Technophobia and the Filipino Worker

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A survey of 137 workers in five Philippine organizations was made to determine the manifestations and antecedents of technophobia. Technophobia was measured in terms of computer anxiety, thoughts and attitudes. In terms of computer anxiety, 31 percent of workers had scores that would classify them as highly or moderately technophobic. However, in terms of computer thoughts, only 3 percent reported high technophobia. A matrix was developed classifying individuals into: technophobes, computer skeptics, reluctant users and computer enthusiasts. Regression analysis was conducted to determine predictive ability of the significant individual and contextual correlates. None of the variables predicted computer anxiety. However, computer thoughts were predicted by years of computer use and training hours. Computer beliefs were predicted by gender and years of computer use. The results suggest the importance of computer exposure and training. In addition, a contingency approach in dealing with technophobia is proposed based on gender and the nature of computer reactions.

In today's environment, the competitiveness of a firm hinges on its ability to process information more quickly and make use of the processed information wisely. When management became a science, the resources that had to be managed were identified as the five Ms—men, machines, methods, materials, and money. In the 1970s, energy was added to the list. Information became the most important resource since the 1980s, leading to a proliferation of technology innovations that facilitate information and communication—the fax machine, cellular phones, pagers, etc. Yet, the impact of computers remains unsurpassed.

It is not surprising therefore that computerization is probably the most widely introduced change element in organizations. In an age when technology is a competitive advantage, equipping people with computer skills is now deemed necessary for organizational survival.

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But, even firms with the most advanced computer hardware and software have failed miserably in their computerization efforts. This is because the ability to harness information technology is dependent, not just on the computer expertise of its members, but also their willingness to adapt to continuous technological innovation. The culprit in most of these cases is a resistance to the use of computers. Because attitudes, thoughts and beliefs are important precursors to behavior, such resistance is a potential barrier to job performance and may eventually hinder organizational effectiveness. In fact, research shows that technophobia is related to organizational outcomes such as lost revenue, high turnover, absenteeism, and decreased productivity (Snyder & Culp, 1997).

Given the role that employee attitudes play in determining the success of technological change in any organization, this study examines the incidence and predictors of technophobia among Filipino workers.

Technophobia

What is technophobia? Jay (1981) used the term computerphobia to describe an individual's resistance to talking about or even thinking about computers, fear or anxiety about computers, or hostile or aggressive thoughts about computers. Building on his work, Rosen and Weil (1992) coined the term technophobia to mean anxiety about present or future interactions with computers or computer-related technology, negative global attitudes about computers, their operations, and or societal impact; and negative cognitions or critical self-dialogue when interacting with or contemplating future interaction with a computer or related technology. They label a technophobe as individuals whose reactions range from severe reactions on all dimensions to mild discomfort on a single dimension.

The Development of Technophobia

How does technophobia develop? Meier (1988) proposed that computer aversion can be explained by a social learning theory expectancy model. That is, previous negative experiences with technology trigger anxiety reactions and a negative internal dialogue that belittle an individual's ability and undermines his or her confidence in successfully using the technology.

Social Cognitive Theory (SCT), in contrast, recognizes the existence of a continuous reciprocal interaction between the environment in which an individual operates, his or her cognitive perceptions (self-efficacy and outcome expectations), and behavior (Compeau, Higgins, & Huff 1999). Central to SCT is self-efficacy that is viewed both as a necessary condition for computer use. In other words, individuals who do not believe they have the capability will not likely attempt to use technology. However, successful interactions with technology (e.g., enactive mastery) are also viewed as influences on self-efficacy. This also true for emotional responses (such as affect and anxiety) that are both influenced by self-efficacy and also sources of information on which self-efficacy is based.

Another theoretical framework that has been used to study adoption of new technologies is Ajzen's (1985) Theory of Planned Behavior (TPB). In this framework, intentions and behavior are a product of attitudes, norms and control. Thus, use of technology is a product of a potential user's affective evaluation of the cost and benefits of using the new technology, the amount of peer or superior influence and the perception of the ease or difficulty of using the new technology (Ajzen, 1991).

