

TECHNOSTRESS AMONG EDUCATORS: A REVISIT OF SOCIAL COGNITIVE PERSPECTIVE

Khairunnisa Harahap and Tri Effiyanti
State University of Medan, Medan, Indonesia
Corresponding author: trieffiyanti@yahoo.com

Abstract

The rapid development of computer technology should facilitate individuals to accomplish their specific tasks in more effective and efficient ways. Yet, some teachers have still experienced a barrier towards the use of computer technology in their worklife. This cognitive thought further exhibits technostress resulted from their negative belief and resistance in adopting the computer technology. The purpose of our research is to evaluate the perspective given in social cognitive theory embedded in the relationship among individual perceptions on technology acceptance, work overload, job insecurity and technostress indicated from individuals physical and psychological responses. The survey was conducted using a sample of 152 vocational schools teachers at a selected region in Indonesia. The results of data analyses using partial least square (PLS) method suggested that technostress could be overcome by enhancing teachers' belief through the employment of ICT in their educational service. The high level of individual cognitive belief towards computer technology will reduce the level of technostress without being afraid of having greater amount of workload and job insecurity caused by their lack of computer efficacy.

Keywords: Technostress; Perceived usefulness; Perceived ease of use; Work overload; Job insecurity; Social cognitive theory

1. Introduction

The use of information, communication and technology (ICT) has played important part in the various professional activities. More specifically, many scholars have emphasized the use of ICT as an integral part within the contemporary educational structures emphasizing the contribution towards the usage of ICT both in the pedagogical and instructional developments and process (Longman, 2013; Sam et al., 2005; Marina, 2001). Surprisingly, Black (2010) indicated the fact that teachers utilize the limited use of ICT for facilitating their teaching delivery only is still unexceptional. With the demand on the maximizing the use of ICT into teachers' daily works grows, it further creates another problem for those who still struggle to accept the ICT leading to the psychological stress resulted from the fear or resistance to adopt ICT. Brod (1984) identified this psychological stress as technostress that can manifest itself physically into number of symptoms like strain, anxiety, and negative affectivity towards the use of computer technology.

Prior research have pointed out workloads and job insecurity as the major creators of this individual response on the use of ICT (Rolon, 2014; Longman, 2013; Ayyagari, 2011; Tarafdar et al., 2011; Ragu-nathan et.al, 2008; Ennis, 2005). According to these authors, lack of efforts in exploring and developing the ICT knowledge and skills by the ICT users may provide them with extra amount of workloads that subsequently affects more anxiety and strain in the way they integrate the ICT into their worklife. In addition, the existing professionals who still struggle to

deal with the rapid changes in ICT may feel threatened by the others who have better knowledge and skills in applying ICT leading to create more frustration and stress.

More specifically, Rolon (2014), Longman (2013) and Granger et al. (2002) indicated that teachers still face the classic challenge in integrating technology beyond various classroom activities. The increasing use of ICT in the society also creates another pressure for the teachers in fulfilling their academic related-tasks given by superintendents, curriculum specialists, and administrators, to adopt ICT at a high level of academic purposes. The aim of this research is to investigate the relationship among technology acceptance model, work overloads, job insecurity and technostress in high school teachers in Indonesia. It is based on the perspective given by the social cognitive theory developed by Bandura (2001) highlighting the interactions of behaviors, personal, and environmental factors allowing individuals to create and receive changes. In particular, this basic premise is also reflected in the Technostress model by Brod (1984) emphasizing the stress in work-place caused by the inability to deal with ICT's that could have negative consequences both in personal and organizational performances.

Majority research in the area of technostress have focused in analyzing the consequences of technostress (Laspinas, 2015; Ayyagari, 2011). To the best of our knowledge, limited efforts have been taken in determining the antecedents of technostress that further link them within the relationship between an individual's perceiveness on computer technology (Ayyagari et al., 2011; Shu et al., 2011). A more thorough analysis on psychological and physical symptoms of technostress also provides a fresh insight into research in this area. The remainder of this paper discusses about the theoretical framework and hypotheses development of the research. The next section further describes the research method and design followed by the interpretation of data analysis. The final section concludes the discussion and implications of the research.

