Alternative Organisational Learning Therapy: An Empirical Case Study Using Behaviour and U Theory

Li-An Ho
Tamkang University, Taipei, Taiwan

Tsung-Hsien Kuo
Securities and Futures Institute, Taipei, Taiwan

Abstract

This paper draws on the concept and process of deeper learning, namely the U theory (Senge, Scharmer, Jaworski, & Flowers, 2004a). As a driver to get a deeper exploration of organisational change process, the theory of U goes beyond the interpersonal aspects of learning, instead focusing on a deeper personal generative learning that emphasizes seven capacities along the deep learning process. Corporations in Taiwan have been striving in a globalised world economy for market competitiveness through organisational learning and change and this study seeks to understand adult workers' engagement with deep learing. Based on the theory of planned behaviour, the study investigated how personal backgrounds, attitude, perceived subject norm and perceived behavioural control affected adult workers' intention of deeper learning using Pearson correlation and stepwise regression analysis. Data were collected from working adults (N=512) in a high tech company located in Taipei. Results showed that there was a significant positive correlation between the independent variables, namely adult workers' attitudes, perceived social pressure, and behavioural control, and the dependent variables (i.e., the seven capacities within U theory). In addition, among three independent variables, subjective norm had the strongest predictive power on the successful diffusion of the U theory.

Introduction

Peter Senge, Otto Scharmer, Joseph Jaworski and Betty Sue Flowers (2004a) introduced the concept and process of deeper learning, namely the U theory (or U movement). Unlike the fifth disciplines that bring to light team learning and system thinking in organisational learning, the U theory goes beyond the interpersonal aspects of learning

and focuses on a deeper personal generative learning. Followed by numerous local studies in organisational learning (see, for example, Chen, Yang, & Shiau, 2006; Pai, 2006; Ju, Chen, Li, & Lee, 2005; Tsai & Tsai, 2005; Chen, Holton, & Bates, 2005; Lee & Tsai, 2005), scholars and practitioners have increased interests in exploring the possibility of adopting the U theory.

As with most attempts at innovation or change in organisations, the process of adaptation or diffusion of new ideas in many cases has faced challenges caused by different personal interests or behavioural habits (Rogers, 1995). Thus, it was considered crucial to shed light on how people perceived the theory of the U before proceeding with the actual implementation of the study. According to Andrykowski, Beacham, Schmidt, and Harper (2006), people's attitudes, perceived social pressure and behavioural controls are all characteristics of human behaviour that are modifiable. In fact, the theory of planned behaviour, which consists of attitude toward behaviour, perceived subjective norm, and perceived behavioural control, have been applied extensively to predict and explain behavioural intentions and actual behaviour (Millar & Shevlin, 2003). Existing literature shows plentiful examples of employing the planned behaviour theory in various settings to understand what contributes to human performance (for example, Dinev & Hu, 2007; Lepre, 2007; Shen, McCaughtry, & Martin, 2007; Walker, Jackson, & Deng, 2007).

This paper presents the results of an empirically-based study on adult workers in a high-tech manufacturing company. Planned behaviour theory was used as the basis of investigation. The investigation looked at how adult workers' attitude, perceived subjective norm (social pressure), and perceived behavioural control affected their intention to implement the U theory.

The literature section provides an overview of U theory process based on the work of Senge et al. (2004a), and particular emphasis is placed on the seven capabilities needed to accomplish the process. This is followed by a review of studies related to the theory of planned behaviour and together these form a basis for the structure of the investigation.

Literature Background

The U theory

In the *Fifth Discipline*, Senge (1994) gives us the concepts and methods of organisational learning and points out that the fundamental problem with most businesses today is that they are governed by mediocre ideas, such as maximizing the return on investment. In their new presentation of deeper learning strategy, Senge et al. (2004a) make a distinction between good ideas and governing ideas. Organisations must realize and

emphasize their beliefs and values that drive individual and group behaviours. Peter Senge et al. clarify that this calls for a deeper level of learning than the usual one of control systems and information with which people seek to manage their organisations today (Ramachander, 2005).

According to Senge Scharmer, Jaworski, and Flowers (2005), the deeper learning process, which generates the depth of understanding, consists of three stages: sensing, presencing, and realising (see Figure 1). It is also called the U movement. In the first stage (the upper left-hand side of the U), people become one with the world through in-depth observations, which allows deeper sensing to occur. In the sensing stage, the core capacities which allow people to immerse themselves to become "one with the situation" are suspending and redirecting. It is believed that when people suspend and redirect their attention, perception starts to arise from within the living process of the whole.

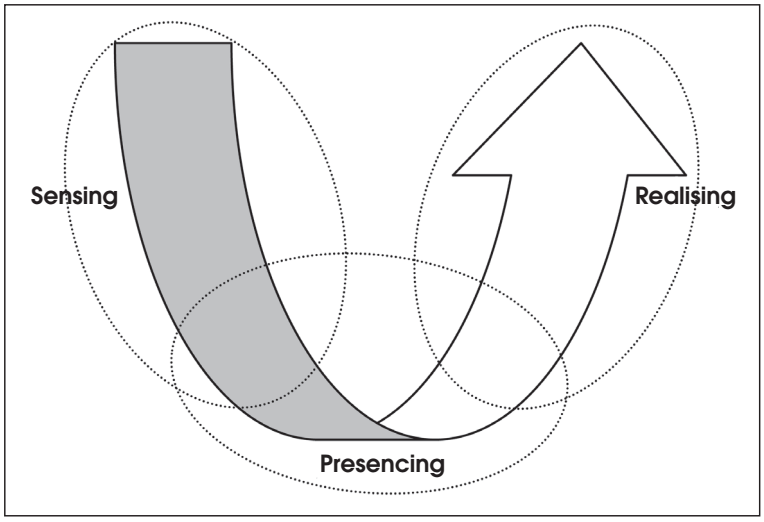

Figure 1: The U movement (taken from Senge, Scharmer, Jaworski, & Flowers, 2005, p. 219)

The second stage, located at the bottom of the U, is presencing. Presencing allows people's inner knowledge to emerge. When people are presencing, a perception moves further to arise from the highest future possibility that connects themselves and wholes. In the presencing stage, the core capacities which allow people to transform self-awareness and will are letting go and letting come. Moving up the U involves bringing something new into reality, just as in the standard model of learning, but this action comes from a source that is deeper than rational mind. In the final stage of the U (the upper right-hand corner), people sense something new and act instantaneously in accordance with what the perceived knowledge dictates. This is a stage where transformed awareness and emergence of new knowledge are put into actions. The core capacities at this stage are crystallizing, prototyping, and institutionalizing.

