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Recommended Citation

Galluch, Pamela S. and Thatcher, Jason Bennett, "Slacking and the Internet in the Classroom: A Preliminary Investigation" (2006). *SIGHCI 2006 Proceedings*. 12.
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Slacking and the Internet in the Classroom: A Preliminary Investigation

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ABSTRACT

This paper investigates “slacking with Internet technologies” in a classroom environment. Rooted in the literature on social loafing, we develop a model linking attributes of the context, the individual, and technology to “intention to cyber-slack” and its influence on the effective use of Internet technology. Using data collected from 128 student respondents, we empirically test our model using the Partial Least Squares approach to structural equation modeling. Our analysis found support for many of the relationships in the theoretical model. Specifically, we found that personal innovativeness with IT and multi-tasking with internet applications contribute to cognitive absorption, while cognitive absorption and subjective norms contributed to the intention to cyber-slack. Further, we found that intention to cyber-slack accounted for a large amount of the variance in effective use of Internet technologies. The paper concludes with a discussion of implications for research and practice.

Keywords

Cognitive Absorption; Intention to Cyber-Slack; Technology Effectiveness; Theory of Reasoned Action; Theory of Planned Behavior; Interactional Model

INTRODUCTION

Over the past 15 years, 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 correspondence with family and friends, research purchases, or manage their bank accounts. At the professional level, individuals use Internet technologies to enable communication with peers and clients, share information across organizations, and manage basic business processes such as purchasing or human resource management. As high-speed access to the Internet has grown more widespread, forecasts suggest that it will grow increasingly intertwined with the personal and professional lives of individuals across national and social lines.

Concurrent with the growth of the Internet in the broader society, higher educational institutions have moved to integrate Internet applications into the infrastructure supporting the classroom. With the growth of mobile

computing, Internet technologies have grown inextricably intertwined with classroom activities. For example, on many campuses, students’ use wireless hotspots to access course materials such as slides or to take on-line exams. Through using Internet technologies, faculty delivers timely, relevant, and updated material to their students.

Although ostensibly valuable for many practical purposes, the Internet has provided opportunities for maladaptive behavior in the classroom. Contrary to “rosy” reports of Internet-enabled learning, practitioner reports suggest that the Internet has become an impediment to learning. It seems that when students have access to Internet-enabled applications, faculty report many students appear to be “loafing” or “slacking” at higher levels in the classroom.

To glean deeper understanding into why Internet technologies have not yielded their promised returns in the classroom, this study investigates how attributes of the context, the individual, and the technology influence the effectiveness of Internet technology (IT) use in the classroom. Specifically, we focus on the follow question: *What causes students to “cyber-slack” in the classroom?* The paper unfolds as follows: We begin with a focused review of the Psychology and Management Information Systems literature that informs our understanding of social loafing and its relationship to IT use. Then, we empirically test and present the results of our research model. The paper concludes with implications for practice and research.

LITERATURE REVIEW

Our research model draws on two theoretical strands – the Theory of Planned Behavior and the Interactional Model for Individual Adjustment Research.

The Theory of Planned Behavior (TPB) suggests that a behavior is positively influenced by intention (Ajzen, 1991). In this study, we examine effective use of Internet technology (TE) as the behavior. Intention to cyber-slack (ITS) is posited as the behavior intention directly affecting technology effectiveness. TPB posits that perceptions of behavioral control affects intentions and actual behavior (Ajzen, 1991). In our model, behavioral control is captured in two constructs. First, we model subjective norms (SN), a measure of peer influence (Venkatesh, 1999), as a direct antecedent to intention to cyber-slack. Second, control is a dimension of cognitive absorption (CA; Agarwal and Karahanna, 2000).

The Interactional model for individual adjustment is the second stream of research that informs our understanding of how individuals form the intention to cyber-slack. The Interactional model posits that “situations vary in cues, rewards, and opportunities and that people vary in cognitions, abilities and motivation (Terborg, 1981). To understand IT use at the individual level, many scholars have argued that we must account for, and model, the influence of situational variables and personal variables (Nelson, 1990).

In terms of the context, we control for the social environment through examining a specific situation – the classroom – and examine the influence of a distinct attribute of Internet technologies – multi-tasking (MULTI). To model the influence of personal variables, we examine the influence of two individual variables (CA and SN) on ITS. Then, we use Personal Innovativeness with Information Technology (PIIT) to control for the influence of individual difference’s on CA as well as SN.

The following sections explain the logic behind the selection of each construct and more explicitly maps the nomological network among constructs.

Technology Effectiveness

Students reap greater learning benefits in the classroom if they use technology effectively. Hence, in this study, we focus on understanding influences on effective uses of Internet technology. We define technology effectiveness as “the use of Internet technologies for their intended learning purpose in the classroom.” We use TE as a measure of an individual’s use of Internet technology.

