科技部補助專題研究計畫成果報告
期末報告

你累了嗎？職場科技超載對員工心理健康的影響：人力資源管理的角色

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中 文 摘 要 ： 科技主導了二十一世紀的社會發展、經濟活動、商業行為與人際溝通。網路科技的無遠弗屆使得員工或主動或被迫隨時隨地使用網路科技來處理、聯繫工作相關事宜，工作與個人時間的區分逐漸模糊。員工無時無刻都可以上工，原本是企業與員工生產力提升的一大利器，但也可能影響員工的工作生活平衡及心理健康，使員工表現彈性疲乏。本研究探討職場科技應用與員工心理狀態的關係，以及人力資源管理措施是否可以調節並改善職場科技超載與員工心理健康的關係。研究以焦點團體訪談的質性方法發展出測量調節變數「人力資源管理角色」的題項。之後以台灣的知識工作者為樣本，發放問卷收集量化資料，以驗證研究假設。本研究通過在線和紙本問卷收集了台灣448名知識工作者的便利樣本。正如預期，工作與生活的平衡被發現可以積極地預測本研究中的心理健康狀況。此外，還發現了三項人力資源政策，可以改善職場科技超載與工作與生活平衡之間的關係。然而，由於職場科技超載導致工作與生活平衡受到影響的主要假設沒有得到證實。不過，這項研究確實發現職場科技超載和加班時數之間存在強烈的正相關關係，而且加班時數顯著地且負向地預測了工作與生活的平衡。因此，可推測職場科技超載似乎不直接對工作與生活平衡產生負面影響，而是通過增加加班時間。建議未來的研究應探究這個替代解釋。

中 文 關 鍵 詞 ： 職場科技超載、加班、工作生活平衡、員工心理健康、人力資源政策

英 文 摘 要 ： Technology has produced a profound impact on human beings in modern society. In Taiwan, popular social networking tools such as Facebook and Line are being used to connect work group members, making the distinction between work and life difficult. When work spills over to personal life, negative effect such as work-life imbalance and lower psychological well-being may occur in the workplace. This study seeks to study the general phenomenon of technology overload in the workplace in Taiwan by investigating its effect on employees' work-life balance perception and psychological well-being. Also, to address the gap in literature in identifying potential solutions of workplace technology overload, this study proposes to examine Human Resources Departments' responses to technology overload as a moderator to the main relationship of technology overload and psychological well-being. This study collected from a convenience sample of 448 knowledge workers in Taiwan through on-line and paper-based questionnaires. As expected, work-life balance is found to positively predict psychological well-being in this study. Also, three HR policies were found to strengthen the relationship between technology overload and work-life balance. However, the main hypothesis that work-life balance should suffer as a result of technology overload was not substantiated. Although, this study did find a strong positive association

between technology overload and overtime, moreover, overtime strongly and negatively predicts work-life balance. Therefore, it appears that technology overload does not contribute negatively to work-life balance directly, but through an increased overtime. Future research are needed to explore this alternative explanation.

英文關鍵詞：Technology overload, overtime, work-life balance, psychological well-being, human resource policy

Had enough? Workplace technology overload on employees' psychological well-being: the role of the human resources department

Abstract

Technology has produced a profound impact on human beings in modern society. In Taiwan, popular social networking tools such as Facebook and Line are being used to connect work group members, making the distinction between work and life difficult. When work spills over to personal life, negative effect such as work-life imbalance and lower psychological well-being may occur in the workplace. This study seeks to study the general phenomenon of technology overload in the workplace in Taiwan by investigating its effect on employees' work-life balance perception and psychological well-being. Also, to address the gap in literature in identifying potential solutions of workplace technology overload, this study proposes to examine Human Resources Departments' responses to technology overload as a moderator to the main relationship of technology overload and psychological well-being. This study collected from a convenience sample of 448 knowledge workers in Taiwan through on-line and paper-based questionnaires. As expected, work-life balance is found to positively predict psychological well-being in this study. Also, three HR policies were found to strengthen the relationship between technology overload and work-life balance. However, the main hypothesis that work-life balance should suffer as a result of technology overload was not substantiated. Although, this study did find a strong positive association between technology overload and overtime, moreover, overtime strongly and negatively predicts work-life balance. Therefore, it appears that technology overload does not contribute negatively to work-life balance directly, but through an increased overtime. Future research are needed to explore this alternative explanation.

Keywords: Technology overload, overtime, work-life balance, psychological wellbeing, human resource policy

Introduction

Technology is reshaping our lives. The advancement of technology has been a dominant force in improving and enhancing services and productivity. However, its fast development and extensive coverage of almost every aspect of human activity has made it an integral part of the world. More importantly, it has produced a profound impact on human beings in modern society. People are becoming attached to their mobile devices and their attentions are constantly occupied by information or entertainment provided through the technology. On the work side, the connectivity of internet technology keeps pushing the pace and round-the-clock activity onto employees to a new limit.

Technology never needs rest, but human beings do. The feeling of "always on the job"

may lead to conditions of "overload" which may in turn cause psychological or physical discomfort or illness. Economic development has pushed many societies to new wealth and prosperity in recent years, and people are putting more emphasis on physical as well as psychological health. Nowadays, the most population in workplace is generation Y (Gen Y). Gen Y workers which are individuals that were born after 1980 have become a stronger and larger group in the workplace, and they take growth and personal life as two important components to be happy in work place (Baldonado & Spangenburg, 2009). As workplace technology overload is likely to spill over and affect employees' personal life, the issue becomes more prominent in the Y generation, because they are also the ones born or raised in the digital age and have the highest tendency to suffer technology overload without knowing it.

Scholars have pointed out that the well-being of employees is very important in organizational management, because a happy workforce is one of the key factors leading to organizational performance. To keep employees happy and motivated in workplace has always being a key issue in an organization's human resource practices. Wright and Cropanzano (2004, p. 338) pointed out, "It is reasonable and highly practical for both business executives and management scholars to understand that happiness is a valuable tool for maximizing both personal betterment and employee job performance." Therefore, it is crucial to understand what leads employees to a feeling of happiness and psychological well-being in the workplace, also, how to create an organizational atmosphere that is conducive to employee happiness and psychological well-being.