The entire U movement arises from seven core capacities (i.e., suspending, redirecting, letting go, letting come, crystallizing, prototyping, and institutionalizing). Each capacity is a gateway to the next activity. For example, the capacity for suspending enables throwing our habits of thinking and behaving, and the capacity for prototyping enables enacting living microcosms. The U movement through the entire deeper learning process is possible only once all seven capacities are developed. The key to the deeper levels of learning is the recognition that the larger living wholes of which people are an active part are not inherently static. Like all living systems, they both conserve functions essential to their existence and seek to evolve (Senge, Scharmer, Jaworski, & Flowers, 2004b).

Planned behaviour theory

Researchers and psychologists have been interested in formulating theories in an attempt to predict human behaviour in a wide variety of contexts. Particularly two related theories, the theory of reasoned action (TRA) and the theory of planned behaviour (TPB) have been applied extensively to predict and explain behavioural intentions and actual behaviour (Millar & Shevlin, 2003). The TRA is based on the premise that the best predictor of a behaviour is the intention to perform the behaviour (Ajzen & Fishbein, 1980). The TPB, an extension of the theory of reasoned action (TRA) which adds perceived behavioural control to the model, has been used extensively to predict and explain behavioural intentions and actual or self-reported behaviour (Ajzen & Driver, 1992; Hergenrather, Rhodes, & McDaniel, 2005; Higgins & Marcum, 2005; Liaw, 2004).

According to Icek Ajzen (1987), the TPB postulates three conceptually independent determinants of intention to perform a behaviour. The first is the attitude towards the behaviour and refers to an individual disposition, either favorable or unfavorable, toward an object or event (Klobas & Clyde, 2000). As Gibson, Ivancevich, and Donnelly (1994) point out, individual attitude is a positive or negative feeling, or a mental state of readiness, learned, and organized through experience that exerts specific influences on an individual response to people, objects, and situations. The second predictor is a social factor termed subjective norm, which refers to the perceived social pressure to perform or not to perform the behaviour. It could also refer to an individuals' perception that important others (specific referent individuals or groups) would approve or disapprove of his or her performing a given behaviour. The third and novel antecedent of intention, which was not in the reasoned action theory, is an individual's perceived behavioural control. This factor refers to people's perception of the ease or difficulty of performing the behaviour of interest, it is also assumed to reflect past experience as well as resources (e.g., money, time, skills, and cooperation of others) and opportunities. Icek Ajzen (2002) further proposes the two-level hierarchical model, in which perceived behavioural control is the higher-order construct composing of two components: self-efficacy and controllability.

The present study adapted Icek Ajzen's (1991) theory of planned behaviour as key determinants of adult workers' intentions to implement the seven capabilities within the U movement. Respondents were asked to rate their attitude toward the perceived outcomes of implementing the U theory, perceived subjective norms regarding the U implementation, and perceived behavioural control toward performing the U theory.

Methodology

Research structure

Based on reviewed literature, a diagram was outlined to illustrate the methods of, as well as dimensions (i.e., Attitude, Subject norm, Behavioural control, Intention of U practice) and associated factors (i.e., Behavioural belief, Outcome evaluation, Management, Peers, Self efficacy, Controllability, Suspension, Redirection, Letting go. Letting come, Crystallizing, Prototyping, Institutionalizing) in the investigation (see Figure 2).

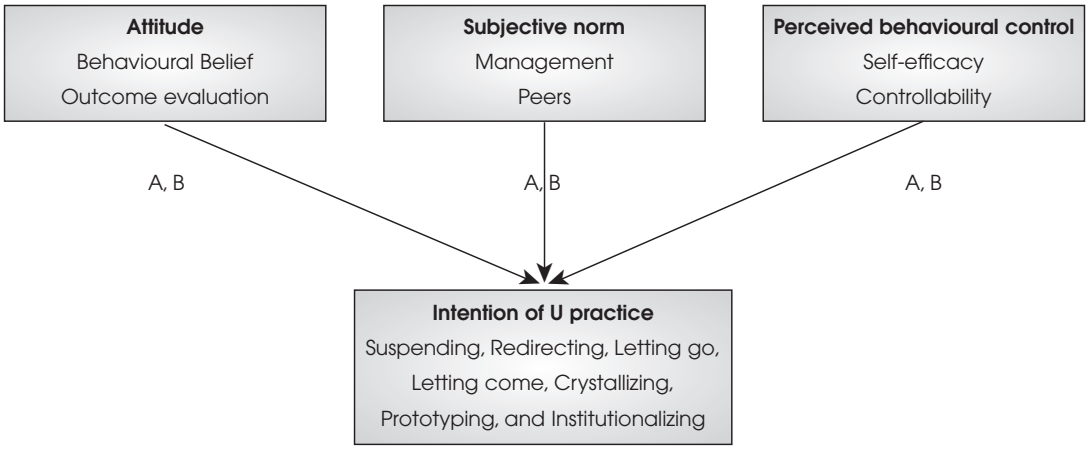

Figure 2: Research structure

The study performed two sets of analyses, shown in Figure 2. Firstly, Pearson correlation analysis (marked "A") was employed to examine the correlation between adult workers' attitude (namely Attitude) and their intention to perform the U theory (namely Intention of U practice), adult workers' perceived subjective norms (namely Subjective norm) and their intention of implementing the U theory (namely Intention of U practice), as well as adults' perceived behavioural control (namely Perceived behavioural control) over performing the U theory and their intention of implementing the U theory (namely Intention of U practice). Secondly, stepwise regression (marked "B") was utilized to determine how adult workers' attitude, perceived subjective norm, and perceived behavioural control toward the

implementation of the U theory affected their intentions to adopt or implement the U theory. The hypotheses are presented below:

> H_1: Adult workers' attitude toward the outcome of implementing the U theory has a positive correlation on their intention to implement the U theory.
>
> H_2: Adult workers' perceived subjective norm on implementing the U theory has a positive correlation on their intention to implement the U theory.
>
> H_3: Adult workers' perceived behavioural control on implementing the U theory has a positive correlation on their intention to implement the U theory.

In the present research, adult workers' personal backgrounds, which consisted of gender, marital status, religious orientation, age, education, length of working experience, education, and length of meditation history, were also assessed to determine how these factors affected their attitude, perceived social pressure, perceived behavioural control as well as their intentions of implementing the U theory. These results can be found in Li-An Ho and Hsun-Fung Kao (2007). This article primarily focuses on reporting the results of the Pearson and stepwise regression analysis.

The dimensions and associated factors in this study were adapted from Icek Ajzen's theory of planned behaviour (1987, 2002) and Peter Senge et al.'s theory of the U (2004a, 2005). The dimensions and associated factors established for analysis are presented below.

The attitude dimension consisted of two factors. They were:

1. Behavioural belief – referred to the extent to which adult workers' beliefs about the likely consequences or other attribute of the behaviour.
2. Outcome evaluation – referred to adult workers' evaluation of these consequences of events or actions.

The subject norm dimension consisted of two factors:

1. Management – referred to the extent to which adult workers perceive supervisors' influences.
2. Peers – referred to the extent to which adult workers perceive peers' influences.

The behavioural control dimension consisted of two factors:

1. Self efficacy – referred to the ease or difficulty of performing a behaviour, or confidence in adult workers' ability to perform it.
2. Controllability – referred to the extent to which adult workers' control over the behaviour, or the beliefs about the extent to which performing the behaviour is up to the actor.

The intention of U practice dimension consisted of seven factors:

1. Suspension – referred to the extent to which adult workers were able to see anew and stop their habitual ways of thinking and perceiving,
2. Redirection – referred to the extent to which adult workers were able to see, thus turning their attention toward the source rather than the object,
3. Letting go – referred to the extent to which adult workers were able to drop their mental models that they accumulated from past experience, and keep themselves open to what was emerging,
4. Letting come – referred to the extent to which adult workers were able to surrender control, surrender into commitment, and start to experience the world as it unfolded to them,
5. Crystallizing – refereed to the extent to which adult workers were able to crystallize their larger intention and imaginatively translate the intuitions that arose into genuine and concrete images and visions that guided action,
6. Prototyping – referred to the extent to which adult workers were able to consciously endeavour to engage in concrete experiments, improvements, and prototyping that were evident and open to the feedback which effort elicited,
7. Institutionalizing – referred to the extent to which adult workers were able to bring into reality enduring changes that were both external (in their associated physically environments) and internal (in their mental cognitions).

Sample

In order to understand the perception of U theory implementation within an organisation, this research targeted a single high-tech manufacturing company in Taipei, Taiwan. TMCorp (a pseudonym) has had years of experiences in organisational learning, and has conducted extensive training for its employees to promote the deeper learning program since February 2005. All departments have been involved in the program. The

respondents consisted of adult workers within TMCorp which were drawn from various departments and all levels of operation. The survey attempted to draw a representative sample from departments. Each department had comparatively different levels of understanding towards the seven capacities of the U movement. TMCorp consisted of a workforce of approximately 1000 members.

Survey instrument

The survey instrument used for this study was developed based on the literature which was presented in the previous section. The items on the survey were also modified to fit the research context and examined by five experts in related areas (i.e., organisational behaviour, human resources management, and adult learning). The total numbers of items for each factors and dimension are presented in Table 1.

Dimension	Number of items per dimension	Factor	Number of items per factor
Attitude	8	Behavioural belief Outcome evaluation	4 4
Subjective norm	8	Management Peers	4 4
Perceived behavioural control	8	Self-efficacy Controllability	4 4
Intention of U practice	27	Suspending Redirecting Letting go Letting come Crystallizing Prototyping Institutionalizing	4 4 4 4 4 4 3

Table 1: Survey structure

A pilot testing was conducted in March 2006. One hundred and sixty-five questionnaires were handed out of which 155 valid results were recovered. After adjustments, a total of 800 questionnaires were distributed in May 2006, from which 653 (81.6%) were recovered. Five hundred and twelve (78.4%) questionnaires were valid for analysis. Respondents were asked to evaluate their attitude, perceived social pressure, perceived behavioural control and intention of implementing the U theory within their departments. Individual items were rated on a Likert scale, which ranged from 5 ("strongly agree") to 1 ("strongly disagree").

Reliability and validity test

Reliability and validity tests were then conducted on the constructs with multivariate measures. Cronbach's α reliability estimate was used to measure the internal consistency of these multivariate scales (Nunnally, 1978). The Cronbach α values of the various dimensions lie between .86 and .95 in the pilot testing (see Table 2) and between .86

and .94 in the formal testing (see Table 3), which revealed good reliability for the survey instrument (Cuieford, 1965). In addition, according to Fred Kerlinger (1999), measures with item-to-total correlations larger than 0.6 are believed to have high criterion validity. Hence, since the item-to-total correlations of all our measures were at least 0.61 for the pilot testing and were at least 0.63 for the formal testing, we concluded that the criterion validity of each scale in this study was satisfactory.