Predicting Technology Effectiveness through Intention to Cyber-Slack

When in a classroom environment, the psychology literature suggests that “group” nature of the context provides students the opportunity to “loaf” or “slack”. The social loafing literature provides a useful explanation of this phenomenon. Social loafing leads to a reduction in motivation and effort when individuals work collectively compared to when they work individually (Karau and Williams, 1993). The core observation of this literature is that individuals take advantage of getting “lost in a crowd” – due to how outcomes are measured or anonymity created by the context (Latane et al., 1979). Germane to understanding individual slacking in the classroom, our review also derives from a more recent addition to MIS literature, cyberloafing. Cyberloafing refers to employees use of the Internet for non-work related purposes (Lim et al., 2002).

Within the context of the classroom, our review of the social loafing and cyberloafing literature suggests that examining intentions towards Internet technologies may predict TE. Specifically, in light of social loafing and the minimizing opportunities provided by the Internet, we focus our attention on intention to cyber-slack (ITS). ITS

refers to whether one intends to use Internet technologies for non-class related purposes during class meetings.

Based on our review of the literature, we hypothesize that ITS will negatively correlate of technology effectiveness. When one intends to use Internet technologies for non-class related purposes, one will be less likely to use Internet technologies for learning in the classroom. Hence: *Hypothesis 1: Intention to Cyber-Slack negatively affects Technology Effectiveness.*

Predicting ITS

Although the classroom provides opportunities for slacking, our review of the literature provides scant explanation for why individuals “slack” using Internet technologies. Therefore, we return to our theoretical lenses of TPB and the Interactional Model.

Subjective Norms

Subjective norms (SN) refers to the degree to which an individual believes that people who are important to them think that they should perform that behavior in question (Azjen, 1991), or more importantly it is the degree to which friends, family and peers influence an individual’s behavior. Rooted in psychology literature, subjective norm was designed to capture the social pressures involved in performing a behavior in order to aid in predicting the intention (Azjen, 1991).

Consistent with prior research, we posit that when an individual reports that people who influence their behavior condone slacking with Internet technologies in classroom, they will be more likely to form the intention to cyber-slack with Internet technologies. Hence: *Hypothesis 2: Subjective Norms positively affects the Intention to Cyber- Slack.*

Cognitive Absorption

Cognitive Absorption (CA) refers to a *state* of deep involvement with an individual task. CA is a personal factor that helps us understand individuals’ intentions and uses of information technology. CA captures a broad range of feelings including control, curiosity, heightened enjoyment, focused immersion, and temporal dissociation (Agarwal and Karahanna, 2000). Table 1 defines each of these dimensions with respect to CA.

In the context of this study, CA refers to the state of deep involvement with Internet technologies. Internet technologies are designed to encourage CA. For instance, when engrossed in IM or email, individuals may experience states of pleasure, which increases the likelihood they will “loaf” or “slack” with the Internet in the future.

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.
*Source: Agarwal and Karahanna (2000)	
Table 1: Dimensions of CA	

Although applications of “gaming” or using “IM” are not necessarily counterproductive, we believe that prior experiences of CA may predispose individuals to slack with IT. A student who has previously experienced CA using Internet technologies will be more likely to form the ITS. Hence: *Hypothesis 3: Cognitive Absorption positively affects the Intention to Cyber- Slack.*

Multi-tasking

Multi-tasking (MULTI) refers to the simultaneous or consecutive use of Internet applications during scheduled class times by a student. MULTI is a situational construct that measures the depth of Internet application use in the classroom. In contrast to multi-tasking many physical activities at once, which needs an abundance of physical energy; multi-tasking with Internet applications may require high levels of cognitive effort to achieve.

Once the individual multi-tasks, the individual may grow more cognitively absorbed with Internet applications. Therefore, when an individual considerably multi-tasks, they are no longer aware of outside activities, which encourages the rate of absorption into the Internet technologies. Hence: *Hypothesis 4: Multi-tasking positively affects Cognitive Absorption.*

Personal Innovativeness with Information Technology

Innovativeness is a personality trait measuring an individual's willingness to adopt on a continuum from high to low for each individual. PIIT is a direct descendent of innovativeness; however, its focus is on the adoption of technology.

