Correlates of Computer Self-Efficacy among Undergraduate Business Majors

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ABSTRACT

This study empirically investigates the relationship between computer self-efficacy and a number of hypothesized antecedents: general self-efficacy, personal innovativeness, computer anxiety, academic self-esteem, and locus of control. A total of 130 undergraduate business majors completed a questionnaire survey measuring their response to the study constructs. For all study constructs there were no statistically significant differences between the scores of males and females. Computer self-efficacy positively correlated with each of general self-efficacy, personal innovativeness, computer anxiety, and academic self-esteem. Furthermore, students with an internal locus of control tended to report higher levels of computer self-efficacy than those with an external locus of control. These results conform to results reported in earlier studies investigating the correlates of computer anxiety. This study contributes to the growing literature on the correlates of computer-self efficacy by providing further empirical evidence for the relationship between computer self-efficacy and other variables.

Keywords: Computer, self-efficacy, innovativeness, anxiety, self-esteem, locus of control.

INTRODUCTION

To say that modern organizations are highly dependent upon information systems and technologies has become something of a cliché. Not surprisingly, there is a large and growing body of research devoted to the determinants of information technology acceptance in organizational settings. Much of this research draws from Fred Davis's (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989) Technology Acceptance Model (TAM). According to TAM, two key determinants of system use and – by extension – system acceptance, are perceived usefulness and perceived ease of use of the system under consideration: when users consider a system to be both useful and easy to use, they are likely to want to use it, and should ultimately use it. In general, TAM has been widely supported by empirical studies (see, for instance, the meta-analytic reviews by Schepers & Wetzels 2007 and King & He 2006).

Acknowledging the usefulness of TAM, Venkatesh and Davis (1996) argued that it was important to go further and identify the antecedents of perceived ease of use. They postulated that computer self-efficacy would be an important predictor of ease of use. Indeed, the results from their study supported their hypothesis, leading these researchers to conclude that "an individual's perception of a particular system's ease of use is anchored to his or her ... computer self-efficacy at all times" (Venkatesh & Davis 1996, p. 451). More recent studies have also found computer self-efficacy to be an important predictor of perceived ease of use (Chan & Lu, 2004; Guriting & Ndubisi, 2006, Amin, 2007; Seyal & Rahman, 2007). Computer self-efficacy has also been shown to be related to a number of other variables that themselves influence the acceptance and use of information technology: interest in

information technology (Smith, 2002), perceived behavioural control (Thompson, Compeau, & Higgins, 2006), organizational commitment (Stone & Henry, 2003) and the learning and use of computers (Lowe & Holton, 2005).

Granted, computer self-efficacy plays an important role in the acceptance and use of computer-based systems, but what are its antecedents? Drawing from the empirical literature on the correlates of computer self-efficacy, this study develops and tests a simple model in which general self-efficacy, personal innovativeness, computer anxiety, locus of control, and academic self-esteem are postulated to individually and collectively influence computer self-efficacy.

COMPUTER SELF-EFFICACY

Computer self-efficacy may be considered a more targeted form of self-efficacy, which in turn is a core component of Albert Bandura's Social Cognitive Theory (SCT) (see, for example, Bandura, 1989). SCT maintains that "any account of the determinants of human action must … include self-generated influences as a contributing factor" (Bandura 1989, p.1175). One such self-generated influence is self-efficacy, "a person's estimate of his or her capacity to orchestrate performance on a specific task" (Gist & Mitchell 1992, p.183). As Wood and Bandura (1989, p.364) put it, self-efficacy "concerns people's beliefs in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in their lives". Bandura (1991, p.257) argues that "among the mechanisms of personal agency, none is more central or pervasive than people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives". Indeed, the meta-analytic review by Stajkovic and Luthans (1998) concluded that self-efficacy was robustly correlated with work performance.

Efficacy expectation differ in generality: "some experiences create a circumscribed mastery of expectations" while "others instil a more generalized sense of efficacy that extends well beyond the specific treatment situation" (Bandura 1977, p.194). Information systems researchers (e.g. Compeau & Higgins, 1995) have focused their attention on – and operationalised – the narrower concept of *computer* self-efficacy. Formally, computer self-efficacy is defined as "a judgement of one's capability to use a computer", and "is not concerned with what one has done in the past, but rather with judgements of what could be done in the future" (Compeau & Higgins, 1995, p.192).

RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

The research model guiding this study is depicted in Figure 1. Antecedents of computer self-efficacy were identified during a review of the empirical literature on computer self-efficacy. In the following sections, the relationship between each of the identified antecedents of computer self-efficacy and computer self-efficacy itself are discussed, and the hypothesis to be tested developed.

General self-efficacy

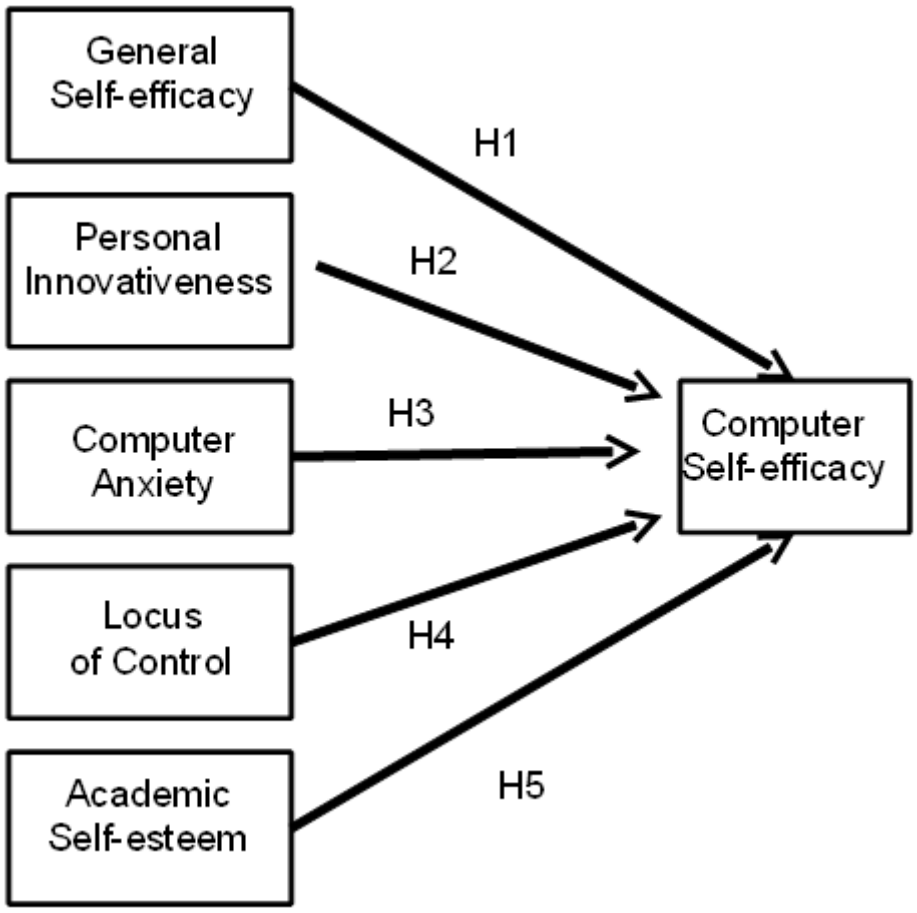
Self-efficacy may be "generalised" or "circumscribed" (Bandura, 1977). Intuitively, the idea that circumscribed self-efficacy may be positively related to generalised efficacy, with the former emanating from the latter, is quite appealing. Indeed, Paraskeva, Bouta, and Papagianni (2008:1085) argue that "computer self-efficacy is based on an already formed sense of self-efficacy and represents its fundamental elements applied in the fields of use and mastery of computers". Empirically, it has been shown that high levels of general self-

efficacy are associated with high levels of computer self-efficacy (Paraskeva, Bouta, & Papagianni, 2008; Looney, Valacich, & Akbulut, 2004).

In the present study, therefore, we hypothesise as follows:

H1: General self-efficacy is positively correlated with computer self-efficacy.