This study seeks to study the general phenomenon of technology overload in the workplace in Taiwan by investigating its effect on employees' work-life balance perception and psychological well-being. Also, to address the gap in literature in identifying potential solutions of workplace technology overload, this study proposes to examine as a moderator to the above relationship, the Human Resources Departments' response to technology overload.

Literature Review

Research on Technology and Its Negative Outcomes

Formal research on the possible negative effect of technology on psychological well-being can be dated back to the late 90's when internet started to replace other forms of communication. A seminal work conducted by Kraut, et al. (1998) looked into the social and psychological impact of the Internet using longitudinal data on 169 people in 73 households during their first 1 to 2 years on-line. Their findings provided a consistent picture of the consequences of using the Internet. They reported "greater use of the Internet was associated

with small, but statistically significant declines in social involvement as measured by communication within the family and the size of people's local social networks, and with increases in loneliness, a psychological state associated with social involvement. Greater use of the Internet was also associated with increases in depression. Other effects on the size of the distant social circle, social support, and stress did not reach standard significance levels but were consistently negative." (p. 1028)

Since then, there has been many studies devoted to the same issue. A meta-analysis was conducted by Huang in 2010 of 40 studies on Internet use and psychological well-being. The analysis found a small detrimental effect of Internet use on psychological well-being, as measured by depression, loneliness, self-esteem, and life satisfaction. However, the research did not find significant effect of moderators, including type of Internet use, indicator of well-being, quality of Internet use measure, and participant age and gender, and thus suggested that future investigations should consider the possible sources of differences to explain the variation in the relationship between Internet use and psychological well-being.

Çikrıkci (2016) reported another meta-analysis which included 23 studies in the analysis. This study comprised a sample group of 21,054 individuals, with a mean age of 20.32 years. According to the results of the analysis using the random effect model, internet use has a significant effect on well-being at low levels. This study also did not find suitable explanation of the variation in the relationship investigated. Results of moderator analysis showed that the well-being components were not significant moderator variables of the effect of internet use on well-being.

A few more studies on the subject in 2016 examined the negative effect of technology on adolescence and young adults (see Choi, & Lim, 2016 as an example). To date, the majority of the research on the undesired consequences of technology has focused on adolescence and young adults as the sample, and the phenomenon investigated exists in general lives. Research on the negative effect of technology in workplace in terms of how it affects work behaviors and work-life balance of the contemporary workforce is relatively rare. Only a few scholars focused their attention on technology's detrimental effect on employee outcomes in the workplace, such as Ahmad, Amin, & Ismail, (2009), Chen, & Muthitacharoen, (2016), Kakabadse, Porter, & Vance (2009), Karr-Wisniewski & Lu (2010), the work of Tarafdar, Ragu-Nathan, and other colleagues (2007, 2008, 2011). Moreover, the changes in employees' well-being in the digital society are still not well understood.

Technology Overload in the Workplace

Technology Overload in the Workplace is a phenomenon created by "the reciprocal nature of excess work and technology use" (Kakabadse, Porter, & Vance, 2009, p.1). Information and communication technology (ICT) undoubtedly facilitates our work activities in many aspects, making our lives more convenient each day. However, with the advancement and prevalence of ICT, people nowadays tend to depend so much on it that negative consequences begin to appear. These negative outcomes can be generally called technology overload.

According to Karr-Wisniewski and Lu (2010), technology overload is defined as a phenomenon that negative outcomes occur when the technology use exceeds the optimum level. See Figure 1 as an illustration. It is the core factor that results in negative consequences due to the excessive use of ICT (Moore, 2000). Technology overload can be directly linked to several undesirable outcomes, such as high level of stress, burnout, low productivity and work-life imbalance (Diaz, Chiaburu, Zimmerman & Boswell, 2012; Karr-Wisniewski & Lu, 2010).

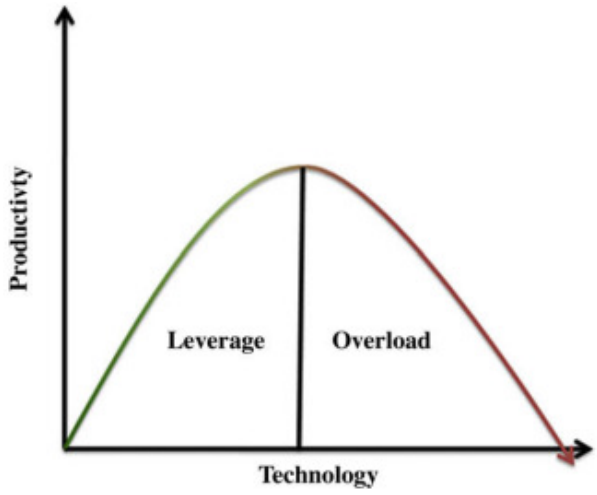

Figure 1. Technology oerload and the law of diminishing marginal returns.
Source: Karr-Wisniewski & Lu (2010)

Founded on the theories of technology dependence, cognitive load theory, bounded rationality, and human interruption theory, Karr-Wisniewski and Lu (2010) developed, pre-tested and validated a scale measurement for technology overload and its distinct dimensions which include information overload, communication overload, and system feature overload. They used the instrument to explore the relationship between technology overload and knowledge worker productivity. The result suggests that "knowledge workers who are highly

dependent on technology are impacted more significantly by information, system feature, and communication overload than those who do not heavily rely on technology to be productive at their jobs." (p. 1068)

Work-Life Balance

Many scholars provided definitions of work-life balance. De Cieri, Holmes, Abbott & Pettit (2005) define work-life balance from an employee perspective as "the maintenance of a balance between responsibilities at work and at home" (p.90). Byrne (2005) described work-life balance as "juggling five aspects of our lives at any one point in time: work, family, friends, health and spirit" (p. 54). Carless & Wintle (2007) described work-life balance from the employer's perspective, as "assisting employees in balancing the demands of work with those of their non-work activities" (p.395). According to Tolhurst (2010), "work-life balance refers to the level of control over the conditions in one's workplace and its harmony with a person's private life" (p. 431).