Dimension	M	SD	Cronbach's α	% of variance explained accounted for by dimension
Attitude	3.45	.44	.86	67.92
Subjective norm	3.54	.45	.93	79.76
Behavioural control	3.54	.43	.92	78.93
Intention of U practice	3.48	.56	.95	79.62

Table 2: Internal consistency values for the pilot testing

Dimension	M	SD	Cronbach's α	% of variance explained accounted for by dimension
Attitude	3.44	.42	.87	67.97
Subjective norm	3.53	.43	.92	78.63
Behavioural control	3.51	.42	.92	79.72
Intention of U practice	3.47	.59	.95	77.72

Table 3: Internal consistency values for the formal testing

Results of Statistical Analysis

In the first section of the analysis, correlations were calculated for each of the dimension pairings, i.e. attitude to intention of U practice, subjective norm to intention of U practice, and behavioural control on intention of U practice to intention of U practice, according to the research structure illustrated in Figure 2. Secondly, stepwise regression analysis was used to determine the predictive power of adult workers' attitude, perceived subjective norm, and perceived behavioural control toward their intention of U practice. The following presents the statistical findings of each section, supported by tables.

Results of Pearson correlation

Pearson Analysis was able to identify a statistically significant correlation between all six factors in the attitude, subjective norm and behavioural control dimension and all seven factors in the intention of U practice dimension (Pearson correlation r=.38-.62, p<.001). That is, higher behavioural belief, outcome evaluation, perceived social

pressure from management or peers, self-efficacy and behavioural controllability contributed to higher intention to engage in the U movement. The research hypotheses, H_1, H_2 and H_3, were thus accepted. In other words, there was a significant positive correlation between attitude and intention of U practice, subjective norm and U practice, and behavioural control and U practice dimension (see Table 4).

Dimension/ factors	Attitude		Subjective Norm		Behavioural Control	
Intention of U practice	Behavioural belief	Outcome evaluation	Management	Peers	Self-efficacy	Controllability
Suspending	.38	.45	.46	.42	.53	.47
Redirecting	.38	.43	.39	.40	.45	.40
Letting go	.40	.43	.47	.46	.50	.41
Letting come	.41	.41	.46	.42	.53	.41
Crystallizing	.45	.47	.51	.43	.55	.44
Prototyping	.42	.49	.62	.55	.53	.45
Institutionalizing	.42	.42	.58	.52	.52	.47

Note: All results are significant at p<0.01 (two-tailed)

Table 4: Pearson Correlations between Independent and Dependent Factors of the Study

Stepwise regression between attitude and intention of U practice

We used intention of U practice as the dependent variables (i.e., Y_1, Y_2 ,Y_3, Y_4, Y_5, Y_6, and Y_7 denoting, respectively, "suspending", "redirecting", "letting go", "letting come", "crystallizing", "prototyping", and "institutionalizing") and attitude (X_1 and X_2 denoting "behavioural belief" and "outcome evaluation") as the independent variables in the linear regressions. Analysis was able to identify seven statistically significant correlation equations (p<.001) and their corresponding adjusted R^2 with β (standardized) are showed in Table 5.

$$Y_1 = 0.955 + 0.422\ X_2 + 0.254\ X_1 \quad (1)$$
$$Y_2 = 1.283 + 0.392\ X_2 + 0.255\ X_1 \quad (2)$$
$$Y_3 = 1.269 + 0.403\ X_2 + 0.331\ X_1 \quad (3)$$
$$Y_4 = 0.914 + 0.337\ X_2 + 0.344\ X_1 \quad (4)$$
$$Y_5 = 0.572 + 0.436\ X_2 + 0.383\ X_1 \quad (5)$$
$$Y_6 = 1.395 + 0.373\ X_2 + 0.248\ X_1 \quad (6)$$
$$Y_7 = 1.492 + 0.308\ X_1 + 0.283\ X_2 \quad (7)$$

First, both independent variables of the attitude dimension, namely behaviour belief (X_1) and outcome evaluation (X_2) were able to explain 23.2% of the variance of the dependent variable, namely suspending (Y_1) of the intention of U practice dimension. Among two independent variables, outcome evaluation demonstrated the strongest predictive power (unstandardized coefficient, B=.42) towards adults' intention of practicing the suspending capacity within the U theory (see Table 5).

Criterion	*R*	R^2	Adjusted R^2	Unstandardized Coefficient *B*	Standardized Coefficient β	*t*	*F*
Suspending							
Outcome evaluation	.45	.20	.20	.42	.35	7.46	130.97***
Behaviour belief	.48	.23	.23	.25	.20	4.25	76.72***
Redirecting							
Outcome evaluation	.43	.19	.19	.39	.32	6.91	117.02***
Behaviour belief	.46	.22	.21	.26	.20	4.28	69.63***
Letting go							
Outcome evaluation	.43	.19	.18	.40	.30	6.51	116.20***
Behaviour belief	.47	.23	.22	.33	.24	5.08	73.81***
Letting come							
Outcome evaluation	.41	.17	.17	.34	.27	5.75	102.92***
Behaviour belief	.46	.22	.21	.34	.26	5.55	69.89***
Crystallizing							
Outcome evaluation	.47	.22	.22	.44	.32	7.16	143.89***
Behaviour belief	.52	.27	.27	.38	.27	5.98	94.72***
Prototyping							
Outcome evaluation	.49	.24	.23	.37	.36	8.01	156.44***
Behaviour belief	.52	.27	.27	.25	.23	5.05	94.70***
Institutionalizing							
Behaviour belief	.42	.18	.18	.31	.28	6.00	111.84***
Outcome evaluation	.48	.23	.23	.28	.27	5.82	74.49***

*Note: *p<0.05,**p<0.01,***p<0.001*

Table 5: Correlation between Attitude and Intention of U practice

Secondly, both independent variables of the attitude dimension were able to explain 21.2% of the variance of the dependent variable, namely redirecting (Y_2) of the intention of U practice dimension. Among two independent variables, outcome evaluation demonstrated the strongest predictive power (*B*=.39) towards adults' intention of practicing the redirecting capacity within the U theory.