The above theories help us understand how affective and cognitive processes influence behavior. However, beyond this, one may ask, "what influences affective and cognitive processes?" Thus, another approach is to view technophobia as a product of individual and contextual factors that predispose individuals to react negatively to technology. Research has revealed a number of factors related to attitudes towards technology. These may be classified into two types: individual and contextual factors. Individual factors are those that reflect personal characteristics whereas contextual factors are those that reflect an individual's environment.

Antecedents of Technophobia

Among the individual factors, age has been a commonly cited correlate of technophobia. Specifically, studies showed that older individuals used technological devices less compared to younger workers (Weil & Rosen, 1995), and reported comply interest in new technology (Breakwell & Fife-Schaw, 1988). In the same light, a number of researches have found that older individuals report greater computer anxiety compared to younger workers (Anthony, Clarke, & Anderson, 2000; Ellis & Allaire, 1999).

Studies on gender and technology have reported inconsistent results. Some studies reported males had more favorable attitudes to computers (Teo & Lim, 1996; Weil & Rosen, 1995) whereas others found no differences between males or females (Anthony, Clarke, & Anderson, 2000; Hong & Koh, 2002).

Other studies have found a relationship between technophobia and education. Specifically, studies have found that level of education was positively correlated to the use of computers (Ellis & Allaire, 1999; Rogers, et al., 1996).

Studies have also found a relationship between technophobia and personality traits. For example, Anthony, Clarke & Anderson (2000) found technophobia was negatively correlated with openness. Studies also have showed that neuroticism is positively correlated with computer anxiety (Anthony, Clarke & Anderson, 2000; Sigurdsson, 1991).

This study builds on a cross-cultural research which looked into technophobia in 23 countries. In their cross-cultural study, Weil & Rosen (1995) found that countries such as Indonesia, Poland, India, Kenya, Saudi Arabia, Japan, Mexico and Thailand had a large percentage (over 50%) of technophobic students. In contrast, there were five countries that showed under 30 percent technophobes (USA, Yugoslavia - Croatia, Singapore, Israel and Hungary). This suggests that technophobia may also be a product of context.

For example, technophobia is related to contextual factors such as computer experience (Anthony, Clarke, & Anderson, 2000). Consistent with the social learning theory, workers who did not use computers had more negative attitudes towards computers than those who did (Marquie, Thon, & Baracat, 1994).

Not to be forgotten are the computer skills of individuals. There is robust evidence that computer knowledge is negatively associated with computer anxiety (Anderson, 1996; Ellis & Allaire, 1999). Computer training has also been found to have successfully decreased negative cognitions. For example, a quasi-experimental study found that a 5-week computerphobia reduction program consisting of individual and group treatment modules decreased computer anxiety, improved computer cognitions, and enhanced computer attitudes among students (Rosen, Sears, & Weil, 1993).

Technophobia has also been linked to technology support. In a study of teachers, Bradley and Russell (1997) reported that teachers who perceived schools to be supportive of computer technology also had less computer anxiety and more positive attitudes.

Hypotheses

This research explores the manifestations and antecedents of technophobia. Rosen and Weil (1992) suggest that there are three ways technophobia may be manifested: anxiety, negative thoughts or attitudes when dealing with computers. Because Rosen and Weil suggested that any of these three outcomes are symptoms of technophobia, these three components were treated as separate dependent variables in the research. Specifically, we hypothesized that:

1. Individual factors, specifically age, gender, educational attainment, neuroticism, openness, computer skill and experience will predict technophobia.
2. Organizational factors such as computer training and technical support will predict technophobia.

In addition, we tested whether individuals could be classified according to their reactions to computers.

METHOD

Sample

A total of 137 employees participated in this study. These employees represented five distributorship and manufacturing organizations. Participants' ages ranged from 20 to 50 years old with an average age of 30. The majority were female (60%) and had at least a college education (89%). The number of years participants' had been using a computer ranged from 1 to 17 with an average of 5 years.