The term work-life balance originated from "work–family balance." Kirchmeyer (1995) described work-family balance as "the extent to which individuals are equally engaged in and equally satisfied with work and family roles" (p.516). Clark (2000) further defined work-family balance as "satisfaction and good functioning at work and at home within a minimum of role conflict" (p.748). Research on work-family balance indicated that work and family life impacts each other significantly which lead to more studies on the interaction between one's work and family life (Greenhaus & Beutell, 1985).

However, due to technological advancements, the border between work and family begins to blur. Workers no longer only work in the factories, instead, they can work anywhere, even at home or when they are with their families. The invention of a series of internet technology has changed the typical work patterns with computers and mobile devices collapsing the boundary between work and family. With changes in working arrangements, more research began to focus on the border of work and non-work life (Hochschild, 1997). For example, Hayman (2005) broaden the scope of the non-work life by developing a measure of work/non-work rather than work-family. Furthermore, research suggested that young workers begin to desire for leisure and work-life balance long before they have families (Twenge et al., 2010). According to Ehrhart, Mayer & Ziegert, (2012), the term "work-life balance" emerged because of societal trend such as shifts in the composition of the workforce. Younger workers

appear to place more significant emphasis on balancing work and personal goals (Carless & Wintle, 2007).

Psychological Well-being

Psychological well-being, sometimes called personal wellbeing (PWB) or subjective well-being (Wright,Cropanzano, and Bonett, 2007) is defined as the overall effectiveness of an individual's psychological functioning (Wright, 2005). Unlike job satisfaction, PWB has significant cognitive and affective components, which is primarily an affective or emotional experience (Wright,Cropanzano, and Bonett, 2007). According to Lu's study in 1995, subjective well-being has many labels, including happiness, objective well-being, subjective well-being, quality of life, and life satisfaction. Also, she pointed out that happiness is generally viewed as an emotion or feeling state, whereas life satisfaction refers to a more cognitive or judgmental process (Lu, 1995).

Wright & Cropanzano (2000) believe psychological well-being is usually defined in terms of the overall effectiveness of an individual's psychological functioning. It measures the hedonic or pleasantness dimension of individual feelings. Unlike job satisfaction, which is centered around the work context, psychological well-being is a broader construct. Most typically, psychological well-being is considered as a primarily affective-based "context-free" or global construct. From the viewpoint of the happy-productive worker hypothesis, they also believe that psychological well-being is more predictive of performance because job satisfaction provides less of a test of happiness.

According to Wright and Cropanzano's study in 2000, in long term, the relationship between psychological well-being and important organizational outcome variables such as performance and turnover will be an important issue, and affective commitment can also be an important organizational outcome. In many cases of psychological research, a particular behavior or state of mind is most likely produced by a complex interaction between the individual and environment. Previous research, based on the interaction perspective, revealed that both personal and environmental factors are important correlates of psychological well-being (Lu, 1996, 1999).

Technology Overload and Work-life Balance

Clark (2000) defined work-life balance as satisfaction and good functioning at work and

at home, with minimum role conflict. It is a balance situation of personal time, family care and work domain. Generally, technology overloaded individuals will receive more information than they can process; meanwhile they will spend more time on using and exchanging additional information than required (Choi & Lim, 2016; Tarafdar, Tu, Ragu-Nathan & Ragu-Nathan, 2007). An individual will experience an invasion of work domain to their personal and family time due to the constant connection to work. It may cause fatigue and negative emotions. Besides, it hampers individuals' time to participate in family activities, which may further result in work-family conflicts (Lapierre & Allen, 2006). As previous research proposed, constantly connecting to work through technology may come with a price of conflict within personal and family lives (Diaz, Chiaburu, Zimmerman & Boswell, 2012). Therefore, the following hypothesis is proposed:

H1: Technology overload has a negative effect on employee's work-life balance perception.

Work-life Balance and Psychological Well-being

Due to the convenience of information and communication technology, people nowadays constantly connect to work for long hours. Research showed that individuals who often work overtime tend to have higher level of depression and anxiety as well as work-life imbalance (Kleppa, Sanne & Tell, 2008; Dex & Bond, 2005). In addition, individuals who spend substantial time on work experience a lower quality of life than those who spend more time on personal and family lives (Greenhaus, Collins & Shaw, 2002). All these outcomes from jeopardizing the work-life balance condition can be generalized into the aspects of psychological well-beings.

Psychological well-being is a comprehensive term that includes happiness, satisfaction and dimensions of quality of life such as vitality, anxiety, depression and so on (Hallberg, Hallberg & Kramer, 2008). From previous studies, quality of life and work-life balance issues are proven to be related to individuals' psychological well-being (Frone, 2000; Wilkinson, 2013). Once the boundary between work and life is no longer clear, overloaded individuals will experience a real struggle trying to balance work and personal life, making them hard to meet their personal demands. They will then experience frustration, anxiety, low quality of life and feel dissatisfied with the situation they are in, ultimately, imposing a negative effect on their psychological well-beings (Wilkinson, 2013). Thus, the following hypothesis is proposed:

H2: Employee's work-life balance perception is associated with their psychological well-being.

The Human Resources Response to Technology Overload

The Human Resources Department (HR) plays a strategic role in the modern organization. In order to meet the needs of both employees and employers, and position HR as a significant contributor to organizational success, Ulrich (1997) advocated a multi-faceted approach to delivering HR services through four corresponding roles for HR to play within a business: a) as a strategic partner working to align HR and business strategy, b) as an administrative expert working to improve organizational processes and deliver basic HR services, c) as an employee champion, listening and responding to employees' needs, and d) as a change agent managing change processes to increase the effectiveness of the organization.