Third, both independent variables of the attitude dimension were able to explain 22.5% of the variance of the dependent variable, namely letting go (Y_3) of the intention of U practice dimension. Among two independent variables, outcome evaluation demonstrated the strongest predictive power (*B*=.40) towards adults' intention of practicing the letting go capacity within the U theory.

Furthermore, both independent variables of the attitude dimension were able to explain 21.2% of the variance of the dependent variable, namely letting come (Y_4) of the intention of U practice dimension. Among two independent variables, outcome evaluation demonstrated the strongest predictive power (*B*=.34) towards adults' intention of practicing the letting come capacity within the U theory.

Both independent variables of the attitude dimension were able to explain 26.8% of the variance of the dependent variable, namely crystallizing (Y_5) of the intention of U practice dimension. Among two independent variables, outcome evaluation demonstrated the strongest predictive power (*B*=.44) towards adults' intention of practicing the letting come capacity within the U theory.

In addition, both independent variables of the attitude dimension were able to explain 26.8% of the variance of the dependent variable, namely prototyping (Y_6) of the intention of U practice dimension. Among two independent variables, outcome evaluation demonstrated the strongest predictive power (*B*=.37) towards adults' intention of practicing the prototyping capacity within the U theory.

Finally, both independent variables of the attitude dimension were able to explain 23.1% of the variance of the dependent variable, namely institutionalizing (Y_7) of the intention of U practice dimension. Among two independent variables, behaviour belief demonstrated the strongest predictive power (*B*=.31) towards adults' intention of practicing the institutionalizing capacity within the U theory.

Stepwise regression between subjective norm and intention of U practice

We used intention of U practice as the dependent variables (i.e., Y_1, Y_2 ,Y_3, Y_4, Y_5, Y_6, and Y_7) and subjective norm (X_1 and X_2 denoting "management" and "peers") as the independent variables in the linear regressions. Analysis was able to identify seven statistically significant correlation equations (p<.001) and their corresponding adjusted R^2 with β (standardized) are showed in Table 6.

$$Y_1 = 1.121 + 0.377\ X_1 + 0.234\ X_2 \quad (1)$$
$$Y_2 = 1.568 + 0.284\ X_2 + 0.265\ X_1 \quad (2)$$
$$Y_3 = 1.314 + 0.363\ X_1 + 0.337\ X_2 \quad (3)$$
$$Y_4 = 1.028 + 0.388\ X_1 + 0.243\ X_2 \quad (4)$$
$$Y_5 = 0.849 + 0.501\ X_1 + 0.218\ X_2 \quad (5)$$
$$Y_6 = 1.120 + 0.431\ X_1 + 0.252\ X_2 \quad (6)$$
$$Y_7 = 1.192 + 0.408\ X_1 + 0.253\ X_2 \quad (7)$$

First, both independent variables of the subjective norm dimension, namely management (X_1) and peers (X_2) were able to explain 23.6% of the variance of the dependent variable, namely suspending (Y_1) of the intention of U practice dimension. Among two independent variables, management demonstrated the strongest predictive power (*B*=.38) towards adults' intention of practicing the suspending capacity within the U theory (see Table 6).

Secondly, both independent variables of the subjective norm dimension were able to explain 19% of the variance of the dependent variable, namely redirecting (Y_2) of the intention of U practice dimension. Among two independent variables, peers demonstrated the strongest predictive power (*B*=.28) towards adults' intention of practicing the redirecting capacity within the U theory.

In addition, both independent variables of the subjective norm dimension were able to explain 25.7% of the variance of the dependent variable, namely letting go (Y_3) of the intention of U practice dimension. Among two independent variables, management

demonstrated the strongest predictive power (*B*=.36) towards adults' intention of practicing the letting go capacity within the U theory.

Criterion	*R*	R^2	Adjusted R^2	Unstandardized Coefficient *B*	Standardized Coefficient β	*t*	*F*
Suspending							
Management	.46	.21	.21	.38	.33	6.55	138.35***
Peers	.49	.24	.23	.23	.20	3.90	78.71***
Redirecting							
Peers	.40	.16	.16	.28	.24	4.64	95.11***
Management	.44	.19	.19	.27	.24	4.51	59.53***
Letting go							
Management	.47	.22	.22	.36	.30	5.89	141.52***
Peers	.51	.26	.25	.34	.26	5.24	88.18***
Letting come							
Management	.46	.22	.21	.39	.33	6.58	140.29***
Peers	.49	.24	.24	.24	.20	3.95	79.96***
Crystallizing							
Management	.51	.26	.26	.50	.40	8.11	179.78***
Peers	.53	.28	.27	.22	.17	3.39	97.47***
Prototyping							
Management	.62	.38	.38	.43	.45	10.12	309.52***
Peers	.64	.42	.41	.25	.25	5.67	180.30***
Institutionalizing							
Management	.58	.34	.34	.41	.42	9.11	260.46***
Peers	.61	.37	.37	.25	.25	5.42	152.13***

*Note. *p<0.05,**p<0.01,***p<0.001*

Table 6: Correlation between Subjective Norm and Intention of U practice

Both independent variables of the subjective norm dimension were able to explain 23.9% of the variance of the dependent variable, namely letting come (Y_4) of the intention of U practice dimension. Among two independent variables, management demonstrated the strongest predictive power (*B*=.39) towards adults' intention of practicing the letting come capacity within the U theory.