Measures

The personality traits of *Neuroticism* and *Openness* were measured using Goldberg's IPIP Scale (1998). Neuroticism was measured with 20 items reflecting traits of anxiety (e.g. "I worry about things" and "I get stressed out

easily") and self-consciousness (e.g. "I am easily intimidated" and "I am afraid that I will do the wrong thing"). Openness was also measured using 20 items reflecting adventurousness (e.g. "I prefer variety to routine) and openness to complex ideas and tasks (e.g. "I like solving complex problems"). Items utilized a 5-point Likert scale of 5 (strongly agree) to 1 (strongly disagree) with higher scores indicating greater neuroticism and openness. The internal consistency reliabilities of the scales were .72 for neuroticism and .85 for openness.

To measure *computer skill*, participants were asked to indicate their level of expertise in using various computer programs using a 5-point scale of 5 (expert) to 1 (novice). Higher scores indicated greater skill.

Technical support was measured by asking respondents whether or not their company provided the following: computer training, software tutorials, computer manuals, technical assistance staff, coaching on computer use. A response of "yes" was coded as '1' and scores for these various forms were totaled to form an aggregate score of technical support with a maximum score of 5. Higher scores indicated greater technical support.

Computer experience was measured by asking participants the number of years they have been using a computer. *Computer training* was determined by asking respondents to indicate the number of days of computer training they had received.

Technophobia was measured in terms of three facets: *anxiety, thoughts* and *beliefs*. *Computer anxiety* referred to feelings on discomfort when using computers. This was measured using Rosen and Weil's (1992) Computer Anxiety Survey. Participants were instructed to indicate how anxious they feel given 20 situations involving computers such as, "learning how a computer works " or "getting an error message from the computer." Items utilized a 5-point scale with 5 (very much) and 1 (not at all). To allow for comparison with norms provided by Rosen & Weil (1992), scores were summed. However, for the correlational analysis, mean scores were computed with higher scores indicating more technophobia. Internal consistency reliability for this scale was .96.

The factor *computer thoughts* referred to cognitions of individuals when using computers. This was measured using Rosen and Weil's (1992) 20-item Computer Thoughts Survey. Respondents were asked to indicate how often they have thoughts such as "I can do this" or "I feel

stupid (reversed)" when using a computer. The scale utilized a 5-point scale with 5 (very much) and 1 (not at all). To allow comparison with Rosen and Weil's norms (1992), scores were summed with lower scores indicating greater technophobia. However, for the correlational analysis and to allow consistency in interpretations, items were reverse-scored and mean scores where computed with higher scores indicating greater technophobia. The internal consistency reliability coefficient for this scale was .72.

Computer attitudes measured the extent to which respondents felt positively about computers and whether they felt it was beneficial to them and their organization. Because Rosen and Weil's Computer Attitudes scale had low reliability scores, an original scale was created. Twelve items were developed reflecting attitudes about computers such as "Computers help me in my work" and "Computers increase my quality of life." Items utilized a 5-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree) with higher scores indicating greater technophobia. Internal consistency reliability for this scale was .94.

RESULTS

Incidence of Technophobia

Based on their normative data, Rosen and Weil (1992) suggest that for computer anxiety, scores of 20-41 indicate no technophobia, 42-49 indicate low technophobia, and 50-100 indicate moderate/high technophobia. For computer thoughts, they suggest that scores of 69-100 indicate no technophobia, scores of 61-68 indicate low technophobia and scores of 20-60 indicate moderate/high technophobia. Results show that in terms of computer anxiety, participants had no technophobia. However, scores on computer thoughts survey indicate that respondents had moderate/high technophobia. Rosen and Weil suggest that *any* subject who scores in the moderate/high technophobia group on any measure is considered to possess moderate or high technophobia. Results show that in terms of computer anxiety, 33 percent reported high technophobia. However, in terms of computer thoughts, only 3 percent had high technophobia. Comparing the incidence of technophobia among respondents to those from other countries (Weil & Rosen, 1995), we see

that the Filipino workers in this sample place 9th out of 24 countries. There were no norms to compare scores on computer beliefs because an original scale was used.