The modern organization full of new tools and new potential risks brought by technology advances requires employees to constantly learn and adapt. The HR as a change agent is responsible for monitoring the challenges of technology overload and actively address the issues through change programs. Tarafdar, et al. (2015) suggested a few things HR leaders can do to help organizations combat the detriments brought by technology. The first is to assess the extent of the negative effects of technology. HR can work together with IT leaders to create programs and audit exercises to measure and monitor the inappropriate computer use behaviors and their negative consequences. The second is to improve employees' sense of well-being at work, which can be done through internal company policies such as limiting IT use after hours, provide warning signs when improper or excessive use is detected, and training employees on the risks associated with technology overload. Creating a positive and supportive work environment will also help reduce misuse of technology. Thirdly, HR can consider tailoring organizational policies on information technology to individual-specific traits, and create awareness programs to educate employees on personal differences in responding to communications made through technology. Lastly, HR should be prepared to take complex courses of action, which may include organizational, legal and medical, to deal with deviant use, stress and addiction related to technology. The suggestions described above are assumed to alleviate the negative effect of technology overload or misuse on employees, therefore, the following hypothesis is offered:

H3: The human resources response has a moderating effect on the relationship

between technology overload and work-life balance.

Methodology

Research Design

This study proposes a mixed-method design. One of the unique contribution of this study is to provide evidence of the moderating effect of human resources response to technology overload. Although scholars have attempted to offer suggestions, actual company practices in this regard are not well documented. In order to modify and develop suitable measurement on human resources response to technology overload, a qualitative approach was adopted first before quantitative data collection. To form the measurement for human resources response, a focus group interview of senior HR managers and company executives was conducted to verify a list of human resource policies compiled from the literature. Once the measurement was ready, a quantitative approach was taken to test hypotheses using data collected from a survey questionnaire. Figure 2 shows the research framework.

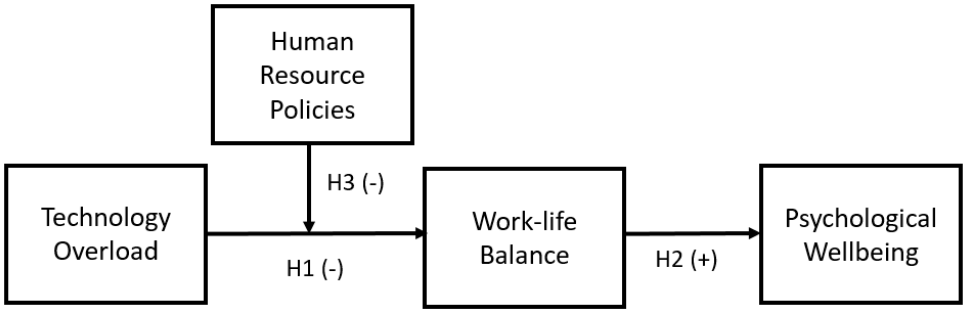

Figure 2. Research Framework

Sampling and Data Collection

White-collar workers or so-called knowledge workers in Taiwan were the population of this study. Mail survey was used as the primary data collection method accompanying the use of web-based survey. Knowledge workers are suitable population in this study because their jobs are often carried out using computers and internet technology. They are probably also the cohort that is exposed to most technology overload. The high level of technology adoption and internet readiness in Taiwan also makes this population most vulnerable to the risk of technology overload. The literature reviews also found few research efforts targeting the workplace in Taiwan in the related topic, which serves as another justification of the sample

selection.

Sample was drawn across industries and regions using convenience sampling method. The sampling criteria is office staff who had at least 3-month tenure in the current company. Both web-based survey and mail survey method were used to reach the research sample. The survey questionnaire was translated into appropriate language for the samples. Back translation was used to ensure proper translation of all measurement items and survey instructions. The data collection effort took place between December 2018 and April 2019, and generated 448 valid responses.

Measurement

Technology overload Karr-Wisniewski & Lu's (2010) definition and measurement for technology overload was adopted for this research. They define technology overload as the phenomenon that negative outcomes occur when the technology use exceeds the optimum level. The measurement has three dimensions with a total of 12 items. The measurement had gone through thorough development and reported satisfactory validity and internal consistency. See table below for the dimension, number of items in each dimension and a sample item from each dimension.

Table 1. Karr-Wisniewski & Lu's (2010) measurement of technology overload.

Dimension	# of items	Sample item
Information overload (Cronbach's a = 0.72)	3	I find that I am overwhelmed by the amount of information I have to process on a daily basis.
System feature overload (Cronbach's a = 0.78)	5	The software packages I use for work are often more complex than the tasks I have to complete using these packages.
Communication overload (Cronbach's a = 0.73)	4	I often find myself overwhelmed because technology has allowed too many other people to have access to my time.

Work-life Balance Perception The work-life balance perception was measured using the four-item measurement created by Brough, et al. (2014). Brough, and her collegues developed and validated a measure of work–life balance in 2014, based on individuals' subjective perceptions of balance between their work and other aspects of their lives. The researchers tested the

measurement on four independent heterogeneous samples of workers employed in Australia and New Zealand and confirmed that this new measure of work–life balance demonstrates robust psychometric properties and predicts relevant criterion variables. The structure, reliability and validity of this unidimensional, four-item measure was confirmed. Using a 5-point Likert scale (1 stands for strongly disagree and 5 stands for strongly agree), participants were asked to reflect over their work and non-work activities over the past three months. A sample item is "I currently have a good balance between the time I spend at work and the time I have available for non-work activities."

Psychological Well-being Psychological well-being was measured by the Psychological Flourishing Scale (PFS) provided by Diener, E. & Biswas-Diener, R. (2008). This scale measures not only how people generally feel good about their life, but also whether key aspects of psychological wealth, such as strong social relationships, self-respect, competence, engaging work, and spirituality, are in place, and whether life has purpose and meaning. The PFS contains 12 items and are answered through a 7-point Likert scale (1 being strongly disagree and 7 being strongly agree). Sample items include: "I am engaged and interested in my daily activities," and "I generally trust others and feel part of my community."

Human resources response to technology overload The list provided by Tarafdar, et al. (2011) on the "mechanisms inhibiting creating-conditions and outcomes of technostress" served as the basis for developing the measurement of human resources response to technology overload. In order to better fit the context of this study, the researcher verified the items through a focus group interview to create a list of human resources response to technology overload which included the following company policies.

1. Employees are not allowed to connect to company's internet to send and receive mail after they leave the company.
2. If you login to the computer in the company, you will be reminded when you work overtime.
3. Employees' laptops are not allowed in the company.
4. Employees' personal mobile phones are not allowed in the company.
5. Company's mobile phones or laptops are not allowed to be taken home. All of the work should only be completed within the company.
6. Company has programs and audit exercises to measure and monitor the inappropriate computer use behaviors and their negative consequences.
7. Company limits IT use after hours.
8. Company system will provide warning signs when improper or excessive use is

detected.