Figure1: Conceptual framework



Personal innovativeness

The construct "personal innovativeness in the domain of information technology", hereafter referred to as personal innovativeness for short, was first introduced by Agarwal and Prasad in their 1998 paper. Formally, they defined it as follows: "the willingness of an individual to try out any new information technology" (Agarwal & Prasad 1998:206). In essence, Agarwal and Prasad's work was an extension of models such as the theory of reasoned action (Fishbein & Ajzen, 1975) and the technology acceptance model (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989) both of which did not specifically address the role of individual differences in the uptake of new technology: it was Agarwal and Prasad's contention that "the inclusion of an important individual difference variable – personal innovativeness with respect to information technology – would help us further understand both how perceptions are formed and the subsequent role they play in the formation of usage intentions" (p. 205).

Empirically, personal innovativeness has generally been found to be a robust predictor of computer self-efficacy (Thompson, Compeau, & Higgins, 2006; Thatcher & Perrewé, 2002; Agarwal, Sambamurthy, & Stair, 2000), although the study by Klein (2007) suggests that the direction of influence may also go the other way, with computer self-efficacy influencing personal innovativeness. In the present study, therefore, we hypothesise as follows:

H2: Personal innovativeness is positively correlated with computer self-efficacy.

Computer anxiety

Computer anxiety refers to "fears about the implications of computer use such as the loss of important data or fear of other possible mistakes" (Thatcher & Perrewé 2002, p.384), or, simply, "the fear or apprehension experienced by individuals in the course or at the thought of using computers" (Arigbabu 2009, p.230). In general, computer anxiety appears to be robustly negatively correlated to computer self-efficacy. Using data from students at an American university, Thatcher and Perrewé (2002) investigated the relationships among individual traits, computer anxiety and computer self-efficacy. The research model tested in this study suggested that computer anxiety would predict computer self-efficacy. The model was subjected to structural equation modelling, and the study reported a statistically significant inverse relationship between computer anxiety and self-efficacy. The earlier study by Brosnan (1998) had also reported a similar relationship between computer anxiety and self-efficacy. In the present study, therefore, we hypothesise as follows:

H3: Computer anxiety is negatively correlated with computer self-efficacy.

Locus of control

According to Phillips and Gully (1997, p.795), locus of control is "a personality attribute reflecting the degree to which one generally perceives events to be under their control (internal locus) or under the control of powerful others (external locus)". Citing the earlier work of Rotter (1992) and Wood and Bandura (1989), Phillips and Gully argued that people with an internal locus of control were more likely to have a higher self-efficacy that people with an external locus of self-control: Rotter had suggested that an external locus of control would be associated with passivity and learned helplessness, while Wood and Bandura had reported some association between perceived environmental controllability and self-efficacy. In their study, Phillips and Gully did report a positive association between (internal) locus of control and self-efficacy. Similarly, in a survey of beginning information systems students, Langford and Reeves (1998) reported that individuals with higher levels of internal locus of control reported higher levels of computer self-efficacy. Consequently, we hypothesise as follows:

H4: Locus of control is related to computer self-efficacy, with individuals with higher levels of internal locus of control more likely to report higher levels of computer self-efficacy.

Academic Self-esteem

Self-esteem refers "most generally to an individual's overall positive evaluation of the self" (Cast & Burke 2002:1042). It is related to, but different from, self-efficacy. Gist and Mitchell (1992, p.85) distinguish between the two in the following manner: self-esteem "usually is considered a trait reflecting an individual's characteristic, affective evaluation of the self (e.g. feelings of self-worth or self-liking)", while self-efficacy "is a judgement about task capability that is inherently evaluative".

Intuitively, one would expect individuals with a high self-esteem to be more confident of their abilities than individuals with a low self-esteem; as Sharma and Mavi (2001) point out, low self-esteem engenders uncertainty about one's ability and skill to achieve one's goals. Langford and Reeves (1998, p.42) persuasively argued that "although self-esteem is not the same as self-efficacy, it should be associated with computer self-efficacy … [since] … individuals with low self-esteem often suffer from anxiety in task-performance situations because they are so focused on their inadequacies". Surprisingly, though, in their study involving upper division university business students, computer self-efficacy and self-esteem did not appear to be related. Similarly disappointing results were reported by the more recent study undertaken by Paraskeva, Bouta, and Papagianni (2008).

