropriate use of IT (H7a: .097; t-statistic = 1.981; p-value < .05) and had no effect on the intention to cyber-slack (H7b: -.092; t-statistic = 1.596; p-value = n.s.).

Finally, social norms, effort expectancy, performance expectancy, cognitive absorption, perceived opportunities, and perceived threats explained 36.5 percent of the variance in appropriate use of IT and 31.5 percent of the variance in intention to cyber-slack. We calculated the f^2 to assess the strength of our model's ability to predict faithful and maladaptive intentions. An f^2 for each intention was calculated in the following manner:

$$f^2 = R^2 / (1-R^2)$$

Generally, an f^2 effect sizes of .02, .15, and .35 are considered small, medium, and large (Cohen 1988). Based on our calculation, both models explained a large amount of variance in intentions (model appropriate use of IT = 0.575; model intention to cyber-slack = 0.460).

Common method variance, where self-reported measures may inflate the observed relationships between constructs, constitutes one concern about our research. However, James et al. (1979) report that common method variance is only prevalent where a pattern of high correlations among constructs is evident. As illustrated in Table 5, the correlations among constructs were generally low and varied across the model, suggesting that common method variance did not significantly confound our results.

DISCUSSION

Our analysis suggests that distinct antecedents shape faithful and maladaptive intentions toward the use of Internet applications. Effort expectancy, performance expectancy, and perceived opportunities demonstrated positive, significant relationships with appropriate use of IT. Social norms exerted a positive influence on intention to cyber-slack, while perceived threats exerted a negative relationship with intention to cyber-slack. Cognitive absorption influenced intentions toward faithful and maladaptive intentions. In the following section, we discuss our findings and their implications, and their limitations.

Our findings suggest that the nomological network leading to each type of intentions differs. A possible source of this difference may be whether the activity is regarded as mandatory or voluntary. Students may perceive faithful use of Internet applications as a mandatory behavior (Venkatesh et al. 2003). On one hand, if students perceive faithful use as mandatory, informal influences such as social norms may not strengthen their intentions to perform the behavior. On the other hand, lacking a mandate toward a specific type of behavior, informal social influences, such as social norms, may influence intentions to perform a behavior. In our study, we found that relevant peers influence the intention to perform a maladaptive, emergent voluntary behavior, i.e., intention to cyber-slack. Future research can further test this influence by measuring proximity to the behavior. For example, it would be interesting to examine whether peers slacking during the same class time exerted greater influence to perform a behavior than peers found in the broader "school context."

Another possible source of this difference besides mandatory vs. voluntary perceptions is that students may believe that they are skilled multi-taskers. If students believe they can multi-task both on-task and off-task activities in the classroom well, they may not perceive their activities as slacking because they intend to faithfully use the technology and include unfaithful use. Further research in warranted to fully understand the extent of multitasking going on in the classrooms and its relationship with slacking. While students still perceive themselves as using the technology efficiently, they are still slacking, thus impeding their performance in the long run.

Contrary to expectation that performance expectancy would have a positive relationship with faithful and maladaptive intentions, we found that it had a significant effect on appropriate use of IT and no effect on intention to cyber-slack. Our results suggest beliefs about performance may not be germane to predicting all types of intentions and behavior. Even though individuals may perceive a technology as being a useful learning tool, they may not transfer feelings of usefulness toward performance in class toward non-class-related activities such as slacking. A plausible explanation lies in how we operationalized performance expectancy. Consistent with prior research, our measures of performance expectancy directed attention to improving performance (Venkatesh et al. 2003), i.e., using Internet applications enables earning better grades in the classroom. Because our items directed attention to performance in class and not other behavioral outcomes, our non-finding may suggest that researchers need to re-conceptualize how they measure performance expectancy when trying to predict emergent and/or maladaptive behaviors with IT. For example, a useful extension of our work would be to develop a measure of beliefs about the Internet to enable useful or interesting diversions from mundane tasks.

We found that effort expectancy did not influence faithful or maladaptive intentions. A plausible explanation for our finding regarding appropriate use of IT is that our investigation examined intentions in a post-adoption context. After users adopt a technology, researchers have found that effort expectancy exerts either a weaker or no influence on intentions to use a technology (Venkatesh et al. 2003). However, our non-finding of a relationship between effort expectancy and intention to cyber-slack is puzzling. We anticipated that if students regarded using a technology as relatively easy, they would be more likely to form the intention to cyber-slack with the technology. Surprisingly, this was not the case.