2. Theoretical Background and Hypotheses Development

2.1. Technostress and Social Cognitive Theory (SCT)

Generally, stress occurs when there is a gap between people expectation's and their existing environment. A Person-Environment (P-E) Fit model of stress by Edwards and Cooper (1988) emphasizes that the gap resulted from how individual perceives the situation could create stress. Accordingly, Ayyagari et al. (2011) and Fox et al. (1993) further classified the outcomes of stress into psychological and physical conditions. The authors emphasize that the reflection of psychological state of stress is represented on how the cognitive perspective from an individual interpret or embrace the environmental needs, e.g. frustration and resistance to learning. In addition, the physical responses from the failure to meet individual needs or job demands visualize the outcome of stress, from the anxiety to the coronary heart-disease.

The rapid development in ICT has created stress to some of its users. This kind of stress that is related to the inability of an individual to cope with the computer technology is widely acknowledged as technostress that is originally discussed in Brod (1984). A further work by Tarafdar et al. (2007) developed five dimensions that create technostress: techno-overload, techno-invasion, techno-complexity, techno-insecurity and techno-uncertainty derived from an individual perception in adopting the ICT in his/her work activities. More specifically, both models of technostress developed by Brod (1984) and Tarafdar et al. (2007) are further modified by Ayyagari et al. (2011) for the purpose to develop the antecedents of computer related-stress using the P-E fit model of stress. In sum, the authors indicated that individual's preferences and subjective evaluation of the computer technology eventually construes his/her negative reactions on the use of ICT.

The investigation on the influence of individual's preferences towards technostress was also found in a study by Shu et al. (2011). The authors developed a conceptual model that linked an individual's perceiveness on the computer technology with the technostress. Referring to the SCT perspective aligned by Bandura (1984) and Jones (1989), the authors argued that the individuals behaviours' towards the use and existence of ICT is not created from the situation that force them to adopt ICT. Bandura (1986, p.xi, 2001) defines SCT as a "theoretical framework for analyzing human motivation, thought, and action" that "embraces an interact model of causation in which behaviour, cognition and other personal factors, and environmental influences all operate as interacting determinants that influence each othr bidirectionally". As the consequence, Shu et al. (2011) concluded that further individual responses with regards to the adoption of ICT is a result from his/her subjective interpretation.

Two key factors were discussed within the study conducted by Shu et al. (2011): technology dependency and computer self-efficacy. The results of the study further confirmed the perspective given in SCT suggesting that an individual with stronger confidence and higher computer self-efficacy tend to have a low level of technology related-stress. The implication of this study also remarked SCT to the extent that an individual with higher level of confidence on the ICT can overcome the sense of job insecurity. In addition, the authors indicated that problems and troubles over the use of ICT lead to more technology overload on the individual.

The present study is motivated from the work conducted by Ayyagari et al. (2011) focusing to determine the antecedents of symptoms of technostress from the lens of social cognitive perspective. This study further modified the conceptual model of Shu et al. (2011) in analyzing the relationship between technology acceptance by an individual and technotress. The constructs of technology acceptance regarded the model developed by Davis (1989) categorizing two important factors: the perceived usefulness and the perceived usability that influence the individual behaviours in adopting ICT. Thus, when an individual cognitively thought that ICT is difficult to use and they have less control over the use of ICT at work lead to the creation of work overload and sense of job insecurity that eventually prone to experience technostress (Rolon, 2014; Ayyagari et al., 2011).