Cluster analysis was conducted to determine whether the respondents could be categorized based on their scores on the three manifestations of technophobia. This resulted in a four-factor solution (Table 1). In one cluster, respondent scores were high all on all three facets. This accounted for 13 percent of the cases. Another cluster described 30 percent of the respondents having low scores on computer anxiety but high scores on computer thoughts and beliefs. Still another cluster reflected one fourth (25%) of the sample population with high anxiety scores but low scores on computer thoughts and beliefs. The fourth cluster described respondents who had low scores on all three facets, around a third (32%) of the population.

Correlates of Technophobia

In the first stage of analysis, one-tailed correlational analysis was conducted to determine the variables significantly correlated with technophobia (Table 1). Hypotheses 1 and 3, that *age* and *education* would be positively correlated with technophobia, were not supported. Partial support was obtained for the other hypotheses in that the variables were correlated to at least one manifestation of technophobia. *Gender* was negatively correlated with technophobia but only in terms of computer beliefs. That is, men, compared to women, had more positive beliefs about the value of computers. The personality trait *neuroticism* was likewise correlated with both computer anxiety and computer thoughts. Individuals with higher neuroticism scores reported greater anxiety and less positive thoughts when using computers. On the other hand, individuals who reported greater *openness* to new things and situations reported less anxiety in using computers.

All of the contextual independent variables were correlated with computer thoughts and beliefs in the expected direction. Workers who had more *computer training, years of computer use, computer skills,* and *technical support* tended to report less negative computer thoughts and beliefs than those with less computer training, experience, skills and support.

Table 1. Cluster analysis of scores on computer anxiety, thoughts and beliefs

	Mean values			
Final cluster centers	Anxiety	Thoughts	Beliefs	No. of cases (%)
1	2.81	2.56	3.04	18 (13%)
2	1.37	2.58	2.46	42(30%)
3	3.17	2.24	1.60	34 (25%)
4	1.54	2.01	1.51	43 (32%)
F value	151.11	21.20	91.72	
Significance	.00	.00	.00	

Predictors of Technophobia

The variables that were significantly correlated with the three facets of technophobia were a regression analysis to determine the unique effects of these predictors on the various manifestations of technophobia.

The findings discussed below are presented in Table 2.

Finding 1: *Computer anxiety* was not predicted by any of the independent variables.

Finding 2: Positive *computer thoughts* when using computers was predicted by length of computer use (β=-.44,$p<.05$) and length of computer training (β=-.32,$p<.05$). The entire set of variables predicted 42 percent of the variance in computer thoughts.

Finding 3: *Computer attitudes* were determined by gender and length of computer use. Specifically, males tended to believe in the value of computers more than women (β=.22, $p<.05$). The longer individuals have used computers, the greater their belief about the value of computers (β=-.39, $p<.05$). The entire set of variables accounted for 42 percent of the variance in computer attitudes.

Table 2. Correlational analysis of study variables (N = 137)

		Mean	Std Dev	1	2	3	4	5	6	7	8	9	10	11	12
1)	Age	30.36	6.79												
2)	Gender	1.67	.47	-.33*											
3)	Education	2.00	.36	.22*	.08										
4)	Neuroticism	2.80	.34	-.32*	.01	-.10									
5)	Openness	3.61	.39	.18*	.05	-.04	-.43*								
6)	Years use	5.53	3.70	.11	.03	.04	-.17*	.21*							
7)	Training hours	277.84	930.81	-.13	.10	-.04	.21*	.10	.30*						
8)	Computer skills	1.58	.74	-.10	-.05	.00	.00	.18	.51*	.13					
9)	Technical support	2.76	1.65	.11	-.02	.03	-.07	.27*	.34*	-.09	.33*				
10)	Computer anxiety	2.06	.87	.01	-.09	-.08	.17*	-.21*	.01	.13	.04	-.09			
11)	Computer thoughts	2.31	.44	-.03	-.08	-.05	.18*	-.12	-.56*	-.39*	-.21*	-.28*	.00		
12)	Computer beliefs	2.02	.69	-.05	.20*	.01	-.05	-.07	-.56*	-.28*	-.44*	-.29*	-.05	-.44*	