Furthermore, both independent variables of the subjective norm dimension were able to explain 27.7% of the variance of the dependent variable, namely crystallizing (Y_5) of the intention of U practice dimension. Among two independent variables, management demonstrated the strongest predictive power (*B*=.50) towards adults' intention of practicing the crystallizing capacity within the U theory.

Both independent variables of the subjective norm dimension were able to explain 41.5% of the variance of the dependent variable, namely prototyping (Y_6) of the intention of U practice dimension. Among two independent variables, management demonstrated the strongest predictive power (*B*=.43) towards adults' intention of practicing the prototyping capacity within the U theory.

Finally, both independent variables of the subjective norm dimension were able to explain 37.4% of the variance of the dependent variable, namely institutionalizing (Y_7) of the intention of U practice dimension. Among two independent variables, management

demonstrated the strongest predictive power (*B*=.41) towards adults' intention of practicing the institutionalizing capacity within the U theory.

Stepwise regression between behavioural control and intention of U practice

We used intention of U practice as the dependent variables (i.e., Y_1, Y_2 ,Y_3, Y_4, Y_5, Y_6, and Y_7) and behavioural control (X_1 and X_2 denoting "self-efficacy" and "controllability") as the independent variables in the linear regressions. Analysis was able to identify seven statistically significant correlation equations (p<.001) and their corresponding adjusted R^2 with β (standardized) are shown in Table 7.

$$Y_1 = 0.744 + 0.458\ X_1 + 0.267\ X_2 \quad (1)$$
$$Y_2 = 1.360 + 0.374\ X_1 + 0.239\ X_2 \quad (2)$$
$$Y_3 = 1.256 + 0.523\ X_1 + 0.203\ X_2 \quad (3)$$
$$Y_4 = 0.789 + 0.542\ X_1 + 0.166\ X_2 \quad (4)$$
$$Y_5 = 0.570 + 0.584\ X_1 + 0.224\ X_2 \quad (5)$$
$$Y_6 = 1.431 + 0.401\ X_1 + 0.199\ X_2 \quad (6)$$
$$Y_7 = 1.343 + 0.384\ X_1 + 0.239\ X_2 \quad (7)$$

Criterion	*R*	R^2	Adjusted R^2	Unstandardized Coefficient *B*	Standardized Coefficient β	*t*	*F*
Suspending							
Self-efficacy	.53	.28	.27	.46	.39	8.40	194.22***
Controllability	.56	.31	.31	.27	.24	5.12	115.05***
Redirecting							
Self-efficacy	.45	.20	.20	.37	.32	6.55	125.90***
Controllability	.48	.23	.22	.24	.21	4.38	74.78**
Letting go							
Self-efficacy	.50	.25	.25	.52	.41	8.57	172.67***
Controllability	.52	.27	.27	.20	.17	3.49	94.33***
Letting come							
Self-efficacy	.53	.28	.28	.54	.44	9.57	198.41***
Controllability	.54	.29	.29	.17	.14	3.06	105.53***
Crystallizing							
Self-efficacy	.55	.30	.30	.58	.45	9.81	223.17***
Controllability	.57	.33	.32	.22	.18	3.94	112.50***
Prototyping							
Self-efficacy	.52	.27	.27	.40	.40	8.65	192.35***
Controllability	.55	.30	.30	.20	.21	4.50	109.95***
Institutionalizing							
Self-efficacy	.52	.27	.27	.38	.38	8.20	194.41***
Controllability	.56	.31	.31	.24	.25	5.35	115.20***

*Note: *p<0.05,**p<0.01,***p<0.001*

Table 7: Correlation between Behavioural Control and Intention of U practice

Analysis was able to identify seven statistically significant correlation equations (p<.001) between adult workers' perceived behavioural control and their intention of U practice. First, both independent variables of the behavioural control dimension, namely self-efficacy (X_1) and controllability (X_2) were able to explain 31.1% of the variance of the dependent variable, namely suspending (Y_1) of the intention of U practice dimension.

Among two independent variables, self-efficacy demonstrated the strongest predictive power (*B*=.46) towards adults' intention of practicing the suspending capacity within the U theory (see Table 7).

Secondly, both independent variables of the behavioural control dimension were able to explain 22.7% of the variance of the dependent variable, namely redirecting (Y_2) of the intention of U practice dimension. Among two independent variables, self-efficacy demonstrated the strongest predictive power (*B*=.37) towards adults' intention of practicing the redirecting capacity within the U theory.

Thirdly, both independent variables of the behavioural control dimension were able to explain 27% of the variance of the dependent variable, namely letting go (Y_3) of the intention of U practice dimension. Among two independent variables, self-efficacy demonstrated the strongest predictive power (*B*=.41) towards adults' intention of practicing the letting go capacity within the U theory.

In addition, both independent variables of the behavioural control dimension were able to explain 29.3% of the variance of the dependent variable, namely letting come (Y_4) of the intention of U practice dimension. Among two independent variables, self-efficacy demonstrated the strongest predictive power (*B*=.54) towards adults' intention of practicing the letting come capacity within the U theory.

Furthermore, both independent variables of the behavioural control dimension were able to explain 32.5% of the variance of the dependent variable, namely crystallizing (Y_5) of the intention of U practice dimension. Among two independent variables, self-efficacy demonstrated the strongest predictive power (*B*=.58) towards adults' intention of practicing the crystallizing capacity within the U theory.

In addition, both independent variables of the behavioural control dimension were able to explain 30.2% of the variance of the dependent variable, namely prototyping (Y_6) of the intention of U practice dimension. Among two independent variables, self-efficacy demonstrated the strongest predictive power (*B*=.40) towards adults' intention of practicing the prototyping capacity within the U theory.

Finally, both independent variables of the behavioural control dimension were able to explain 31.2% of the variance of the dependent variable, namely institutionalizing (Y_7) of the intention of U practice dimension. Among two independent variables, self-efficacy demonstrated the strongest predictive power (*B*=.38) towards adults' intention of practicing the institutionalizing capacity within the U theory.

