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ABSTRACT

Basic ICT and Internet skills are becoming necessary for individuals to have meaningful engagement across various life domains. However, mastering basic ICT skills is not a trivial task especially for those socio-economically disadvantaged. This research develops an integrated self-determination and self-efficacy theories to examine the influence of self-determined motivation on ICT training outcomes and subsequent ICT acceptance with an emphasis on Internet skill development and usage. The context of the study is the Thai community technology centers supported by the Microsoft Unlimited Potential grants. The results suggest that individuals who have higher self-determined motivation to participate in ICT training programs are more likely to develop Internet computer self-efficacy, positive training satisfaction, and strong usage intention. In other words, attitudes towards ICT acceptance are shaped even before individuals enter training programs. Implications for research and practice are discussed.

Keywords: Digital inequality, self-determination, self-efficacy, community technology centers

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1. INTRODUCTION

Information and communications technology (ICT) and Internet skills are becoming necessary for individuals to engage meaningfully across various life domains including education, government, work, politics and social services (Fountain, 2001). However, not everyone possesses the skills to use ICT and the Internet effectively. This is particularly true for the socio-economically disadvantaged. Their lack of these necessary skills inhibits this already disadvantaged group from achieving life success in the knowledge economy.

Mastering basic ICT productivity software and Internet skills is not a trivial task. For example, Internet search and communications skills involve understanding Web graphic conventions, framing appropriate queries, recognizing trustworthy Web sites and using Internet etiquette, among others (van Dijk, 2005; Warschauer, 2004). Developing these skills is challenging for the socio-economically disadvantaged who are less educated and may not have access to computing resources.

Evidence from various surveys conducted with different socio-economically disadvantaged communities suggests several reasons for their lack of Internet use: the belief it will not be useful; lack of appropriate skill set; and lack of motivation to acquire that skill set (Crump and Mcllroy, 2003; NTIA, 2004). For example, the 2004 NTIA survey reported that about 41% of U.S. population does not use the Internet even though close to 25% of those individuals have Internet access at home (NTIA, 2004). Such evidence recognizes the importance of motivation and basic skills as critical requirements towards use. van Dijk (2005) identified computer anxiety and lack of social support as other barriers that prevent individuals from accessing and using ICT

However, very little research has studied how and to what extent motivation and skills relate to use particularly among the socio-economically disadvantaged as evidenced in calls for additional research in this area (e.g., de Haan, 2004; Gurstein, 2003; Nurmela and Viherä, 2004).

The purpose of this study is to develop a better understanding of how skill development programs offered by community technology centers (CTCs) affect ICT acceptance. The major research question is:

> *What is the influence of underlying motivation towards ICT skill training on skill development and usage intention among socio-economically disadvantaged?*

2. COMMUNITY TECHNOLOGY CENTERS (CTCs)

In the past decade, community technology centers (CTC) have emerged as an appealing means to address digital inequality by offering access to computers and the Internet and providing necessary training to socio-economically disadvantaged. Several CTCs are managed as not-for-profit organizations through collaborative efforts with other organizations that can offer specific resources and expertise (e.g., hardware and software vendors, university affiliates, or libraries).

Although CTCs have significant potential to address digital inequality, research has shown that a center's outcomes do not always meet its proposed development goals (Warschauer, 2004). Some researchers (e.g., Schon et al., 1999) are skeptical about the community computing movement. Therefore, there is a need for systematic research to evaluate community technology center initiatives (Hudson, 2001). This research is an attempt to assess the role of CTCs in increasing individuals' knowledge and skills through ICT training and in promoting ICT use after training.