Table 3. Hierarchical regression analysis for predictors of technophobia (N = 131)

	Computer Anxiety			Computer Thoughts			Computer Attitudes		
	B	SE B	ß	B	SE B	ß	B	SE B	ß
Gender							.32	.14	.22*
Openness	-.37	.21	-.16						
Neuroticism	.27	.25	.10	.21	.12	.16			-.46*
Years use				-.05	.01	-.57*	-.07*	.02	-.39*
Training hours				-.00	.00	-.20*	-.00	.00	-.17
Computer skill				.05	.05	.11	-.12	.08	-.17
Technical support				-.05	.03	-.18	-.04	.04	-.11
F	3.49*			10.86*		10.01*			
R^2	.05			.423		.417			

DISCUSSION

Results show that 1 out of 3 respondents report high anxiety toward technology in general. There is little technophobia however in terms of computer thoughts as well as in terms of computer beliefs. Furthermore, there is no correlation between anxiety and computer thoughts and beliefs yet there is a moderate correlation between thoughts and beliefs.

At initial glance, the results would be disturbing. How can one be anxious about technology and yet possess positive thoughts about computers and thence positive beliefs about computers, as the sample responses would show? In fact, the lack of relationship between anxiety (which is affect-related) and thoughts and beliefs (which are cognitive processes) is incongruent with theory and research that show a link between affect and cognition (cf Mandler, 1975).

The lack of correlation, however, could be attributed to differences in the measurement of the three manifestations of technophobia. The items of Rosen and Weil's Computer Anxiety scale refer to anxiety when dealing with a variety of computer-related equipment, including, but not limited to, a personal computer, such as a microwave oven, digital clock, automatic teller machine (ATM). On the other hand, the scales on Computer Thoughts and Beliefs ask respondents to indicate their thoughts and opinions regarding computers particularly. Presumably, respondents only thought of a personal computer when responding to the items in the latter scales. Hence, the lack of relationship is probably because of the difference in the frames of reference. It is indeed tempting to accept this explanation even as the association between technology and computers is perceived to be widely adopted.

The results of the cluster analysis also suggest that computer anxiety, whether high or low, and computer thoughts and beliefs, whether negative or positive, may indeed co-exist, as shown in the matrix proposed in Figure 1. The surveyed respondents are situated in Quadrant 3 which indicates an acceptably healthy use of computerization. Even if technology in general may be perceived as scary, the end-user's thoughts while using the computers are positive and the beliefs are positive that computers are beneficial. This results in an initially cautious and reluctant application of computers in the workplace (labeled the 'Reluctant User').

Figure 1. Matrix of reactions to technology

	High anxiety	Low anxiety
Negative thoughts and/or beliefs	Quadrant 1 *1)Technology is scary and should not be used at all* ULTIMATE TECHNOPHOBE	Quadrant 2 *2)Technology is okay but should be used with caution* COMPUTER SKEPTIC
Positive thoughts and/or beliefs	Quadrant 3 *3)Technology is scary but is useful* RELUCTANT USER	Quadrant 4 *4)Technology is okay and should be used fully* COMPUTER ENTHUSIAST

With continued usage though, the reluctance is overcome and there is maximal utilization of computers at the work-place, as would be the case in Quadrant 4. We label those who fall in this quadrant as the 'Computer Enthusiast'.

This is in stark contrast to a situation in Quadrant 1 where anxiety is high and thoughts and/or beliefs are negative. We label a person in this situation as the 'Ultimate Technophobe'. In certain cases, as in the hypothetical Quadrant 2, there is low anxiety but thoughts and/or beliefs are negative. In such a scenario, technology is perceived as okay but should be used with caution. We label individuals who fall in this quadrant as the 'Computer Skeptic'.