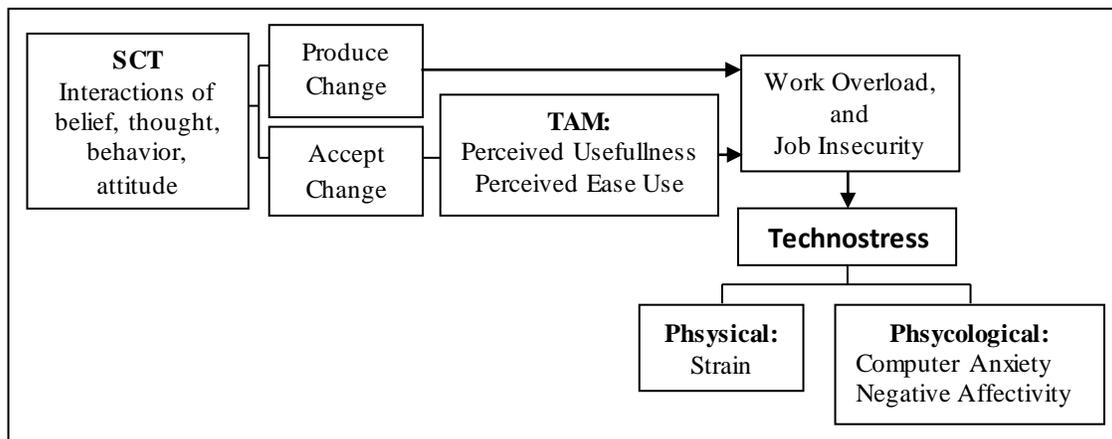


Figure 1. Conceptual Framework of the Study

2.2. Hypotheses Development in the Relationship among TAM, Workload, Job Insecurity and Technostress

Davis (1989) pointed out that the behavioural intention affects the individual decision in using ICT. In the eye of TAM, Davis (1989) posits that the behavioral intention is reflected both in the individual's attitude towards the use of ICT and his/his perception of utility of ICT. More specifically, Davis (1989) define perceived usefulness as the extent to which an individual believes that the use of a system will benefit to his/her performance whereby the perceived ease of use portrays individual perceptions on the extent of ICT applicability. According to Sami and Pangannaiah (2006), Igbaria et al. (2007) and Davis (1989); the attitude of an individual towards using ICT complements his/her belief on the significancy on the value of ICT.

TAM is designed to reduce an individual's reluctant to the rapid changes of ICT allowing the users to adopt the ICT faster. However, Ayyagari et al. (2011) and Sami and Pangannaiah (2006) posited that the use of ICT nowadays is inevitable. Even though individuals might have a negative view on the usability of ICT features, they have to use the ICT in their work environment involuntarily. Thus, this individual subjectivity towards the existence of ICT possibly provokes the perceptions to work harder leading to an increase amount of works (Aborg and Billing, 2003 in Ayyagari et al., 2011). Educators feel work overload due to their inability to finish their job as expected due to low convergency between their job demands and computer self-efficacy. As the result, the greater amount of works, the higher possibility of individuals experiencing ICT-related stress.

H1a: Individual perceived usefulness of ICT will be negatively related to perceived work overload.

H1b: Individual perceived ease of ICT usability will be negatively related to perceived work overload.

H2 : Individual perceived work overload will be positively related to technostress.

The emerge and/or updated technologies also lead to higher level of job insecurity. Ayyagari et al. (2011) underlined that the introduction and continuous changes of technologies influence individuals low perceptions on the use of ICT as they have to spend more time in finishing their works using the ICTs. In addition, Sami and Pangannaiah (2006), Vietez et al. (2001), and Korunka et al. (1996) also indicated that the increased job demands resulted from the technological changes further forces individuals to learn new or higher skills.

Ayyagari et al. (2011) infered that the pace of ICT development may leave individuals with the outdated ICT skills. With the low level of cognitive resources, individuals will further feel cease on the recent ICT changes. Accordingly, the sense of job insecurity will increase due to individual's cognitive resistance on the use and benefit in adopting recent technologies towards the completion of their job demands. The fear of losing job leads to the creation of anxiety and frustration among individuals. Hence,

H3a : Individual perceived usefulness of ICT will be negatively related to perceived job insecurity.

H3b: Individual perceived ease of ICT usability will be positively related to perceived job insecurity.

H4 : Individual perceived job insecurity will be positively related to technostress.

In addition, the convergence of SCT within the present study in determining the antecedents of the individual responses towards the ICT-related stress implicates the mediating effect of workload and job insecurity in the relationship between two important factors of TAM as earlier mentioned and the technostress. Therefore, an additional analysis is accounted into the research model and we hypothesize:

- H5a: Individual perceived work overload will mediate the relationship among individual perceived usefulness of ICT, individual perceived ease of ICT and technostress.*
H5b: Individual perceived job insecurity will mediate the relationship among individual perceived usefulness of ICT, individual perceived ease of ICT and technostress.