Rather than effort expectancy driving appropriate use of IT or intention to cyber-slack, our results suggest that cognitive absorption, i.e., one's engagement with the technology, drives post-adoption intention toward using Internet applications. This finding is interesting in that the common wisdom suggests that individuals daydream or slack because it is an easy way to relieve the tedium of attending courses, e.g., boredom, fatigue, lack of interest in the subject. In direct contrast to this idea, our findings suggest that slacking and conceivably other emergent post-adoption behaviors may be driven by one's past mental engagement with the technology (i.e., prior experience with cognitive absorption). For future research, this finding suggests directing attention toward how features of the technology or one's experience predispose one to experience cognitive absorption may yield insight into emergent post-adoption technology use. For educators, our implication is somewhat grim—even if lectures or classroom activities are engaging, students may be predisposed to cyber-slack because of prior experience with cognitive absorption. To understand how to disrupt the pervasive influence of cognitive absorption, future research should experiment with mechanisms that "disrupt" cognitive absorptions' influence on intentions in general and "focus" its influence on promoting faithful use of IT in the classroom.

We found that perceived opportunities and perceive threats had different implications for appropriate use of IT and intention to cyber-slack. Perceived opportunities positively related to, and perceived threats exhibited no relationship with, students reporting intentions to faithfully use Internet applications. This finding lends credence to the popular idea that when one offers rewards, not punishment, people will work more diligently toward an extrinsic, positive outcome. Alternatively, our findings suggest that threats of negative outcomes diminished the intention to cyber-slack. Perhaps because students do not perceive extrinsic rewards from cyber-slacking, when threatened with negative outcomes, students will be less likely to "risk" engaging in a maladaptive behavior.

While our integrative model let us examine appropriate use of IT alongside slacking behaviors during class time, there is room for future research focused on slacking specific conceptualizations of core constructs. For example, while we examined *subjective norm* as one's peers normative views about IT use, we did not distinguish between whether peers believe one "should" perform an activity (i.e., peers encourage it) or whether they believed it was "OK" (i.e., indifferent) for one to slack during class. Also, while we directed respondents' attention toward laptop-enabled activities such as surfing the Web, online gaming, or instant messaging, future research may need to examine drivers of specific forms of slacking. For example, one might find that cognitive absorption requires a different conceptualization with different stems and technology-specific items if examining slacking through texting on your cell phone. Hence, while our research provides a useful foundation for research on cyber-slacking, there remains much room for future research on slacking, as well as technology-specific conceptualizations of constructs examined in our model.

CONCLUSION

This paper was motivated by a desire to understand why students slack using Internet applications in the classroom. Our study provides initial evidence that faithful and maladaptive intentions toward using Internet applications have different drivers. Our findings are important because many students are experienced Internet users. Therefore, understanding the influence of prior cognitive absorption on students' cyber-slack and appropriate use of IT provides insight into why faculty report such difficulty winning students' attention in the classroom.

Until there is additional research examining specific behavioral remedies to cyber-slacking, our findings suggest that educational institutions may need to consider structural solutions to limit cyber-slacking in classes. For example, educational institutions may want to limit the range of applications or websites that students may have access to in the classroom. However, limiting access must be balanced with offering students access to information necessary for learning in the classroom. For example, blocking access to certain Internet technologies may limit the instructor's ability to dynamically modify content, counteracting one of the benefits of access to Internet applications in the classroom. Given the practical reality that the Internet is increasingly pervasive in the classroom, we believe faculty would be well-served to extend our research model by examining how measures, such as those alluded to above, influence students intentions and behavior in the classroom.