Paraskeva, Bouta, and Papagianni (2008) suggest that the reason studies have failed to detect any relationship between self-esteem and computer self-efficacy is because their measurement of self-efficacy was too general i.e. self-esteem was considered global and context-free. In this study, we investigate the relationship between the narrower concept of academic self-esteem (as opposed to 'global' self-esteem) and computer self-efficacy, and hypothesize as follows:

H5: Academic self-esteem is positively correlated with computer self-efficacy.

METHODOLOGY

Sample

The participants in the study were second year undergraduate students enrolled in the Faculty of Business at the University of Botswana. These students were registered for degree programs in Accounting, Finance, Marketing, and Management. All students had taken two computer literacy courses in their first year, and, at the time of study, were taking an introductory Information Technology (IT) course. Although students were urged to participate, they were also informed that their participation was entirely voluntary. A total of 280 questionnaires were distributed, of which 130 usable questionnaires were returned. Of these 84 (65%) were female while 45 (35%) were male. For all the six constructs in the study, analysis of variance (ANOVA) did not detect any differences in the scores for males and females.

Measurement Development and Validation

Computer Self-efficacy

All theoretical constructs were measured using pre-existing scales. Computer self-efficacy was measured using an instrument borrowed from Henry and Stone (1997, 1999). The original instrument was intended to measure computer self-efficacy in a work context, and included items such as "At work, I feel more competent with the computer system than most other people". To make the scale meaningful in the context of the current study, where necessary, items were modified to reflect the fact that for the current study, respondents were students rather than employees. For instance, the previously cited item became: "At school, I feel more competent with computers than most other students". Furthermore, all references to 'computer system' were replaced with the single word 'computers' to avoid potentially confusing the respondents who do not have access to a single central computer system, but use various computers in various computer laboratories as well as in the Library and – in some cases – at home.

Personal Innovativeness in the Domain of Information Technology

Personal innovativeness in the domain of information technology (PIIT) was measured using the scale developed by Agarwal and Prasad (1998), which consists of four items: "If I heard about a new information technology, I would look for ways to experiment with it"; "Among my peers, I am usually the first to try out new information technologies"; "In general, I am hesitant to try out new information technologies"; and "I like to experiment with new information technologies".

Academic self-esteem

Academic self-esteem was measured using the seven-item scale in McInerney, Dowson, Yeung and Nelson (2005). Items include: "I am very confident at school"; "I think I can do quite well at school"; and "Most of the time I feel that I can do my schoolwork". The items appeared appropriate for university level students, and the scale was thus used as is.

Computer anxiety

Computer anxiety was measured using four items drawn from the Computer Anxiety Rating Scale (CARS) developed by Heinssen, Glass and Knight (1987). The initial CARS scale had 19 items. However, when Compeau and Higgings (1995) subjected it to factor analysis they found it to be multi-dimensional, with only four items forming the core of the anxiety sub-dimension. Thatcher and Perrewé (2002) used these four items as a measure of computer anxiety, reporting a composite reliability of 0.94. The items on this scale are: "I feel apprehensive about using computers"; "it scares me to think that I could cause the computer to destroy a large amount of information hitting the wrong key"; "I hesitate to use a computer for fear of making mistakes that I cannot correct"; and "computers are somewhat intimidating to me". These items constituted the computer anxiety scale used in the current study.

Locus of control

Ross and Broh (2000) selected five items from the Pearlin mastery scale (Pearlin, Menaghan, Lieberman & Mullan, 1981) to create a short and reliable locus of control scale: (1) "When I make plans I am almost certain I can make them work" (this item is reverse-coded); (2) "I don't have enough control over the direction my life is taking"; (3) "In my life, good luck is more important than hard work for success"; (4) "Every time I try to get ahead, something or somebody stops me"; and (5) "My plans hardly ever work out, so planning only makes me

unhappy". A *high* summated score (i.e. overall agreement with the instrument items) indicates a *low* perception of self-control i.e. *external* locus of control. This scale was used to measure locus of control in the current study.