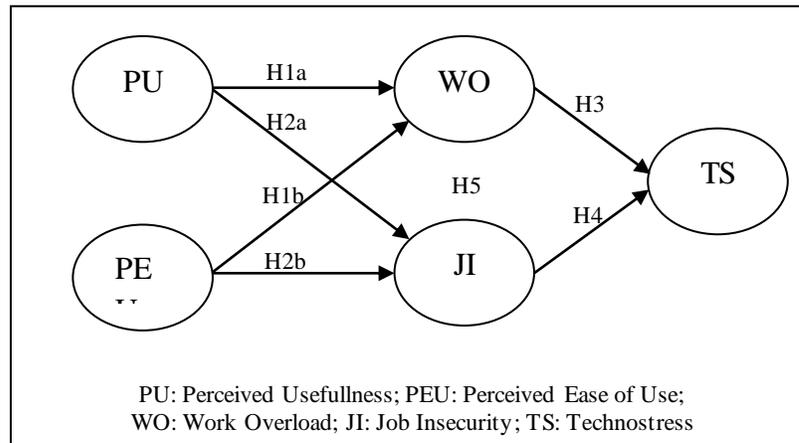


Figure 2. Research Model

3. Research Design and Methodology

3.1. Data Collection

The respondents of this study are vocational schools teachers' at the district of Karang Anyar in Central Java, Indonesia. The survey was conducted within June 2013 and distributed to a random sample of 207 teachers among the respective region. A total number of 152 questionnaires were further used in the analyses, with a response rate of 73.43%. A more detailed information of respondent characteristics is given in Table 1 below.

Table. 1 Sample Demographics

	Number	Percentage
Gender		
Female	85	56%
Male	67	44%
Total	152	
Age		
20-35	55	36%

36-50	82	54%
51-60	15	10%
Total	152	

Education

Undergraduate	9	6%
Graduate	143	94%
Total	152	

3.2.Measures

This study adopts the similar instruments developed for the constructs of interest in prior studies with a very slight adjustment. All of the items were quantified into 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

1. Technostress was measured by three indicators: Computer Anxiety, Strain, and Negative Affectivity. Each of computer anxiety, negative affectivity and strain consisted of 9 items that were respectively developed by Heinszen et al. (1987), Moore (2000) and Agho et al. (1992).
2. Work overload and job insecurity was individually assessed using 3 items that were originally developed by Moore (2000) and Ashford et al. (1989).
3. TAM was measured by the total of 6 items for each individual perceived usefulness and perceived ease of use based on the model developed by Davis (1989).

4. Data Analysis

We used partial least squares (PLS) as a structural equation modelling (SEM) in examining measurement and structural models for this study (Thatcher and Perrewe, 2002; Bollen, 1989). The use of PLS for the measurement model is to examine the hypothesized links between indicators and latent constructs, whereas the hypothesized paths between exogenous (independent) and endogenous (dependent) are estimated by the structural model. More importantly, to overcome the issue on the statistical power over the use of PLS, Goodhue et al. (2006) noted that PLS path modelling is still considered convenient and powerful for complex research models with sample sizes that would be too small for covariance based-SEM techniques.

4.1.Measurement model

In examining the measurement model through assessing reliability and validity using PLS, Chin (1998) and Barclay (1995) in Thatcher and Perrewe (2002) suggested to calculate a block of indicators' composite reliabilities, average variance extracted (AVE). In addition, Fornell and Larcker (1981) recommended a composite reliability of the construct greater than .70 as a threshold for further examination. The authors also urged that the value of AVE should be greater than .50 to measure the variance captured by the indicators relative to measurement error in further justifying the constructs in the analysis. Table 1 indicate adequate composite reliabilites and AVEs for the observed constructs.

Table 2. AVE, Composite Reliability and Correlation of Constructs

Construct	AVE	Composite Reliability	Correlation of Constructs and Average Variance Extracted (AVE)					
			(1)	(2)	(3)	(4)	(5)	
(1) Perceived Usefulness	0,604	0,901	0.777					
(2) Perceived Ease of Use	0,569	0,886	0.736	0.755				
(3) Job Insecurity	0,576	0,914	-0.527	-0.281	0.883			
(4) Work Overload	0,779	0,800	-	-	0.384	0.759		
(5) Technostress	0,513	0,931	-	-	0.779	0.510	0.716	

The second procedure in determining the measurement model is to evaluate discriminant and convergent validity. A discriminant validity is confirmed in Table 2 since the square root on each AVE's constructs is greater than the correlation of constructs occurred to other variables. Another way to examine the the discriminant validity can be conducted through an examination of factor loadings in the individual indicator. Chin (1998) in Thatcher and Perrew (2002) stated that the loaded value of an indicator in one variable should be greater than the loaded value in any other variable. In addition, Hair et al. (2010) suggest the value exceeding .50 as the critical value in determining items in each construct. Table 3 presents the clean factor loadings on items for the constructs of interest. The results from overall evaluation of measurement models for this study further concluded modest discriminant and convergent validity (see Table 2 and Table 3).