In addition, we suggest that it is possible that the acceptance of technology and resultant computer use does progress, as a process, from Quadrant 1 chronologically moving onward to Quadrant 4. Although the progression from Quadrant 1 onward could be a subject for further research, there is enough theoretical basis to surmise that fear of computers is a process. Rosen and Weil's work on computer anxiety and computer thoughts is a breakthrough in this thinking, where anxiety is the affective component that may lead on to thoughts as the cognitive component of such phobia. This implies that the phenomenon

of technophobia may be addressed not just at the individual level (individual's anxiety) but also on the perceived benefits of computerization at the firm or organizational level.

Still, the question remains – what are the antecedents of computer anxiety, thoughts, and beliefs? The regression analysis performed on the three measures sought to determine which variables these are correlated with. Two types of variables were examined, namely, individual factors and context factors. The individual factors of age, gender and educational attainment as well as the personality factors of neuroticism and openness were pre-identified as factors, latent to the end-user individual that may predispose him or her to be technophobic. Similarly, some contextual factors were examined, particularly computer usage, computer training, computer skills and the availability of technical support systems within the organization. Individual and contextual factors were identified to determine the factors change agents can manage for the maximal and proper use of computers in the workplace.

The results revealed interesting differences in predictors of the various manifestations of technophobia. Computer anxiety was not predicted by any variable. Computer thoughts were predicted by length of computer use (ß=-.57) and computer training (ß=-.20). Computer beliefs, on the other hand, were predicted by gender (ß=.22) and length of computer use (ß=-.46). This supports the earlier findings of Anthony, Clarke, and Anderson, (2000) and Marquie, Thon, and Baracat (1994).

The regression analysis showed that only two of the three manifestations of technophobia were found to be predictable given the variables employed in this study. A significant amount (42%) of one of the cognitive aspect of technophobia – computer thoughts – was predicted by computer experience and amount of computer training. Forty two percent (42%) of the variance in computer beliefs – also a cognitive component of technophobia – was likewise predicted by computer experience.

Although some of the study's hypotheses were confirmed, others were not supported. The lack of correlation between age and technophobia contrast with studies which indicated that older individuals reported greater anxiety in computer use, (Anthony, Clarke, & Anderson, 2000), used technological devices least compared to younger workers (Rosen & Weil, 1995), and reported less interest in new technology (Breakwell

& Fife-Schaw, 1988). On one hand, the lack of relationship is perhaps a good sign that the adage "it is hard to teach old dogs new tricks" may not necessarily be true for older people and technology. On the other hand, the sample may not be representative of workers in organizations. The ages of participants ranged from 20 to 50 years, a great majority of were in their 30s.

Similarly, no support was found for the hypothesis that educational attainment is negatively correlated to technophobia. This is inconsistent with previous research that level of education was positively correlated to the use of computers (Ellis & Allaire, 1999; Rogers et al., 1996). One explanation for this finding is the sample's lack of variance in educational attainment. Eighty nine percent (89%) of respondents were college graduates. This reflects current trends in Philippine organizations to require at least a college degree in hiring employees, regardless of job position.

Other variables such as neuroticism, openness, computer skills, and technical support were correlates but not predictors of technophobia. Specifically, the personality variable had significant, albeit, low correlations with computer anxiety. This means that the relationship is too weak to predict the incidence of anxiety. Computer skills and technical support were correlated but not predictive of computer thoughts and beliefs. This is understandable since computer skill is an outcome of computer use and training. Thus, taken together, the outcome variable's contribution is diminished.

Partial support was found for the relationship of gender and technophobia. Gender was negatively correlated to technophobia but only in terms of computer beliefs. This is consistent with previous research showing that males have more favorable attitudes to computers (Teo & Lim, 1996). Such a gender gap may perhaps be attributed to computers being traditionally linked with science, mathematics and engineering—areas which are male-dominated.

Given all these findings, how can organizations address the phenomenon of technophobia? Positive attitude change may be achieved through formal instruction on the benefits of computer applications on productivity, efficiency, speed and effectiveness. Computer thoughts are influenced by length of computer usage.