9. Company has created awareness programs to educate employees on personal differences in responding to communications made through technology.
10. Company is prepared to take complex courses of action, which may include organizational, legal and medical, to deal with deviant use, stress and addiction related to technology.

Control variables Work-life balance is often associated with overtime and workaholic behavior. Therefore, the study also collected these two variables and controlled them in the hypothesis testing.

Validity and Reliability of Measures

Prior to conducting substantive analyses, each of the construct was examined for unidimensionality using exploratory factor analysis. Then, responses were entered into a confirmatory factor analysis (CFA) using AMOS to test whether the measurement model fits the data. The CFA result of the overall three-factor model shows good fit without modifying any items in the measurement models. The CR and AVE of each variable also indicate good convergent validity. See Table 2 and Figue 3 for the CFA result.

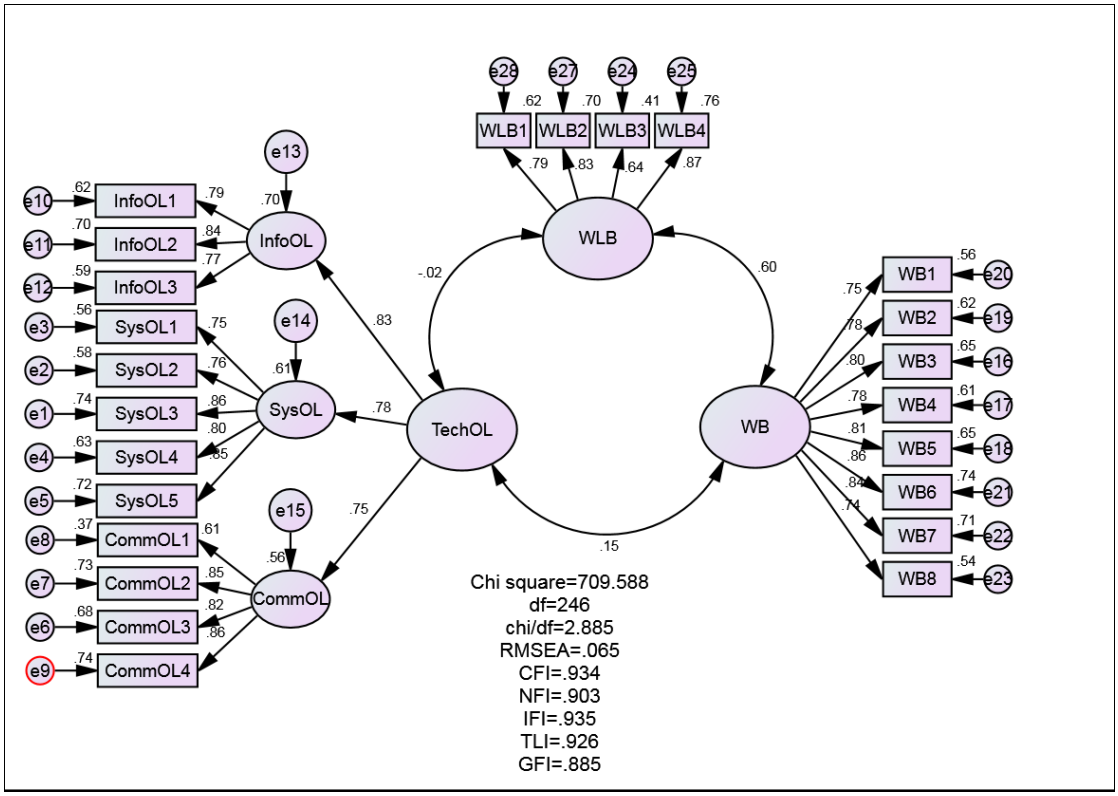

Figure 3. Confirmatory Factor Analysis Result

Table 2. Confirmatory factor analysis of the variables

	χ^2	χ^2/df	RMSEA	CFI	NFI	IFI	TLI	GFI	CR	AVE
Technology overload	190.78	3.741	.078	.957	.943	.958	.945	.936	.831	.621
Psychological well-being	159.06	7.953	.125	.946	.938	.946	.924	.920	.933	.635
Work life balance	34.93	6.99	.116	.967	.962	.967	.934	.972	.816	.504
Work life balance	34.41	17.21	.190	.964	.962	.964	.892	.966	.867	.622
Three-factor measurement model	709.59	2.885	.065	.934	.903	.935	.926	.885		

Data Analysis and Findings

As shown in Table 3, which shows the demographic profile of the study sample, the overall sample size is 448, with 63% female and 37% male. The majority of the sample holds a college degree (62%), is not married (66%), works as an office staff (68%) at the non-managerial level. A 37% of the sample use computer 80-100% of the time on the job. Although the majority does not seem to have a lot of overtime (60% less than 5 hours per week), 24% reports 5-10 hours of overtime each week.

Table 3. Demographic of the respondents (N = 448)

	n	%		n	%
Gender			*Hours of overtime*		
Female	283	63.2	Less than 5 hours	268	59.8
Male	165	36.8	5 to 10 hours	106	23.7
			11 to 15 hours	32	7.1
Education			16 to 20 hours	18	4.0
High school or below	63	14.1	21 to 25 hours	8	1.8
College	277	61.8	26 to 30 hours	3	0.7
Master	103	23.0	More than 30 hours	13	2.9
Doctoral (Ph.D)	5	1.1			
			Industry		
Marital status			Agricultural, forestry, fishing,	6	1.3

Single	287	64.1	& animal husbandry		
Married	153	34.2	Mining & quarrying	2	0.4
Divorced or widowed	8	1.8	Electricity & gas supply	2	0.4
			Construction	18	4.0
Job position Level			Manufacturing	77	17.2
Non-management level	363	81	Wholesale & trade	28	6.3
Supervisor	52	11.6	Retail	28	6.3
Manager	32	7.1	Transportation & storage	8	1.8
Executive	1	0.2	Information & communication	19	4.2
			Financial & insurance	67	15.0
Type of work			Real estate & leasing	7	1.6
Office staff	305	68.1	Education	53	11.8
Field staff	36	8.0	Human health & social work services	26	5.8
Office and field staff	107	23.9	Professional, scientific, & technical services	38	8.5
Use of computer or communication software			Art, entertainment, & recreation	9	2.0
			Accommodation & catering	14	3.1
0~20%	57	12.7	Public administration	14	3.1
21~40%	62	13.8	Others	32	7.1
41~60%	67	15.0			
61~80%	91	20.3			
81~100%	167	37.3			
Missing value	4	0.9			