Discussion and Conclusion

The study was based in a high tech manufacturing company to understand how adult workers perceived the theory of the U before its actual implementation. The study focused on two issues: the first was whether there was a significant correlation between attitude and intention of U practice, subject norm and intention of U practice, as well as behavioural control and intention of U practice. Secondly, the study examined the predictive power of attitude, perceived subjective norm and behavioural control on adult workers' intention to perform the U theory.

First of all, although the theory of planned behaviour has been used extensively to predict and explain behavioural intentions and actual or self-reported behaviour in different settings (Ajzen & Driver, 1992; Hergenrather et al., 2005; Higgins & Marcum, 2005; Liaw, 2004), the degrees of the predictive power of each of the three components (namely, attitude, subject norm, and behavioural control) vary in different contexts or applications of behaviour predictions (see, for example, Broadhead-Fearn & White, 2006; Buchan, 2005; Bosnjak, Tuten, & Wittmann, 2005; Van Breukelen, Van Der Vlist, & Steensma, 2004). The result of Pearson correlation in this study showed that adult workers' attitude, perceived subject norm and behavioural control had a positive correlation with their intention of deeper learning. The finding appeared to be in line with Icek Ajzen's argument that the more favorable the attitude and subjective norm with respect to a behaviour, and the greater the perceived behavioural control, the stronger should be an individual's intention to perform a behaviour under consideration (1987, 1991).

Secondly, the study discovered twenty-one significant correlation equations (seven for each pairing dimension). The factors within the attitude dimension had slightly higher predictive power toward the crystallizing and prototyping aspects of the intention of U practice dimension (both together are able to explain 26.8% of the variance). Between both factors in the attitude dimension, the outcome evaluation factor presented a much stronger predictive power on the intention of U practice dimension. The finding suggests that adult workers were likely to perceive the outcome, or the values of the implementation as an important indicator that stimulated them to accept or reject an innovation. As stated in the theory of instructional design, one way to motivate and enhance learning is to match instructional objectives to learner needs for greater learning achievement (Keller, 1987; Small, 2000). For corporations that wish to promote deeper learning process, being able to demonstrate the benefits and advantages of implementing the U theory is an essential element for its successful adoption and diffusion.

In addition, the factors within the subjective norm dimension had relatively higher predictive power on the prototyping and institutionalizing aspects of the intention of U

practice dimension (41.5 and 37.4% of the variance respectively). Between the two factors in the subjective norm dimension, the management factor showed a much stronger predictive power on the intention of U practice dimension, which implies that for corporations that plan to adopt the U theory, carefully re-designing their corresponding regulations, policies or reward system to complement the implementation of the U theory is a key to successful adoption of the U theory. Furthermore, based on results of regression analysis, the study also learned that the subjective norm dimension had the strongest predictive power on the intention of U practice dimension. Thus, among three components of behavioural predicting, corporations should emphasize the importance of deigning sound policy and regulations concerning the implementation of the U theory, and constructing social networks to facilitate the deeper learning process. Although other studies argue that as perception of legal sanctions increases, deviating behaviour decreases correspondingly (Efebera, 1999), the present study found that deeper learning was considered legitimate conduct for which a higher perceived social pressure results in greater intention to perform (Ajzen, 1987, 1991).

Finally, the factors within the behavioural control dimension had slightly higher predictive power on the crystallizing, institutionalizing, and suspending aspects of the intention of U practice dimension (32.5%, 31.2% and 31.1% of the variance, respectively). Between both factors in the behavioural control dimension, the self-efficacy factor demonstrated consistently a strong predictor for the intention of U practice dimension. This finding supports a number of existing studies in which learning performance and training effectiveness were affected directly by self-efficacy (Huang & Chiu, 2006; Jackson, 2002; Tai, 2006). In other words, people may dislike those activities that they do not feel they can successfully master (Compeau & Higgins, 1995). Thus, the study suggests the corporations that wish to implement the U theory create supporting systems which foster the implementation of the U theory. Such support systems may include training, learning community, process consultation and information infrastructure that may prevent unnecessary barriers and obstacles during the implementation of the U, thus avoiding injuring the adult workers' confidence of mastering the U theory.

Although the study provides several valuable implications as mentioned above, some limitations were difficult to avoid. First of all, the sample size was limited. This study surveyed only one high-tech manufacturing company, which might result in biased expectations when applying the result to other contexts. Secondly, the research methods focused on quantitative analysis. Due to budget and time constrains, the study failed to confirm the results of the survey through qualitative methods, such as in-depth interviews with adult workers from the sample company. Thus, for future research, it would be beneficial to collect more questionnaires from other organisations or conduct in-depth interviews with the adult workers from different divisions and positions of the same organisation.

References

Ajzen, I. (1987). Attitudes, traits, and actions: Dispositional prediction of behaviour in personally and social psychology. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*. New York: Academic.

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human-Decision Processes*, *50*, 179-211.

Ajzen, I. (2002). Perceived behavioural control, self-efficacy, locus of control, and the theory of planned behaviour. *Journal of Applied Social Psychology*, *32*, 1-20.

Ajzen, I., & Driver, B. L. (1992). Application of the theory of planned behaviour to leisure choice. *Journal of Leisure Research*, *24*(3), 207-224.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting aocial behaviour*. New York: Spring.

Andrykowski, M. A., Beacham, A. O., Schmidt, J. E., & Harper, W. K. (2006). Application of the theory of planned behavior to understand intentions to engage in physical and psychological health behaviour after cancer diagnosis. *Psycho-Oncology*, *15*, 759-77.

Bosnjak, M., Tuten, T. L., & Wittmann, W. W. (2005). Unit (non) response in web-based access panel surveys: An extended planned-behaviour approach. *Psychology & Marketing*, *22*(6), 489–505.