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Appendix A. Survey Items	
For intention to Cyber-Slack and Appropriate Use of IT, students were instructed to think about the use of Information Technology in the classroom. If they intended to use IT in a manner that supported learning, they were instructed to report higher scores for appropriate use of IT. If they intended to use IT to cyber-slack, they were instructed to report higher scores for appropriate use of IT. Because one could concurrently plan to engage in appropriate use *and* cyber-slacking, respondents were informed that they could report high levels of each set of intentions (e.g., they were not inversely related). Intention to Cyber-Slack—Thinking of how you plan on using Internet Technologies during class in the future, answer the following questions:	
ITS1	I plan on using Internet Technologies for non-class related reasons during class in the future.
ITS2	I intend to continue using Internet Technologies for entertainment reasons during class in the future.
ITS3	I expect my use of Internet Technologies to distract me during class in the future.
Appropriate Use of IT—Thinking of how you intend to use Internet Technologies during class in the future, answer the following questions:	
AUIT1	I plan to use Internet Technologies in the future.
AUIT2	I intend to continue using Internet Technologies in the future.
AUIT3	I expect my use of Internet Technologies to continue in the future.
Subjective Norm—Thinking of how your friends influence your decision to use Internet Technologies, answer the following questions:	
SN1	People who influence my behavior think that I should use Internet Technologies to slack.
SN2	People who are important to me think that I should use Internet Technologies to slack off in class.
Effort Expectancy—Thinking of how easy to use Internet Technologies are during class time, answer the following questions:	
EE1	Learning to operate Internet Technologies is easy for me.
EE2	I find it easy to get Internet Technologies to do what I want it to do.
EE3	It is easy for me to become skillful at using Internet Technologies.
EE4	I find Internet Technologies easy to use.
Performance Expectancy—Thinking of how useful Internet Technologies are during class time, answer the following questions:	
PE1	Using Internet Technologies enhances my effectiveness in college.
PE2	Using Internet Technologies enhances my productivity.
PE3	I find Internet Technologies useful in my college activities.
PE4	Using Internet Technologies improves my performance in college.
Cognitive Absorption—Thinking of how you feel when you use Internet Technologies during class time, answer the following questions:	
Temporal Dissociation	
CATD1	Time appears to go by very quickly when I am using Internet Technologies.
CATD2	Sometimes I lose track of time when I am using Internet Technologies.
CATD3	Time flies when I am using Internet Technologies.
CATD4	Most times when I get on to Internet Technologies, I end up spending more time that I had planned.
CATD5	I often spend more time on Internet Technologies than I had intended.
Focused Immersion	
CAFI1	While using Internet Technologies I am able to block out most other distractions.
CAFI2	While using Internet Technologies, I am absorbed in what I am doing.
CAFI3	While on Internet Technologies, I am immersed in the task I am performing.
CAFI4®	While on Internet Technologies, I get distracted by other attentions very easily.
CAFI5	While on Internet Technologies, my attention does not get diverted very easily.
Control	
CACTL1	When using Internet Technologies I feel in control.
CACTL2®	I feel that I have no control over my interaction with Internet Technologies.
CACTL3	Internet Technologies allow me to control my computer interaction.

Heightened Enjoyment	
CAHE1	I have fun interacting with Internet Technologies.
CAHE2	Using Internet Technologies provides me with a lot of enjoyment.
CAHE3	I enjoy using Internet Technologies.
CAHE4®	Using Internet Technologies bores me.
Curiosity	
CAC1	Using Internet Technologies excites my curiosity.
CAC2	Interacting with Internet Technologies makes me curious.
CAC3	Using Internet Technologies arouses my imagination.
Perceived Opportunity—Thinking of how you perceive the use of Internet Technologies during class time, answer the following questions:	
PO1	In class, Internet Technologies will help me attain the goals that I need to survive in the future.
PO2	In class, I feel that Internet Technologies aid in my understanding of the material.
PO3	I understand the opportunity that Internet Technologies bring.
Perceived Threat—Thinking of threats posed by using Internet Technologies during class, answer the following questions:	
PT1®	If I slack with Internet Technologies in class, nothing bad will happen.
PT2®	I do not perceive a threat from slacking with Internet Technologies.
PT3*®	No consequences will occur from slacking with Internet Technologies.
*Dropped Due to Low Item Reliability ® Reverse Coded	

ABOUT THE AUTHORS

Pamela S. Galluch is an Assistant Professor and Internship Director in the Department of Business and Economics at Roanoke College. She holds a B.B.A. in Decision Sciences and Information Systems from the University of Kentucky and a M.S. in Accounting and Computer Information Systems from Middle Tennessee State University and a Ph.D. from Clemson University. Her research examines the influence of information and communication technology characteristics on stress and coping behaviors. She also studies adaptive and maladaptive uses of the Internet. Her papers appear in *MIS Quarterly* and the *Journal of Information Technology Theory and Application*. Pamela has attended Southern Management Association doctoral consortium, the Americas Conference in Information Systems doctoral consortium, and the ICIS Junior Faculty Consortium. She is also the winner of the Distinguished Alumni Achievement Fellowship for postdoctoral research.

Jason Bennett Thatcher is an Associate Professor in the Department of Management at Clemson University. His research examines the influence of individual beliefs and characteristics on the use of information technology. He also studies strategic and human resource management issues related to the application of technologies in organizations. His work has appeared in or is forthcoming in *MIS Quarterly*, *Communications of the ACM*, *Journal of Management Information Systems*, *IEEE Transactions on Engineering Manage-ment*, *American Review of Public Administration*, and the *Journal of Applied Psychology*.

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