Table 3. Factor Loadings for The Measurement Model

Construct	Items	Factor Loadings
PU1	Using ICTs in my job would enable me to accomplish tasks	0.659
PU2	more quickly.	0.800
PU3	Using ICTs would improve my job performance.	0.843
PU4	Using ICTs in my job would increase my productivity.	0.798
PU5	Using ICTs would enhance my effectiveness on the job.	0.812
PU6	Using ICTs would make it easier to do my job.	0.736
PEU1	I would find ICTs useful in my job.	0.814
PEU2	Learning to operate ICTs would be easy for me.	0.681
PEU3	I would find it easy to get ICTs to do what I want it to do.	0.568
PEU4	My interaction with ICTs would be clear and	0.776
PEU5	understandable.	0.825
PEU6	I would find ICTs to be flexible to interact with.	0.827
WO1	It would be easy for me to become skillful in using ICTs.	0.894
	I would find ICTs easy to use.	

WO2	ICTs create many more requests, problems, or complaints	0.849
WO3	in my job than I would otherwise experience.	0.904
JI1	I feel busy or rushed due to the use of ICTs.	0.613
	I feel pressured due to the use of ICTs.	
JI2	ICTs will advance to an extent where my present job can be	0.847
JI3	performed by a less skilled individual.	0.798
	I am worried that new ICTs may pose a threat to my job.	
CA1	I believe that ICTs make it easier for other people to	0.730
CA2	perform my work activities.	0.826
CA3	I dislike working with machines that are smarter than I am.	0.648
CA4	I feel apprehensive about using ICTs.	0.741
	I have difficulty in understanding the technical aspects of	
CA5	ICTs.	0.743
CA8	It scares me to think that I could destroy a large amount of	0.778
	data by pressing the wrong key/button in my ICT related-	
TS1	devices.	0.659
TS3	I hesitate to use the ICTs for that I would make mistakes	0.760
TS4	which are unfixable.	0.623
TS5	I have avoided ICTs because they are unfamiliar and	0.722
TS6	somewhat intimidating to me.	0.677
TS7	I feel drained from activities that require me to use ICTs.	0.767
TS8	My body will get strain due to working all day with ICTs.	0.601
	I feel burned out from my ICT activities.	
	I often find myself worrying in operationalising ICTs.	
	I feel desperate when my ICT's device is not working.	
	I suffer from nervousness in operationalising ICTs.	
	My mood often goes up and down in operationalising ICTs.	

4.2. Structural Model

The results of the structural model is displayed in Figure 3. We conducted a bootstrapping procedure to generate t-statistics and standard errors (Chin, 1998 in Thatcher and Perrewe, 2002).

Each of perceived usefulness and perceived ease of use demonstrated a direct, statistically significant, negative relationship with work overload WO (H1a and H1b, $p < .01$). The result indicates that individuals who perceived the benefit and usability of ICT, representing a higher technology acceptance, may perceive lower workload, thus supporting H1a and H1b.

H2, which specifies that work overload has a direct and positive impact on technostress, is also supported. The path coefficient is .696 which is statistically significant at $p < .01$. The result indicates that individuals with high work overload were more likely to experience technostress than those having a lower workload.

Accordingly, the influence of TAM, that is reflected in each individual perceived usefulness and perceived ease of use, revealed a different result. The path coefficient for H3a shows a direct, statistically significant, negative relationship between individual perceived usefulness and job insecurity ($p < .01$) indicating individuals having higher expectation in using ICT tend to have a lower sense of losing their job. Likewise, the result of H3b testing is not supported ($p > .50$) suggesting that individuals who experienced a lag in using the ICT features were less likely to

have a higher job insecurity than were their peers. Thus, TAM is partially influenced the job insecurity.