3. THEORETICAL PERSPECTIVES

3.1. Digital Inequality and Social Inclusion

Early digital inequality research focused on inequality in physical "access" to information technology. This emphasis gave rise to initiatives that addressed this inequality—often referred to as "digital divide"-- by providing access to technology (e.g., universal access programs, public

access to computers and the Internet through community technology centers). However, ICT access is simply the first step in addressing the inequality and does not necessarily guarantee technology use. Therefore, recent digital inequality research has shifted the focus to the divide between those who can effectively use ICT and the Internet and those who cannot. Effective use is defined as "the capacity and opportunity to successfully integrate ICTs into the accomplishment of self and collaboratively identified goals" (Gurstein, 2003, p. 10). Such a definition of effective use suggests that ICT skill training and goal oriented motivation are fundamental to an understanding of ICT use among socio-economically disadvantaged.

There is a growing recognition that digital inequality is a multifaceted problem and requires material resources, cognitive resources, and social resources to address the problem effectively (Freese et al., 2006; Jackson et al., 2001; van Dijk and Hacker, 2003). Material resources refer to possessions or having access to computers. Social resources refer to social support that can provide assistance in managing material resources. In their large scale study of older adults, Freese et al. (2006), for example, found that, in addition to the influence of material and social resources, cognitive ability positively influence the extent of Internet use and usage behavior for both men and women, even when socio-economic factors such as education and income are taken into account. Their results suggest that cognitive resources or ability to use the Internet is important in understanding why some individuals use the Internet.

However, there are at least two limitations with previous studies that examine the influence of material resources, cognitive resources, and social resources. First, most studies focused on a descriptive analysis of use and nonuse. Second, there is no theoretical support on variables investigated in some studies (van Dijk and Hacker, 2003). To answer the calls for more theory-based research to understand digital inequality (DiMaggio et al., 2001; van Dijk and Hacker,

2003) , we integrate the psychological theories of self-determination and self-efficacy to identify important motivational, affective, and cognitive factors that contribute to ICT use behavior.

3.2. The Self-Determination Theory

Research on ICT acceptance indicates that psychological factors shape motivations, perceptions, and attitudes towards technology and usage behavior, all of which, in turn, predict usage intention and usage among various user groups (e.g., Karahanna et al., 1999; Taylor and Todd, 1995; Venkatesh et al., 2003) including the socio-economically disadvantaged (Hsieh et al., 2008). Evidence from ICT training research suggests that perceptions towards ICT use are significantly shaped by training particularly for those who are in the early stages of use (Venkatesh and Davis, 1996). Despite the early evidence from ICT acceptance research that intrinsic and extrinsic motivation are important drivers of behavioral intention (Davis et al., 1992), motivation to receive training, its antecedents, and consequences towards sustained usage behavior are under theorized (Venkatesh, 1999).

Self-determination theory (SDT) is a psychological theory that aims at explaining psychological factors that promote well-being and development across various life activities (Deci and Ryan, 1985; Ryan and Deci, 2000). SDT strongly emphasizes the influence of self-motivation on the behavioral regulation process which, in turn, affects behavioral outcomes. Since motivation is one of the important factors to understand ICT usage behavior, SDT is an appropriate theoretical foundation for this research.

SDT identifies three essential psychological needs that, when satisfied, will facilitate an individual's constructive personal growth and social development. These needs are (1) the needs for competence, (2) the needs for autonomy, and (3) the needs for relatedness. The need for competence refers to people's inherent desire to be effective in dealing with the environment (White, 1959). The need for autonomy refers to people's urge to be causal agents, to experience

volition, and to act in accord with their integrated sense of self (i.e., with their interests and values) (de Charms, 1968). The need for relatedness refers to the propensity to interact with, be connected to, and experience caring for other people (Baumeister and Leary, 1995).

SDT postulates that there are relationships among motivation, behaviors, and behavior outcomes. Typically, motivation is classified into two main classes: intrinsic and extrinsic. Intrinsic motivation refers to the drive to perform a behavior based on the enjoyment and satisfaction of a specific activity while extrinsic motivation refers to the drive to perform a behavior to attain specific outcomes (e.g., goals or rewards). Prior psychological research suggests that intrinsic motivation relates to self-determined behavior which in turn enhances performance and leads to continuance of behavior. Several studies in the health care domain found that intrinsic motivation associates with positive health behaviors such as better adherence to taking medications among patients with chronic illnesses (Williams et al., 1998), long-term control of weight loss among obese patients (Williams et al., 1996), and higher involvement in an addiction treatment program (Ryan et al., 1995). Similarly, studies in ICT acceptance found that intrinsic motivation increased behavioral intention to use a technology (Venkatesh, 1999).