Broadhead-Fearn, D., & White, K. M. (2006). The role of self-efficacy in predicting rule-following behaviors in shelters for homeless youth: A test of the theory of planned behaviour. *The Journal of Social Psychology, 146*(3), 307-325.

Buchan, H. F. (2005). Ethical decision making in the public accounting profession: An extension of Ajzen's theory of planned behaviour. *Journal of Business Ethics, 64*(2), 165-181.

Chen, H-C., Holton III, E. F., & Bates, R. (2005). Development and validation of the learning transfer system inventory in Taiwan. *Human Resource Development Quarterly, 16*(1), 55-84.

Chen, S-H., Yang, C-C., & Shiau, J-Y. (2006). The application of balanced scorecard in the performance evaluation of higher education. *The TQM Magazine, 15*(2), 190-256.

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly, 19*, 189-211.

Cuieford, J. P. (1965). *Fundamental statistics in psychology and education* (4th ed.). New York, NY: McGraw Hill.

Dinev, T., & Hu, Q. (2007). The centrality of awareness in the formation of user behavioral intention toward protective information technologies. *Journal of the Association for Information Systems*, *8*(7), 386-408.

Efebera, H. K. (1999). *Determinants of tax compliance behaviour: An examination of low-income taxpayers' intentions*. Unpublished doctoral dissertation, University of South Florida.

Gibson, J. L., Ivancevich, J. M., & Donnelly, J. H. (1994). *Organizations: behavior, structure, processes*. Boston: Irwin.

Hergenrather, K. C., Rhodes, S. D., & McDaniel, R. S. (2005). Correlates of job placement practice: Public rehabilitation counselors and consumers living with AIDS. *Rehabilitation Counseling Bulletin, 48*(3), 157-167.

Higgins, G. E., & Marcum, C. D. (2005). Can the theory of planned behaviour mediate the effects of low self-control on alcohol use? *College Student Journal*, *39*(1), 90-103.

Ho, L-A., & Kao, H-F. (2007). Are people willing to learn? An application of the theory of planned behaviour on adults' deeper learning. *International Journal of Management in Education*, *1*(4), 298-317.

Huang, H-H., & Chiu, C-K. (2006). Proposing student learning performance in physical education by applying social cognitive theory. *Journal of American of Business, Cambridge*, *9*(2), 280-284.

Jackson, J. (2002). Enhancing self-efficacy in and learning performance. *The Journal of Experimental Education*, 70(3), 243-254.

Ju, T. L., Chen, S-H., Li, C-Y., & Lee, T-S. (2005). A strategic contingency model for technology alliance. *Industrial Management & Data Systems*, *105*(5/6), 623-645.

Keller, J. M. (1987). Strategies for stimulating the motivation to learn. *Performance and Instruction, 26*(8), 1-7.

Kerlinger, F. N. (1999). *Foundations of behavior research* (4th ed.). Fort Worth, TX: A Harcourt College Publishing.

Klobas, J. E., & Clyde, L. A. (2000). Adults learning to use the internet: A longitudinal study of attitudes and other factors associated with intended Internet use. *Library*, *22*, 5-34.

Lee, T-S., & Tsai, H-J. (2005). The effects of business operation mode on market orientation, learning orientation and innovativeness. *Industrial Management & Data Systems, 105*(3/4), 325-348.

Lepre, C. R. (2007). Getting through to them: Reaching students who need career counseling. *The Career Development Quarterly*, *56*(1), 74-85.

Liaw, S-S. (2004). The theory of planned behaviour applied to search engines as a learning tool. *Journal of Computer Assisted Learning, 20*(4), 283-292.

Millar, R., & Shevlin, M. (2003). Predicting career information-seeking behaviour of school pupils using the theory of planned behaviour. *Journal of Vocational Behaviour*, *62*, 26-42.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw Hill.

Pai, J-C. (2006). An empirical study of the relationship between knowledge sharing and IS/IT strategic planning (ISSP). *Management Decision, 44*(1), 105-123.

Ramachander, S. (2005). Shaping the future with insight. *Business Line*, Jan 13, 1.

Rogers, E. (1995). *Diffusion of innovation*. New York, NY: The Free Press.

Senge, P. (1994). *The fifth discipline*. New York, NY: Currency.

Senge, P. M., Scharmer, C. O., Jaworski, J., & Flowers, B. S. (2004a). *Presence: Human purpose and the field of the future*. Cambridge, MA: Society for Organizational Learning.

Senge, P. M., Scharmer, C. O., Jaworski, J., & Flowers, B. S. (2004b). Awakening faith in an alternative future. *Reflections*, *5*(7), 1-11.

Senge, P. M., Scharmer, C. O., Jaworski, J., & Flowers, B. S. (2005). *Presence: An exploration of profound change in people, organization, and society*. New York, NY: Currency.

Shen, B., McCaughtry, N., & Martin, J. (2007). The influence of self-determination in physical education on leisure-time physical activity behavior. *Research Quarterly for Exercise and Sport*, *78*(4), 328-339.

Small, R. (2000). Motivation in instructional design. *Teacher Librarian*, *27*(5), 29-31.

Tai, W-T. (2006). Effect of training framing, general-efficacy and training motivation on trainees' training effectiveness. *Personnel Review*, *35*(1), 51-66.

Tsai, M-T., & Tsai, L-L. (2005). An empirical study of the knowledge transfer methods used by clinical instructors. *International Journal of Management*, *22*(2), 273-284.

Van Breukelen, W., Van Der Vlist, R., & Steensma, H. (2004). Voluntary employee turnover: Combining variables from the "traditional" turnover literature with the theory of planned behaviour. *Journal of Organizational Behaviour*, *25*, 893-914.

Walker, G. J., Jackson, E. L., & Deng, J. (2007). Culture and leisure constraints: A comparison of Canadian and mainland Chinese university students. *Journal of Leisure Research*, *39*(4), 567-591.