The result on H4 testing demonstrated a direct and positive relationship between job insecurity and technostress, thus H4 is supported ($p < .01$). It suggests that individuals who were fearful of losing their jobs were more likely to experience technostress. Lastly, we tested for the mediating effect of work overload (H5a) and job insecurity (H5b) in the relationship between TAM and technostress separately. We followed a three steps-testing developed by Baron and Kenny (1986) in examining H5a and H5b individually. H5a is supported due to a full mediation support of work overload found within the model, however job insecurity is partially supported the influence of TAM on technostress among teachers. Hence, H5b has partially supported.

Specifically for H5b, the first procedure was conducted by separately testing the direct effect of PU, PEU and JI on TS. All of these independent variables significantly correlated with technostress ($p < .01$). Subsequently, we simultaneously tested paths from PU, PEU and JI on TS. Interestingly, PEU remained as the only predictor which was not significantly correlated with TS ($p > .05$). We continued to add the paths from PU and PEU to JI. PEU did not show a significant relationship with JI ($p > .05$). While there was no direct effect of individual perceived ease of use of ICT found onto JI, support was found for direct effect of JI on TS ($p > .01$).

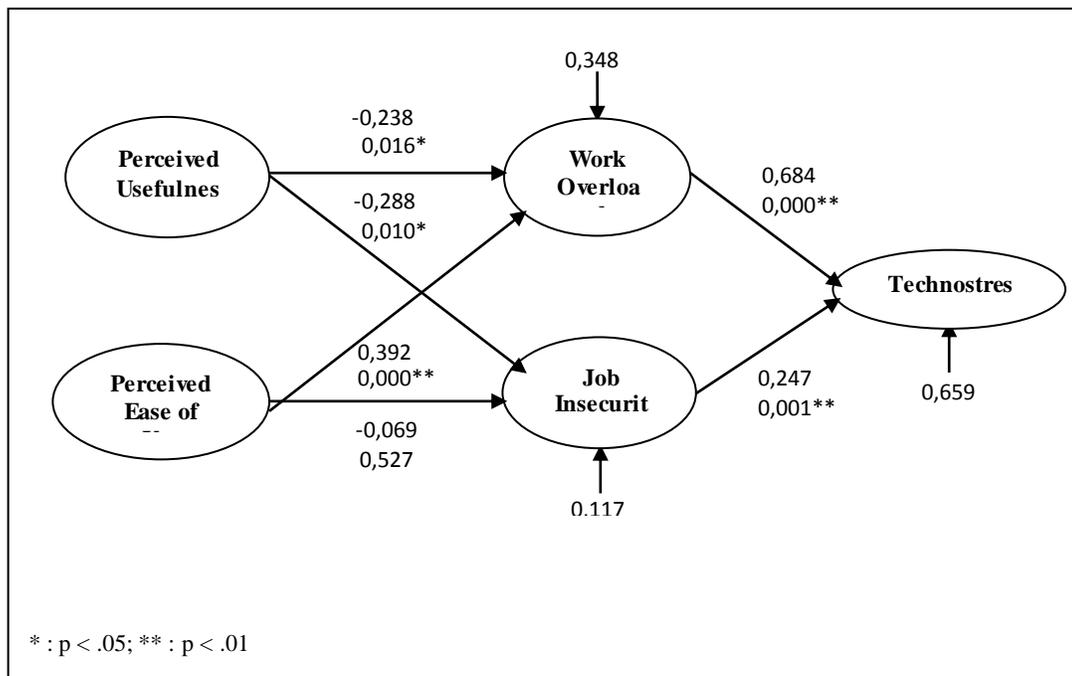


Figure 3. PLS Structural Model

5. Conclusion

5.1. Summary of Findings

The aim of the study was to examine the relationship among individuals perceived usage, perceived ease of use, work overload, job insecurity and technostress of teachers in Indonesia. More specifically, the research also tested the mediating effect of work overload and job insecurity in the relationship among perceived usage and perceived ease of use with technostress. According to Bandura's SCT model, the individual's level of perceivedness over the usage and usability of ICT features influence the extent of technostress. Perceived usage and perceived ease of use are two important factors reflecting the individuals' TAM toward the adoption of ICT. (Davis, 1989). As the consequence, Rolon (2014), Ayyagari et al. (2011), and Shu et al. (2011) indicated that when an individual cognitively thought that ICT is difficult to use and they have less control over the use of ICT at work lead to the creation of work overload and sense of job insecurity. These authors further suggested that an increase amount of workload and greater feeling of losing job lead individuals experiencing symptoms of technostress. Except for H3b, all hypotheses drawn from the review of theoretical and empirical literature were supported.