Self-determination theory extends the extrinsic motivation concept by relating it to the extent to which the behavioral regulation process is autonomous. Autonomous behavior, in contrast to controlled behavior, has an internal perceived locus of causality and is associated with a sense of choice, volition, and freedom. There are four types of extrinsically motivated behaviors that can be ranked from the least autonomous to the most autonomous: externally regulated behavior, introjected regulated behavior, identified regulated behavior, and integrated regulated behavior. Table 1 lists different types of motivation and their associated behavioral regulation process.

Table 1. Motivation Types and Behavioral Regulation Processes (Ordered from high to low self-determined behavior)		
Motivation	**Definition**	**Behavioral Regulation Process**
Intrinsic motivation	The drive to perform a behavior is based on the enjoyment and satisfaction of a specific activity Highly autonomous behavior	
Extrinsic motivation	The drive to perform a behavior to attain specific outcomes (e.g., goals or rewards)	
• External regulation	A behavior is performed to satisfy an external demand, pressure, or reward	Controlled behavior (Low autonomous behavior)
• Introjected regulation	A behavior is performed to avoid guilt, anxiety, or to enhance self-esteem	Controlled behavior (Moderately low autonomous behavior)
• Identified regulation	A behavior is accepted as personally important	Moderate autonomous behavior
• Integrated regulation	An behavior is internally integrated into congruence with an individuals' values and needs	Moderately high autonomous behavior

3.3. The Self-Efficacy Theory

Self-efficacy theory, derived from social cognitive theory (Bandura, 1986), has received considerable empirical support for its explanation of individual behavior across life domains. Self-efficacy refers to an individual's belief in his or her ability to successfully perform a specific behavior. IS research has demonstrated the significant role of self-efficacy in ICT skill training (e.g., Compeau and Higgins, 1995b; Johnson and Marakas, 2000; Olfman and Mandviwalla, 1994) and ICT acceptance (Lewis et al., 2003; Venkatesh, 2000; Venkatesh et al., 2003). (For a review of self-efficacy research in IS, see Marakas et al., 1998). More specifically, studies have shown that ICT skill training increases self-efficacy which in turn influences ICT acceptance. This evidence suggests that incorporating self-efficacy in our research should improve an understanding of the flow of behaviors from decisions to receive training to ICT skill development and subsequent ICT acceptance.

Early research defined computer self-efficacy construct as “an individual judgment of one’s capability to use a computer” (Compeau and Higgins, 1995a, p. 192) and used this definition to investigate a decision to use computers and computer skills acquisition (Marakas et al., 1998). Some studies reported the importance of computer self-efficacy on performance and ICT acceptance, (e.g., Venkatesh and Davis, 2000; Venkatesh et al., 2003). Yet, other studies demonstrated contradictory findings. Bolt et al. (2001), for example, reported no significant link between computer self-efficacy and performance. In another study, Gallivan et al. (2005) found that computer self-efficacy was not related to usage behavior.

Marakas et al. (1998, 2007) suggested that such mixed results were attributable to the lack of appropriate theorizing of the self-efficacy construct. The early conceptualization of computer self-efficacy as general efficacy perceptions towards computers appears to be too simplistic and fails to capture the dynamic, multileveled, and multifaceted nature of the construct. Consequently, Marakas et al. (1998) proposed that computer self-efficacy operates at two interrelated levels: the general computing behavior level and the specific computer task or application level. General computer self efficacy refers to “an individual’s judgment of efficacy across multiple computer domains” (p. 129) while application-specific self-efficacy refers to “an individual’s perception of efficacy in performing specific computer-related tasks within the domain of general computing” (p. 128). The new conceptualization of the self-efficacy construct supports the use of application-specific computer self-efficacy to understand individual behavior in specific applications or tasks (e.g., Word Processing, Excel, and the Internet). Moreover, there is empirical evidence to support that application-specific computer self-efficacy has stronger explanatory and predictive power than the

general construct (Johnson and Marakas, 2000; Marakas et al., 2007). Consistent with the recent theorizing of computer self-efficacy, this research will use application-specific computer self-efficacy (i.e., the Internet) to investigate related antecedence and behavioral consequence of Internet computer self-efficacy to better understand ICT skill training and acceptance.