Like cognitive absorption, personal innovativeness is a personal factor. However, where CA refers to an intense state of being, personal innovativeness refers to a relatively enduring predisposition to innovate or experiment with new situations. Therefore, PIIT refers to an individual's willingness to experiment with any new technology (Agarwal and Prasad, 1998). In the MIS literature, PIIT has been well-established as a predictor of CA (Agarwal and Karahanna, 2000). Individuals high on PIIT are more likely to encounter a heightened experience of CA. Hence: *Hypothesis 5: Personal Innovativeness positively affects Cognitive Absorption.*

PIIT may also influence SN. To date, research has not tested the direct link between PIIT and SN. However, we suspect that highly innovative individuals will be less prone to peer-influence. Within the Marketing literature, a study regarding the interactions between predispositions

and social messages has tested innovativeness' relationship with social influences, and adoption of new products and found that people who were highly innovative were less likely to listen to peers than the lower segments of innovativeness (Midgley and Dowling, 1993). Therefore, we expect that as levels of PIIT grow, individuals will report lower levels of SN. Hence: *Hypothesis 6: Personal Innovativeness negatively affects Subjective Norm*

METHODOLOGY

Sample Characteristics

We collected data from students at a large university in the southeastern United States. In our instrument, we clearly defined Internet technologies as including instant messaging (IM), emailing, surfing the Web, online banking, file transfer protocol (FTP), and Internet gaming. A total of 128 students participated in the study. After the listwise deletion for missing cases, we were left with a sample of 117 observations, representing almost all the students in each class.

Operationalization of Research Variables

Cognitive absorption was measured using Agarwal and Karahanna's (2000) scale. Personal innovativeness was measured using Agarwal and Prasad's four item scale (1998). Subjective norms was taken from Venkatesh and Morris (2000) and measured based on their two item scale. Scales were modified to reflect the context of each construct within Internet technologies.

Scales to measure technology effectiveness, intention to cyber-slack and multi-tasking were developed through a multi-stage process to create content validity. Items directed their attention to the specific context of Internet technology use. TE and ITS each resulted in a 3 item scale, while MULTI was measured by a 4 item scale. Each item was answered on a five point likert scale, with strongly agree, neither agree or disagree, and strongly disagree as anchors.

Results

To test our empirical model, we used Partial Least Squares (PLS). PLS is a latent structural equation modeling technique. In this study, PLS is useful because of our relatively small sample size (N=117). Also, PLS is a useful tool because it handles the ability to model formative constructs (Chin, 1998). Hence, PLS was an appropriate choice for evaluating our research model.

We evaluated the psychometric properties of the measures. Internal consistencies along with convergent and discriminant validity, which is highly appropriate for reflective measures, are inappropriate for formative measures (Wixom and Watson, 2001). Instead, the weights can be examined to measure the relevance the items have to the research model.

TE, ITS, SN, MULTI and PIIT were operationalized as reflective constructs. Properties of the constructs are

assessed in terms of item loadings, discriminant validity, and internal consistency. We conducted a confirmatory factor analysis (CFA) in which all of the items loaded on their appropriate measure and met Comrey and Lee's (1992) *excellent* threshold of .71 except three: PIIT2, MULTI3 and MULTI4. However, each of the three lowest items were still very much above Comrey and Lee's (1992) *good* threshold.

CA was measured as a formative construct, because it is 2nd ordered in nature and has dimensions that do not correlate with one another. Therefore weights were evaluated to see their relationship with one another. CAHE, CAC and CATD were found to be a significant contributor to intent to slack ($p < .01$; $< .01$; $< .05$). While the other two dimensions CAFI and CACTL did not show significance.

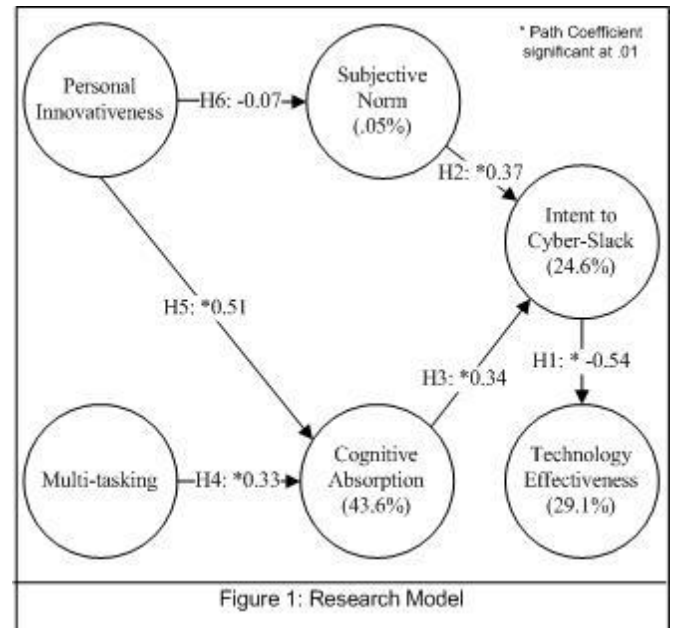
	# of Items	TE	ITS	SN	CA HE	CA C	CA TD	CA FI	CA CTL	PIIT	MULTI
TE	3	<u>0.86</u>									
ITS	3	-0.5	<u>0.9</u>								
SN	2	-0.4	0.4	<u>0.9</u>							
CAHE	4	-0.1	0.3	0.09	<u>0.82</u>						
CAC	3	0.05	0.2	0.02	0.51	<u>0.92</u>					
CATD	5	-0.1	0.4	-0.1	0.46	0.34	<u>0.74</u>				
CAFI	5	-0.1	0.2	0.18	0.25	0.37	0.32	<u>0.63</u>			
CACTL	3	0.05	0.1	0.05	0.3	0.46	0.43	0.32	<u>0.72</u>		
PIIT	4	0.07	0	-0.1	0.45	0.55	0.35	0.3	0.45	<u>0.8</u>	
MULTI	4	-0.5	0.6	0.26	0.41	0.35	0.37	0.33	0.23	0.21	<u>0.74</u>