Correlations were utilized to find initial and linear relationships between research constructs. It appears that overtime is strongly and positively correlated to job position (r=.24, p<.001), workaholism (r=.14, p<.001) and technology overload (r=.15, p<.01), while negatively correlated to work-life balance (r=-.33, p<.001). Job position is positively correlated to psychological well-being (r=.12, p<.01). Workaholism is strongly and positively correlated to technology overload (r=.43, p<.001) and psychological well-being (r=.16, p<.001). Work-life balance is also strongly and positively correlated to psychological well-being (r=.53, p<.001). Technology overload was found to correlate positively with overtime (r=.16, p<.01), workaholism (r=.43, p<.001), and psychological well-being (r=.12, p<.05).

Table 4. Mean, standard deviation, correlation, and reliability

	M	*SD*	1.	2.	3.	4.	5.	6.

1.	Overtime	1.780	1.334					
2.	Job position	1.266	.593	.244***				
3.	Workaholism	3.441	.606	.136***	.091	(.754)		
4.	Technology overload	4.321	1.037	.155**	.059	.429***	(.913)	
5.	Psychological well-being	5.136	1.011	-.028	.124**	.156***	.118*	(.932)
6.	Work life balance	3.481	.784	-.326***	-.025	-.013	.004	.531*** (.858)

Notes.
*p <.05, **p < .01, ***p < 0.001
Number in the parentheses indicate Cronbach's alpha
Workaholism measured by 5 points Likert scales, Technology overload measured by 7 points Likert scales, Psychological well-being measured by 7 points Likert scales, Work life balance measured by 5 points Likert scales.

Hierarchical regression was performed to test the research hypotheses, with overtime and workaholism as the control variables. Table 5 and Table 6 show the regression analysis results. Hypothesis 1 stated that technology overload has a negative effect on employee's work-life balance perception. As seen in model 2 of Table 5, this hypothesis is not supported (β=.05, *n.s.*). Hypothesis 2 stated that employee's work-life balance perception is associated with their psychological well-being. Model 3 in Table 6 provides strong evidence that supports this hypothesis (β=.57, p<.001). Hypothesis 3 proposed that the human resources response has a moderating effect on the relationship between technology overload and work-life balance. Three HR policies were found to have significant interaction effect (β=.10, p<.05; β=.13, p<.01; β=.12, p<.01), which are shown in model 3-6 of Table 5.

Table 5. Hierarchical regression analysis of technology overload, HR policy 2, HR policy 4, and HR policy 5 on work life balance (N = 448)

	Work life balance				
Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Controls					
Overtime	-.330***	-.335***	-.327***	-.333***	-.335***
Workaholism	.032	.010	.000	.006	-.003
Main effect					
TechOL		.052	.045	.040	.055
Interaction					

TechOL * HRpolicy 2			.104*		
TechOL * HRpolicy 4				.134**	
TechOL * HRpolicy 5					.120**
R^2	.107	.109	.120	.127	.124
Adj. R^2	.103	.103	.112	.119	.116
F	26.730***	18.178***	15.088***	16.119***	15.618***
ΔR^2	.107	.002	.011	.018	.014
ΔF	26.730***	1.067	5.291*	8.962**	7.178**

Notes. TechOL = Technology overload; *$p < .05$. **$p < .01$, ***$p < .001$

Table 6. Hierarchical regression analysis of technology overload and work life balance on psychological well-being (N = 448)

	Psychological well-being		
Variables	Model 1	Model 2	Model 3
Controls			
Overtime	-.050	-.057	.136**
Workaholism	.163**	.135**	.129**
Main effect			
TechOL		.069	.039
Work life balance			.577***
R^2	.027	.031	.327
Adj. R^2	.023	.024	.321
F	6.165**	4.703**	53.818***
ΔR^2	.027	.004	.296
ΔF	6.165**	1.757	195.001***

Notes. TechOL = Technology overload; *$p < .05$. **$p < .01$, ***$p < .001$

Discussion and Conclusions

As expected, work-life balance is found to positively predict psychological well-being in this study. Also, three HR policies were found to strengthen the relationship between technology overload and work-life balance: HRpolicy2：If you login to the computer in the company, you will be reminded when you work overtime; HRpolicy4：Employees' personal mobile phones are not allowed in the company; and HRpolicy5：Company's mobile phones or

laptops are not allowed to be taken home. All of the work should only be completed within the company. These results help explain the variation in the relationship among technology overload, work-life balance, and psychological well-being in organizations.

However, as one of the first studies in Taiwan in the effect of technology on employee outcomes, this study came across very unexpected but interesting results. The main hypothesis that work-life balance should suffer as a result of technology overload was not substantiated. Technology overload also does not predict psychological well-being. The research team is puzzled by this result and is still looking for potential theoretical explanation. Although, this study did find a strong positive association between technology overload and overtime, meaning when respondents reported a higher level of technology overload, they also reported more overtime hours. Moreover, overtime strongly and negatively predicts work-life balance. Therefore, it appears that technology overload does not contribute to work-life balance directly, but through an increased overtime.

More analysis of the data is needed to sort out the complex relationship among our study variables and control variables. In addition, as suggested in the literature review, the effect of technology overload may be curvilinear instead of linear.

Contributions of the Study

This research adds to the literature of technology overload in the workplace from the perspective of the role of HR department as a change agent. Two distinct contributions can be noted, one theoretical and one practical. The theoretical contribution is in introducing the HR department response to technology overload as a moderator to explain the variation in in the relationship among technology overload, work-life balance, and psychological well-being in organizations. This research hopes to find a significant role of the HR to fill the gap in the literature of a lack of convincing moderators as reported in the meta-analysis of Huang (2010) and Çikrıkci (2016).