4. THEORETICAL MODEL AND HYPOTHESES

Our theoretical model integrates the self-determination theory (Deci and Ryan, 1985) and the self-efficacy theory (Bandura, 1986; Marakas et al., 1998) to examine the role of motivation that shape Internet self-efficacy and affect factors which in turn shape behavioral intention for future Internet use. The proposed research model is shown in Figure 1.

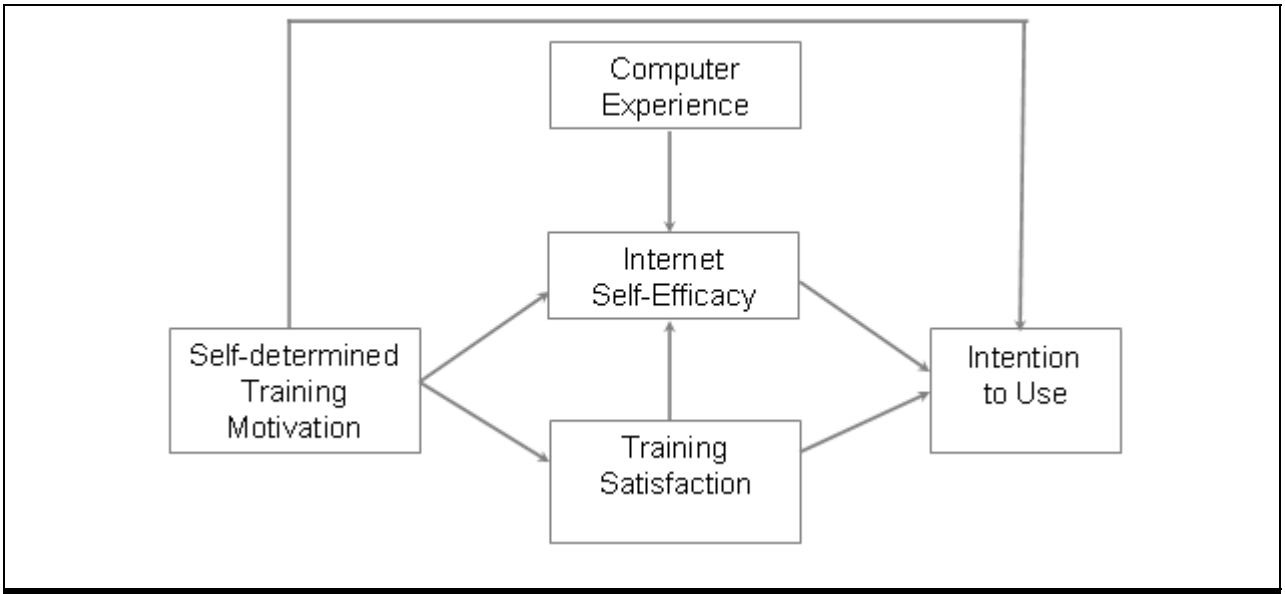

Figure 1. The Integrated Self-Determination and Self-Efficacy Model of ICT Training and Use

The dependent variable is intention to use. Behavioral intention has been found to predict actual behavior in online marketplaces (Pavlou and Gefen, 2005), Internet usage (Hsieh et al., 2008), and organizational IS usage (Venkatesh et al., 2003). Behavioral intention is a strong predictor of actual behavior when the behavior is volitional and an individual has information to develop well-formed behavioral intention (Ajzen, 1991; Karahanna et al., 1999). In this study,

individuals' decisions to use the Internet after training are voluntary and the direct experience with the Internet during training allows individuals to form stable behavioral intention for future use. Therefore, behavioral intention is an appropriate dependent variable in this study.