The shaded numbers on the leading diagonal are the square root of the 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.

Table 2: Inter-Construct Correlations

The average variance extracted (AVE) of each construct were examined. Table 2 shows discriminant validity of the constructs by taking the square root of the AVE. In this case the AVE should be greater than inter-construct correlations. As shown, each construct shares more variance with their respective indicators than with other constructs. Thus, our results point to convergent and discriminant validity and enhance the accuracy of our newly developed scales of TE, ITS, and MULTI.

Figure 1 presents the final PLS results. Paths can be interpreted as regression beta coefficients. Path coefficients along with explained variance (R^2) are included in the model.



In regards to hypothesis 1, ITS was confirmed to negatively affect TE with a path coefficient of $-.54$ ($p < .01$). Hypothesis 2, which stated that SN would positively affect ITS, was found significant ($p < .01$) with a path coefficient of $.37$. Hypothesis 3, which posited that CA positively affects ITS, derived a path coefficient of $.34$ also significant at $.01$. In hypothesis 4, MULTI affected CA with a path coefficient at $.33$ ($p < .01$). Hypothesis 5, PIIT affecting CA was found with a path coefficient of $.51$ ($p < .01$). Hypothesis 6, that PIIT negatively affected SN was the only path not significant in the model.

The predictor ITS explained 29.1% of the variance of our dependent variable, TE. CA and SN explain 24.6% of the variance within ITS. MULTI and PIIT explain 43.6% of the variance within CA. MULTI was also executed in the model without the support of PIIT to see the direct contribution to the explained variance of CA. Alone, MULTI was found to explain 21.5% of the variance significant at the $.01$ level, which indicated a significant contribution to the explanation of CA. PIIT only explained 0.5% of the variance which was significantly weak, holding true to the path coefficient's non-significance.

LIMITATIONS

Our research is based on behavioral choices with technology and how the focus of Internet technologies in the classroom occurs. Prior to discussing the implications of this study, it is important to consider the limitations of this research. The data was collected at one point in time, making assertions about causality inappropriate. In future studies, researchers should collect longitudinal samples, especially as more schools become wireless equipped, and test the validity of our research model. Also, while the sample size are well above the minimum requirements to use PLS, a larger sample could provide the opportunity to

conduct omnibus tests of the research model using tools such as ML SEM.

IMPLICATIONS

Our research has a number of implications. In regard to theoretical implications, our research developed and empirically validated 3 new constructs: technology effectiveness, intention to cyber-slack and multi-tasking. Technology effectiveness was developed as a dependent variable addressing the behavior of how students use technology in the classroom. The antecedent to this variable was linked to explain the relationship with using a technology effectively and the intention to do so. Our results confirm that a negative relationship exists between intention to cyber-slack and technology effectiveness.

To explain ITS, we examined subjective norm and cognitive absorption. In regard to SN, our analysis suggests that perceptions of relevant peers influence one's intention to cyber-slack. Our second focus was on the state of cognitive absorption influencing the intention to cyber-slack. We found that individuals who report cognitive absorption when using Internet technology are more likely to slack.

Although this study focuses on the classroom context, our findings may be germane to practice. When employees have access to diverse applications such as file sharing, instant messaging, or webmail accounts, they may be more likely to multi-task, slack, and use technology less effectively. Because managers may not have time to monitor each employee, "slacking" employees may take advantage from the feeling of being lost in the crowd. We recommend a strategy using "structural techniques" to limit slacking at work, such as closing network holes that limit access to non-sanctioned sites and Internet applications such as Instant messaging. Also, we perceive extending this research to the workplace an important direction for future research.

CONCLUSION

The goal of this paper was to help understand the behavior of students with Internet technologies. We focus on the effective use of technology, and how students intend to use Internet technologies for alternate purposes other than learning. We understand this phenomenon is occurring by the rate of cognitive absorption and subjective norm the individual has with the technology. Given the practicality that the Internet is still dispersing more readily throughout our schools, we discuss reasons why we should learn to control the attention of our students. Our research provides avenues for future researchers, which we hope benefit from our findings.

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