The practical contribution of this research comes from the qualitative part will generated plausible learnings collectively from the HR profession in combating the negative effect of technology. These possible responses were tested quantitatively in the proposed model serving as moderators between the relationship between technology overload and work-life balance. This research provided empirical evidence of HR practices that help enhance work-life balance in the presence of technology.

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出席國際學術會議心得報告

計畫編號	MOST 106-2410-H-003-128 -SSS
計畫名稱	你累了嗎？職場科技超載對員工心理健康的影響：人力資源管理的角色
出國人員姓名 服務機關及職稱	葉俶禎 – 國立臺灣師範大學國際人力資源發展研究所副教授
會議時間地點	2018 年 11 月 5-11 日，泰國曼谷
會議名稱	2018 Academy of Human Resource Development Asia Conference
發表論文題目	1. Female Entrepreneurs in Honduras: Factors that Affect their Performance in Micro and Small Enterprises 2. Factors Influencing Teachers' Intention to Participate in Certification Education: A Study on Continuing Professional Development of Teachers in Belize

一、 參加會議經過

本次出國行程重點除了參加 2018 Academy of Human Resource Development Asia Conference，由於該會議不但是 HRD 學會的亞洲旗艦會議且今年是正在與本人執教之師大人資所洽談合作事宜的 NIDA 學院主辦，因此由本所所長、教師、研究生及本人總共 5 人前往，行程也增加許多交流與參訪活動。感謝有科技部補助出國參與國際會議經費，使本人也能參與此次行程。會議經過及行程如下：

- 107 年 11 月 05 日: 從桃園國際機場出發到曼谷
- 107 年 11 月 06 日: 至 National Institute of Development Administration (NIDA) 大學參訪。
- 107 年 11 月 07 日: 早上－拜訪 NIDA 研究所教授；下午－與南韓首爾大學 (Seoul National University) Chan Lee 教授商討合作事宜。傍晚前往朱立隆功大學探視本所在此交換學生。

- 107 年 11 月 08 日: 早上－參與由拜訪學校 (NIDA) 舉辦之 2018 Academy of Human Resource Development Asia Conference.
- 107 年 11 月 09-10 日: 參加 2018 Academy of Human Resource Development Asia Conference.
- 107 年 11 月 11 日: 從泰國曼谷機場出發回台北

二、 與會心得與收穫

11/6 (二) 早餐: 與 University of Illinois Dr. Ron Jacobs 交流，之後前往 NIDA 全天交流 – 早上九點到達 NIDA 舉辦 One-day Seminar 之會場，參與本場研習會的成員包括 NIDA 之院長與教授、碩士與博士生、明尼蘇達大學之 Dr. Kenneth R Bartlett 與其研究生代表、韓國首爾大學之 Dr. Chan Lee、IHRD 三位教授與其研究生代表；第一個場次為各校系所之介紹─NIDA、IHRD、以及 University of Minnesota 之系所介紹； IHRD 之系所介紹由葉俶禎教授與張婎雯所長主持，並由三位研究生陳思諭、鍾東諺、陳怡君介紹 IHRD 系所，並分享學習經驗，推廣本校優良及多元之跨文化學術環境。今日並與首爾大學 Dr. Chan Lee 確認學術交流合作備忘錄。是忙碌而充實的一天。

11/7 (三) 早上－拜訪 NIDA 研究所教授，參觀校園，增加本所與 NIDA 師生交流機會；下午－與南韓首爾大學 (Seoul National University) Chan Lee 教授了解學生交換機會及至首爾大學招生計畫之可能性。傍晚前往朱立隆功大學了解本學期交換生陳怡君之交換情形；由研究生陳怡君帶領葉俶禎教授、張婎雯所長、林怡君教授、與研究生鍾東諺、陳思諭參觀校園，經陳怡君同學之導覽與介紹朱立隆功大學身為泰國首席大學之優質學術環境。晚間與畢業校友晉羚莉聚餐，除了解畢業校友就業狀況外，也藉此了解泰國人力資源市場現況。

11/8 (四) 早餐與 University of Minnesota Dr. Kenneth R Bartlett 洽談來台事宜，之後便開始 AHRD 之國際學術研討會。此次 AHRD 邀請 NIDA 大學之教授 Dr. Chartchai Na Chiangmai 與 首爾大學的產業人力開發學所所長 Dr. Chan Lee 發表學術演講，茶敘與餐敘時間教授與研究生皆與國外學者有充分地互動與交流，除了解

其他國家之學術環境，也尋找機會洽談未來可能之學術合作，在下午之場次成功發表一篇學術研究。

11/9 (五) 下午持續參與 AHRD 會議，並在下午之場次成功發表第二篇學術研究。

此次的研討會因為增加了前面的 NIDA 參訪，與許多學者在會前就有互動交流的機會，更為熟悉，是相當難得的機會。能與同事與學生同行更增加許多趣味及國際聲量，許多學者主動來打招呼，讓台灣、師大、及我們人資所的研究能量被世界看見，同時也成功邀得二位國際學者同意來我們所上短期授課，可謂收穫良多。

三、 交流及會議照片

11/6

	
國際人資所所長張婉雯介紹本所	研究生陳怡君介紹與分享學術環境

	
NIDA 人力資源發展所所長介紹學術環境	One-day Seminar 團體合照
	
One-day Seminar 出發前團 IHRD 團體合照	IHRD 與首爾大學產業人力開發學所所長 Chan Lee 教授簽署 MOU 合約

11/7

	
張婦雯所長、林怡君教授、葉俶禎教授於朱立隆功大學商業管理學院前合影	與畢業校友聚餐
	
張婦雯所長、林怡君教授、葉俶禎教授與交換學生陳怡君於大學商業管理學院前合影	於朱立隆功大學內合影

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<tr><td>Dr.Chan Lee 於 AHRD conference 發表學術演講</td><td>AHRD conference 當天與伊利諾大學香檳分校 HRD 所之 Dr. Ron Jacobs 合影</td></tr>
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<tr><td>研究生鍾東諺發表學術研究</td><td>葉俶禎教授發表學術研究</td></tr>
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研究生陳思諭發表學術研究	與 University of Minnesota 的 Dr. Kenneth R Bartlett 洽談來台事宜