Constant exposure to computers, which allow end-users to discover the applications on their own, remains an effective intervention. Experiencing first hand the benefits of computers through continued usage would further convince end-user that computers do make life at work easier.

However, exposure alone may not be enough. This is true especially if the computer applications are complex and not user-friendly. In these cases, mere exposure without the requisite skills may only create feelings of frustration that may lead to technophobia. The results showed that computer thoughts are predicted by length of formalized computer training. Computer training and computer use are factors which must support each other in intervention efforts. Coaching end-users as they use the computers may be useful in minimizing negative thoughts.

A Contingent Approach to Technophobia?

The results also emphasize the impact of gender on computer beliefs and particularly, on computerization efforts. Females have less positive attitudes on the use of computers than males. This suggests that a different approach may be required for female users as they are less likely to be convinced of the benefits of computer applications. Although it is tempting to latch on to the stereotypes of males as computer savvy and females as not, the study simply tells us that female users need to be sold on the benefits of technology at work. Change practitioners must emphasize end-results of computerization – the big picture, rather than the process per se. This could begin with the benefits of computer usage on socialization and then moving on to the benefits of usage at work. Identifying computer savvy female role models could facilitate this process.

The results also suggest that a contingent approach may be required depending on how technophobia is manifested. In our framework in Figure 1, we suggested four general types of reactions to computers. Change practitioners may need different approaches depending on whether the problem is cognition (thoughts and beliefs) or affect (anxiety), or both. For example, for ultimate technophobes (Quadrant 1), the approach may require a more clinical approach – treating technophobia with the interventions used to treat phobias such a systematic desensitization, cognitive-behavior therapy, etc. There may be a need, in

fact, to examine interventions in the realm of clinical psychology, such as the management of emotions, and develop programs applying these methods at the organizational level. For computer skeptics (Quadrant 2), the approach can be more cognitive – selling the benefits of and clarifying misconceptions about technology. For reluctant users (Quadrant 3) who know the benefits of technology but are just scared of it, training and coaching might be the best approach.

Limitations and Implications for Research

Beyond the results of this study, there are more questions for further research. For example, although this study examined the various individual and contextual predictors of technophobia, the correlational design does not allow a causal relationship between the variables.

In addition, the independence of the constructs computer anxiety, thoughts, and beliefs needs validation using instruments with the same frame of reference. All of the instruments only referred to computers or to technology in general, but not both. In addition, the categorization of computer users as presented in the matrix needs to be validated. Further testing of this framework needs to be done to see how robust our results are.

Ironically, although most technophobia occurred in the form of anxiety, none of the variables predicted its occurrence. These results suggest that in a computerization effort, practitioners are able to influence the thought process more than the emotional or feeling process of the end-users. This implies that there may be other contextual or even individual variables affecting computer anxiety that were not considered.

The convenience sample may also have affected the impact of the variables age and education. A larger and more stratified sample may provide greater variance on these variables.

Finally, the issue of technophobia needs to be explored in relation to actual computer use. For example, which of the technophobia manifestations (anxiety, thoughts and beliefs) has a stronger relationship with actual behavior?

SUMMARY

This research identified predictors of technophobia. Technophobia was conceptually broken down into three components, computer anxiety at the affective level, as well as computer thoughts and computer beliefs, both at the cognitive level. A matrix was developed describing the various reactions to computers. It was proposed that individuals could be classified into technophobes, computer skeptics, reluctant users and computer enthusiasts. A number of individual and contextual factors predicted the various manifestations of technophobia. The only individual factor that was shown to affect technophobia was gender and this only affected computer beliefs. Other contextual factors of computer usage and the amount of computer training predicted computer thoughts and computer beliefs. Computer anxiety was found to be high and but was not predicted by any of the individual or contextual variables. The implication for practitioners garnered from the findings on the contextual variables is to constantly expose end-users to computers. However, exposure needs to be supplemented by formal training or coaching. In addition, a contingency approach to dealing with technophobia is proposed based on gender and the manifestations of technophobia.

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