Next, we develop the hypotheses that relate various determinants to the behavioral intention to use the Internet.

ICT skill training research together with ICT acceptance research indicate that motivation is an important determinant in linking positive training experiences to ICT acceptance (Alavi and Leidner, 2001; Davis et al., 1992; Piccoli et al,, 2001; Venkatesh, 1999; Webster and Martocchio, 1992). Self-determined motivation leads to positive affective, cognitive, and behavioral consequences such as higher task concentration (Kowal and Fortier, 1999), sustained engagement and persistence in the activity (Lavigne et al., 2007), higher level of enjoyment (Simons et al., 2003), and better performance (Gagne et al., 2003; Simons et al., 2003).

In the context of Internet training for the socio-economically disadvantaged, the theoretical argument and empirical evidence discussed above suggests that self-determined motivation relates to positive cognitive outcome (i.e., Internet self-efficacy), affective outcome (i.e., training satisfaction), and behavioral intention. This leads to the following hypotheses:

H1a: Self-determined motivation will be positively related to Internet computer self-efficacy

H1b: Self-determined motivation will be positively related to training satisfaction

H1c: Self-determined motivation will be positively related to intention to use the Internet

Empirical evidence from digital inequality studies has shown self-efficacy to be strongly related to ICT usage behavior. Self-efficacy has been suggested as a key driver for ICT acceptance (Compeau and Higgins, 1995b; Venkatesh and Davis, 2000). Jackson et al. (2001), for example, found that confidence in computer skills was among the strongest predictors of

Internet use. In another study, Eastin and LaRose (2000) found that Internet self-efficacy strongly relates to Internet use, suggesting that efficacy specific to the Internet is important to understand Internet-usage behaviors (Marakas et al., 1998).

The above theoretical and empirical evidence leads to the following hypothesis:

H2: Internet computer self-efficacy will be positively related to intention to use the Internet

Satisfaction has been widely used as a measure to evaluate the effectiveness of IT skill training (Piccoli et al., 2001). Self-efficacy, among several training outcomes variables, is shaped by the learning climate in which ICT skills are developed. ICT skill training research has evaluated different training methods and their differences in enhancing individual computer self-efficacy (e.g., Gist et al., 1989; Piccoli et al., 2001; Simon et al., 1996; Venkatesh, 1999). Venkatesh (1999), for example, found that users who have more enjoyable training experience are more likely to use the system. This leads to the following hypotheses:

H3a: Training satisfaction will be positively related to Internet computer self-efficacy

H3b: Training satisfaction will be positively related to intention to use the Internet

Previous experience has been found to be an important determinant of self-efficacy (Compeau and Higgins, 1995b; Johnson and Marakas, 2000; Wood and Bandura, 1989). In particular, prior experience has been shown to shape computer self-efficacy belief in the early stages of learning and usage. Research reported that both general computer experience (Durndell and Haag, 2002) and prior Internet experience (Eastin and Larose, 2000; Hargittai, 2004) shape individuals' Internet self-efficacy. In their study of the psychological factors concerning digital inequality, Eastin and Larose (2000) found that prior Internet experience was the strongest predictor of Internet self-efficacy. Individuals may need at least two years of experience to be competent with their Internet skills. This leads to the following hypothesis:

H4: Computer experience will be positively related to Internet self-efficacy

5. RESEARCH METHOD

5.1. Microsoft Unlimited Potential Community Technology Centers, Thailand

It is widely recognized that access to and use of ICT provide opportunities to learn, connect, and ultimately, improve individuals' lives. However, the estimated five billion people, mostly the socio-economically disadvantaged, are deprived of such life opportunities due to the lack of ICT access and effective use.