The results of our study supported the findings in Ayyagari et al. (2011) and Igbaria (1992) emphasizing the importance of individual's consideration in the acceptance of ICT. Our findings also complemented the implication of the study conducted by Shu et al. (2011) highlighting the higher self-confidence of individual in using ICT to perform a specific task, the lower the possibility of individuals having greater amount of work, as well as the lower the sense of job insecurity. More specifically, to the extent of ICT contribution into the educators context, the finding of this study was also consistent with the implications provided in Longman (2013) and Black (2010). As some teachers have perceived that the use of ICT has provided a burden into their lives leading to the increase of their workload. Consequently, this heavy workload forces teachers adopting ICT beyond to facilitate the delivery method in the class. In addition, Vladut and Kallay (2010) underlined that the increase of teachers' workload creates technostress among teachers. The authors also stated that the frustration displayed on teacher's negative attitude towards the use of ICT in the classrooms shows one of major symptom of technostress as prescribed by Brod (1984).

Interestingly, the result on the relationship among observed variables with individual perception of job insecurity show a mixed result. The analysis on the influence of TAM to job insecurity provide a new insight to the SCT. The results confirmed the suggestion made by Ayyagari et al. (2011) and Shu et al. (2011) highlighting the individual's limited skills and resistance on ICT expands the sense of fear of losing job. However, individual perception of job insecurity was partially influenced by TAM constructs. The findings indicated that perceived usefulness influenced individual perception of job insecurity significantly whereby perceived ease of use found no significant relationship statistically with job insecurity. It can be argued that, based on postulates given by Dillon and Morris (1996) and David (1989), the probability of individuals further use ICT depends on the situation in which they perceive that the system will improve their performance at work. More specifically, teachers tend to be less afraid on losing their job although they have a very limited resources in adopting ICT in their daily activities.

The findings on the full mediating effect of work overload and partially mediating effect of job insecurity within the relationship between TAM and technostress have not also emphasized the aforementioned postulate but further indicating the importance of work overload within the research model involving SCT. Even though teachers perceived negatively towards usefulness

and ease of use of ICT, they tend to have a minimum stress related to technology as the incapability of teachers on using ICT will not create any extra work and further experience less sense of job insecurity.

5.2. Practical Implications and Future Research Directions

The existence of ICT has given impact into our society and educational aspects. The main role of ICT itself is actually to assist individuals for completing their specific tasks in more effective and efficient ways. However, some teachers in particular, have had different cognitive thought towards the use of ICT in their worklives that further exhibiting technostress resulted from their negative belief and resistance to adopt the ICT.

From the managerial perspective, our findings highlighted one important point on the issue in increasing teachers belief towards adopting ICT in the employment of their education service. In a more detail, Longman (2013) suggested to provide more support, training, and guidance from the educational leaders as important methods in overcoming technostress among the teachers in classrooms. More importantly, providing relevant technical supports and continuous professional development in mastering ICT will increase teachers' technology acceptance. Consequently, it will reduce the level of technostress without having the sense of heavy workload and job insecurity resulted from teachers' inability to deal with ICT.

Despite the fruitful insight developed from the analysis on relationship among the model of TAM from SCT perspective's with technostress, this research has few limitations. Firstly, due to the restricted amount of sample size from teachers in one of districts in Indonesia, the results might have limited generalizability to the individuals outside the non academic environments as well as from their peers in various school levels. Another limitation is the research method to generate a stronger internal validity gained from the employment of different research techniques i.e. combining quantitative and qualitative methods or conducting a more depth analysis through a triangulation method.

Even though this study analyzed symptoms of technostress from the physical and psychological point of views, we do not determine the superiority of certain symptom that is influenced by the latent variables. As our major intention is to clarify the influence of TAM, workload and job insecurity under a specific technostress response's. Accordingly, subsequent research may look into this area by involving other important stressors (e.g. demographic variables and industry differences) affecting certain stress symptoms and/or characteristics of techno related-stress as prescribed by Brod (1984).

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