四、會議論文摘要：

Female Entrepreneurs in Honduras: Factors that Affect their Performance in Micro and Small Enterprises

Abstract

Entrepreneurship is an important driver of economic growth in most developing countries. In the past decades more females are being motivated to start their own businesses. Using a quantitative approach, this research examined the effect of factors affecting the performance of 152 female entrepreneurs in micro and small businesses in Honduras by using Partial Least Square SEM. Based on the existing literature, a self-report questionnaire composed of six sections was designed. Results indicate that of the motivational factors, economic and personal motivation have a positive effect on performance, while of the human capital factors, business skills and the influence of the area of education. Regarding the use of networks, only the perceived support from mentors had a positive effect on performance. None of the environmental factors had a

significant influence on the performance of these female entrepreneurs. Of the demographics only the business sector had significant influence on performance. Discussion and implications of the findings are provided, which include business skill training, access to mentors and better government supports to sustain the development and growth of female entrepreneurs.

Keywords: entrepreneurship, female entrepreneurs, Honduras, micro and small enterprise, performance

Factors Influencing Teachers' Intention to Participate in Certification Education: A Study on Continuing Professional Development of Teachers in Belize

Abstract

Belize's educational system has been evolving since the early 1960's to provide quality and competent education to all students. Up to date, the struggle is still visible because the hallmark of the British colonization remains within the educational system. The practice of hiring teachers without proper training and certification in pedagogy has kept Belize at a disadvantage. This research intends to explore the possible factors that could be influencing teachers' participation in a teacher certification education program, in order to fill the demands of a rapid increase of students. A quantitative study was conducted on a sample of 206 uncertified teachers at all levels of education. Based on the literature of continuing professional development and a previous research, three personal factors, one task factor and two work environment factors were selected as the independent variables to predict the dependent variable, intention to participate in certification education. Hierarchical regression was used to test study hypotheses. Findings revealed that the personal factor, appraisal of meaningfulness, task factor, pressure of work, and the work environment factor, management support, have a positive influence on teachers' intention to participate in certification education. In addition, although not hypothesized, some demographic variables such as age, gender, and highest educational qualification level, also presented influence on teachers' intention to pursue certification education. These findings have important implications for the Belizean Ministry of Education on policies related to promoting teacher certification education.

Keywords: continuing professional development, teacher certification education, personal factors, task factors, work environment factors

106年度專題研究計畫成果彙整表

計畫主持人：葉俶禎	**計畫編號：**106-2410-H-003-128-SSS
計畫名稱：你累了嗎？職場科技超載對員工心理健康的影響：人力資源管理的角色	

成果項目					量化	單位	質化 （說明：各成果項目請附佐證資料或細項說明，如期刊名稱、年份、卷期、起訖頁數、證號...等）
國內	學術性論文	期刊論文			0	篇	
		研討會論文			1		已將研究成果投稿APA旗下的Technology, Mind, and Society 2019會議。
		專書			0	本	
		專書論文			0	章	
		技術報告			0	篇	
		其他			0	篇	
	智慧財產權及成果	專利權	發明專利	申請中	0	件	
				已獲得	0		
			新型/設計專利		0		
		商標權			0		
		營業秘密			0		
		積體電路電路布局權			0		
		著作權			0		
		品種權			0		
		其他			0		
	技術移轉	件數			0	件	
		收入			0	千元	
國外	學術性論文	期刊論文			0	篇	
		研討會論文			0		
		專書			0	本	
		專書論文			0	章	
		技術報告			0	篇	
		其他			0	篇	
	智慧財產權及成果	專利權	發明專利	申請中	0	件	
				已獲得	0		
			新型/設計專利		0		
		商標權			0		
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		積體電路電路布局權			0		
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		品種權	0		
		其他	0		
	技術移轉	件數	0	件	
		收入	0	千元	
參與計畫人力	本國籍	大專生	0	人次	
		碩士生	3		培養本所3位碩士班研究生參與研究資料收集、資料分析等研究技能。
		博士生	0		
		博士後研究員	0		
		專任助理	0		
	非本國籍	大專生	0		
		碩士生	0		
		博士生	0		
		博士後研究員	0		
		專任助理	0		
其他成果 （無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。）			本研究主題受到以色列學者的重視，已在洽談跨國合作在以色列收資料，若成功收集資料，將可進行與台灣的比較研究。		

科技部補助專題研究計畫成果自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現（簡要敘述成果是否具有政策應用參考價值及具影響公共利益之重大發現）或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估
   ■達成目標
   □未達成目標（請說明，以100字為限）
   　□實驗失敗
   　□因故實驗中斷
   　□其他原因
   說明：

2. 研究成果在學術期刊發表或申請專利等情形（請於其他欄註明專利及技轉之證號、合約、申請及洽談等詳細資訊）
   論文：□已發表　□未發表之文稿　■撰寫中　□無
   專利：□已獲得　□申請中　■無
   技轉：□已技轉　□洽談中　■無
   其他：（以200字為限）

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性，以500字為限）
   企業自動化加上網路科技的無遠弗屆，使得工作與個人時間的區分逐漸模糊，員工隨時隨地都可以上工。這原是企業與員工生產力提升的一大利器，但也能影響員工心理健康，使
   員工表現彈性疲乏。本研究探討科技應用與員工心理狀態的關係，並解析自我調節與管理措施的角色，帶領社會省思如何解決科技氾濫殃及員工福祉的現象。本研究發現了三項人力資源政策，可以改善職場科技超載與工作與生活平衡之間的關係。另外，這項研究發現職場科技超載和加班時數之間存在強烈的正相關關係，而且加班時數顯著地且負向地預測了工作與生活的平衡。因此，可推測職場科技超載似乎不直接對工作與生活平衡產生負面影響，而是通過增加加班時間。此發現對企業人員管理具重大參考價值。

4. 主要發現
   本研究具有政策應用參考價值：■否　□是，建議提供機關
   （勾選「是」者，請列舉建議可提供施政參考之業務主管機關）
   本研究具影響公共利益之重大發現：□否　□是
   說明：（以150字為限）