General self-efficacy

General self-efficacy was measured using the instrument developed by Chen and colleagues (Chen, Gully, & Eden, 2001) referred to as the New General Self-Efficacy (NGSE) scale to differentiate it from the older Sherer et al. (1982) General Self-Efficacy Scale. The scale consists of eight items, including the following: "I will be able to successfully overcome many challenges", and "Even when things are tough I can perform quite well". One item was modified slightly to clarify its meaning: the original item read "I believe I can succeed at most any endeavor to which I set my mind", and it was modified to read: "I believe I can succeed at any assignment to which I set my mind".

RESULTS

Measurement validity

Cronbach's coeffient α (Cronbach, 1951) was used to test the reliability of the measuring scales (see Table 1). In the case academic self-esteem, Cronbach's α was a healthy 0.87. For computer anxiety, reliability analysis indicated that dropping the first item ("I feel apprehensive about using computers") would improve α from 0.67 to 0.80; it would appear that students – who are not mother tongue speakers of English – were unsure of the meaning of the word "apprehensive", and as such the item was dropped from the scale. At 0.59, Cronbach's α for locus of control was lower than the commonly used 0.70 cut-off point (see Field, 2005), though perhaps not disastrously so. In the case of general self-efficacy, coefficient α was a robust 0.91 will all scale items included. For PIIT, reliability analysis with item 3 reverse-worded yielded a coefficient α of 0.71. Cronbach's coefficient α for computer self-efficacy was 0.79.

Table 1: Means, standard deviations, reliability and correlation analysis results

		Mean	SD	α	1	2	3	4	5
1	**ACSE**	14.45	3.86	0.87					
2	**COAN**	9.33	2.16	0.80	-0.27**				
3	**LOCO**	12.61	2.14	0.59	-0.50**	0.27**			
4	**NGSE**	14.98	3.84	0.91	0.68**	-0.31**	-0.52**		
5	**PIIT**	10.35	2.29	0.71	0.39**	-0.29**	-0.25**	0.29**	
6	**COSE**	10.31	2.51	0.79	0.47**	-0.31**	-0.27**	0.36**	0.37**

** Correlation is significant at the 0.01 level (2-tailed).

ACSE: Academic Self-Esteem; COAN: Computer Anxiety; LOCO: Locus of control; NGSE: General Self-Efficacy; PIIT: Personal Innovativeness in the domain of IT; COSE: Computer Self-Efficacy.

Hypothesis testing

Table 1 also shows the correlations among the different constructs in this study. All hypotheses were supported (all at the $p < 0.01$ level): general self-efficacy was positively correlated ($r = 0.36$) with computer self-efficacy (H1); personal innovativeness was positively

correlated (r = 0.37) with computer self-efficacy (H2); computer anxiety is negatively correlated (r = -0.31) with computer self-efficacy (H3); locus of control is related to computer self-efficacy (r = -0.27) , with individuals with higher levels of internal locus of control more likely to report higher levels of computer self-efficacy (H4); and academic self-esteem is positively correlated (r = 0.47) with computer self-efficacy (H5).

Regression analysis

Multiple linear regression was used to test the model depicted in Figure 1 (see Table 2). The value of R^2 (adjusted) is 0.24 suggesting that the linear combination of all the predictor variables accounts for only 24% of the variance in the independent variable. Acknowledging that in regression there are no absolute standards for what constitutes an acceptable model fit, Lattin, Carroll and Green (2003) note that in the social sciences R^2 typically ranges between 0.1 and 0.5, which would seem to suggest a fairly good fit for our model. However, as can be seen from Table 2, none of the model coefficients is statistically significant even at the 5% level. Furthermore, multicollienarity does not appear to be a problem, since none of the variance inflation factors (VIF) exceeds the 10.0 threshold suggested by Hair, Anderson, Tatham and Black (1998). Thus, it would seem that the model itself is poorly specified and can therefore not be used to predict computer self-efficacy.

Table 2: Regression analysis results, with computer self-efficacy as dependent variable

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	**Std. Error**	**Beta**	**t**	**Sig.**	**Tolerance**	**VIF**
Constant	7.282	2.448		2.975	0.004		
ACSE	0.209	0.074	0.332	2.829	0.006	0.464	2.156
COAN	-0.181	0.100	-0.159	-1.817	0.072	0.834	1.200
LOCO	-0.018	0.088	-0.021	-0.210	0.834	0.670	1.492
NGSE	-0.004	0.076	-0.006	-0.052	0.959	0.475	2.105
PIIT	0.200	0.093	0.192	2.160	0.033	0.812	1.231

ACSE: Academic Self-Esteem; COAN: Computer Anxiety; LOCO: Locus of control; NGSE: General Self-Efficacy; PIIT: Personal Innovativeness in the domain of IT; COSE: Computer Self-Efficacy.

DISCUSSION, IMPLICATIONS & FURTHER RESEARCH

This study investigated the relationship between computer self-efficacy and a number of potential predictors gleaned from the empirical literature. As per the study hypotheses, general self-efficacy, personal innovativeness, computer anxiety, locus of control and academic self-esteem were all found be related to computer anxiety. These results are similar to those reported in the literature. For instance, a number of other studies (Paraskeva, Bouta, & Papagianni, 2008; Looney, Valacich, & Akbulut, 2004) have reported a positive correlation between general self-efficacy and computer self-efficacy. These results are hardly surprising: the core of self-efficacy, whether generalised or circumscribed, is one's confidence in one's abilities, and a high opinion of one's abilities in general is likely to translate to a high opinion of one's abilities in specific domains. As Paraskeva et al. (2008) note, individuals with a high general self-efficacy are more likely to embrace new innovations and technologies than those with a lower general self-efficacy.

The finding in the present study that personal innovativeness is positively correlated to computer self-efficacy is in agreement with results reported elsewhere in the literature (e.g. Thompson, Compeau & Higgins, 2006; Thatcher & Perrewé, 2002; Agarwal, Sambamurthy & Stair, 2000). Personal innovativeness measures one's willingness to experiment with new technologies: individuals high on innovativeness are more likely to be willing to experiment with new technology. Willingness to experiment with new technology is likely to be founded upon the belief in one's ability to successfully operate the technology in question. More specifically, personal innovativeness in the domain of information technology – the construct measured in the current study – will likely be based on one's confidence in one's ability to operate computers and other information technology artefacts i.e. computer self-efficacy.

Individuals scoring high on computer anxiety can be expected to score low on computer self-efficacy. Indeed, this study, like others before it (Thatcher & Perrewé, 2002; Brosnan, 1998), found computer anxiety to be negatively correlated with computer self-efficacy. Although the current study is correlational in nature and cannot therefore be used to ascribe the direction of influence between computer anxiety and computer self-efficacy, it nevertheless seems plausible that people bubbling excitement about using computers do so precisely because of their belief in their ability to use computers. Of course, the converse might also be true: computer self-efficacy reduces computer anxiety because once you are confident of your ability to operate computers you no longer have a reason to fear them.

The findings of the present study (i.e. that individuals with higher levels of internal locus of control tend to have higher levels of computer self-efficacy) are in agreement with those reported by Langford and Reeves (1998). Locus of control measures the degree to which an individual believes they can influence events: individuals who believe that events are under their own control are said to have an internal locus of control while those who believe events to be subject to the control of powerful others are said to have an external locus of control. Precisely because of their belief in their ability to influence events, individuals with an internal locus of control should be expected to score high on computer self-efficacy i.e. their internal locus of control leads them to believe that they can successfully interact with computers without help from powerful others.

Self-esteem is related to one's certainty about one's ability and skill to achieve one's goals, and should be expected to be related to computer self-efficacy since, as Langford and Reeves (1998) argued, individuals with low self-esteem often suffer from anxiety in task-performance situations because they are focused on their inadequacies. While previous studies failed to detect any relationship between self-esteem and self-efficacy Paraskeva, Bouta, and Papagianni (2008) suggested that the reason for that might be that the measures of self-esteem used in those studies were too general. Indeed, when the present study tested the relationship between the much narrower concept of academic self-esteem and computer self-efficacy, the two were found to be positively correlated. In today's academic environments, the ability to successfully interact with computers is itself a required component of doing well academically. Consequently one would expect that when a student says that they believe they can do quite well at school, and that they are generally pleased with their performance at school, they also, by extension, imply that they are quite confident of their ability to interact with computers.

These results have important implications for academic establishments. In particular, they would seem to favour a teaching and learning approach that is problem-solving oriented and views a student as an active seeker and creator – rather than passive receiver – of knowledge. Such an approach would be more likely to develop high levels of general self-efficacy and self-esteem, as well as encourage a more internal locus of control. Such an approach would be even more useful when student exercises include substantial doses of computer-based tasks, and students are encouraged (perhaps even rewarded!) to experiment

with technology. It is also worth noting that for all the six constructs measured in this study (computer self-efficacy, personal innovativeness in the domain of IT, academic self-esteem, computer anxiety, general self-esteem, and locus of control), there were no statistically significant differences in the mean scores for males when compared to females. In other words, when seeking to influence any of these variables among students, it would not be necessary to launch different interventions for males and females.

As is true of virtually any research endeavour, this study suffers from a number of limitations. Firstly, the data used in the study were collected via self-reports using a questionnaire composed of measures for all the variables in the study. As such, common method variance may have been a problem. Another shortcoming of the study is its use of a non-probabilistic sampling approach, which thus limits the generalisability of the study findings. Future studies would do well to address these shortcomings. The shortcomings notwithstanding, this study contributes to the literature on both computer self-efficacy and technology acceptance by empirically testing the relationship between computer self-efficacy and a number of its correlates using a sample drawn from a developing Southern African context that remains under-researched.

CONCLUSIONS

Computers are ubiquitous not just in academia, but also in the workplace, in homes, and even in entertainment centres. As such, studies that investigate the predictors of computer use remain important. The present study investigated the relationships between computer self-efficacy and a number of its hypothesized antecedents, namely, general self-efficacy, personal innovativeness in the domain of information technology, computer anxiety, locus of control, and academic self-esteem. Based on the findings of this study, these variables appear to play a role in the development of computer self-efficacy, and interventions that seek to engender computer self-efficacy among college students in particular and the wider community at large would do well not to ignore these variables.

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APPENDIX A
Measuring instruments

Computer Self-Efficacy [Source: Slightly modified from Henry and Stone (1997, 1999)]
1. At school, I feel more competent with computers than most other students
2. I know enough about computers to get my school work done
3. Compared to other students, I know a lot about computers
4. I use computers as much as possible

Personal Innovativeness in the domain of IT [Source: Agarwal and Prasad (1998)]
1. If I heard about a new information technology, I would look for ways to experiment with it
2. Among my peers, I am usually the first to try out new information technologies
3. In general, I am hesitant to try out new information technologies (R)
4. I like to experiment with new information technologies

Academic Self-Esteem [Source: McInerney et. al. (2005)]
1. On the whole I'm pleased with myself at school
2. I can do things as well as most other people at school
3. I am very confident at school
4. I think I can do quite well at school
5. I succeed at whatever I do at school
6. I think I'm as good as everybody else at school
7. Most of the time I feel that I can do my schoolwork

Computer Anxiety [Source: Compeau and Higgins (1995)]
1. I feel apprehensive about using computers
2. It scares me to think that I could cause the computer to destroy a large amount of information by hitting the wrong key
3. I hesitate to use a computer for fear of making mistakes I cannot correct
4. Computers are somewhat intimidating to me

General Self-Esteem [Source: Chen, Gully, and Eden (2001)]
1. I will be able to achieve most of the goals that I have set for myself
2. When facing difficult tasks, I am certain that I will accomplish them
3. In general, I think that I can obtain outcomes that are important to me
4. I believe I can succeed at any task to which I set my mind
5. I will be able to successfully overcome many challenges
6. I am confident that I can perform effectively on many different tasks
7. Compared to other people, I can do most tasks very well
8. Even when things are tough, I can perform quite well

Locus of Control [Source: Ross and Broh (2000)]
1. When I make plans, I am almost certain I can make them work (R)
2. I don't have enough control over the direction my life is taking
3. In my life, good luck is more important than hard work for success
4. Every time I try to get ahead, something or somebody stops me
5. My plans hardly ever work out, so planning only makes me unhappy.