In 2003, Microsoft launched the Microsoft Unlimited Potential program to support community technology centers. The program was expanded in 2007 as part of long-term global efforts to provide social and economic opportunities for individuals who have yet to realize the benefits of ICT. Each year, the program awards grants to non-governmental organizations worldwide to set up CTCs to provide training opportunities and ICT access for the socio-economically disadvantaged. Typically, a grant includes cash to set up CTCs, Microsoft software (e.g., Word, Excel, PowerPoint, Internet Explorer), and specialized curriculum to support ICT skills training. Since 2003, the program has provided more than $US315 million in cash and software grants to support 37,000 CTCs in more than 100 countries worldwide.

Four NGOs in Thailand have received the Microsoft Unlimited Potential grants and they have set up twenty CTCs in ten provinces including Bangkok, the country's capital city. These CTCs target different disadvantaged communities including impoverished communities, rural communities, and suburban workforce who lack access to ICT training programs. Each CTC offers ICT skill training programs and serves as an access point for those who do not have computers at home. The CTCs provide a unique opportunity to assess the efficacy of CTCs in realizing their goals in empowering individuals through ICT. Our research interest is to study the

relationship between motivation to receive training and training outcomes as well as ICT acceptance.

5.2. Instrument Development

There are five key constructs in the theoretical model: (1) self-determined training motivation, (2) computer experience, (3) Internet self-efficacy, (4) training satisfaction, and (5) Internet usage intention. The instrument primarily used validated measures from prior research. Self-determined training motivation which assesses an individual's motivation towards training was measured using items adapted from Vallerand et al. (1992, 1993) to fit the Internet skill training research context. The original scale was developed to assess students' motivation towards formal educational activities and consists of seven subscales, each of which uses four items to measure different motivation types. Three subscales measure intrinsic motivation to know (e.g., "For the pleasure I experience when I discover new things"), to accomplish things (e.g., "For the pleasure I experience while surpassing myself in learning"), and to experience stimulation (e.g., "For the high feeling that I experience while learning topics of my interest"). Three subscales measure three types of extrinsic motivation: external regulation (e.g., "Because I want to have a good life in the future"), introjected regulation (e.g., "Because I want to show myself that I can learn computer programs"), and identified regulation (e.g., "Because it will help me to enter the job market in the field that I like"). The last subscale measures amotivation (e.g., "I don't have good reasons and I feel that I am wasting my time in this training").

Consistent with prior ICT acceptance research (e.g., Venkatesh and Morris, 2000), computer experience was measured by asking respondents to report the number of years that they have used computers. Training satisfaction was measured using three items that Piccoli et al. (2001) modified from Green and Taber (1980) to assess respondents' satisfaction with the training process. Intention to use was measured by three items that have been widely used in the ICT

acceptance research (e.g., Karahanna et al., 1999; Taylor and Todd, 1995; Venkatesh and Davis, 2000).

Self-efficacy, as discussed earlier, was measured by the application-specific self-efficacy (Internet self-efficacy) scale adapted from Marakas et al. (2007). Consistent with Marakas (1998, 2007), we view Internet self-efficacy as a formative construct because the indicators may measure different Internet skill beliefs and do not necessarily have to covary, be correlated, or interchangeable.

5.3. Data Collection

In summer 2008, a field study was conducted to collect data from individuals who received Internet skill training from seven CTCs under the management of three NGOs in Thailand. The seven CTCs are located in Bangkok, Buriram, and Pang-Nga provinces. The survey instrument was pretested with Microsoft's Thailand community affairs manager who oversees all CTCs under the Microsoft Unlimited Potential program and with one of the NGO administrative staff who himself was an instructor and has since worked closely with CTC instructors on training programs and other services. Modifications (e.g., wording changes) of the survey instrument were made according to the feedback from the two content experts prior to the data collection.

The questionnaires were collected by CTC staff or instructors and returned to the researchers via postal mail. Prior to questionnaire distribution, face-to-face meetings or telephone conversations were established with CTC personnel to explain the study's purpose and data collection instruction. Some respondents filled in the survey questionnaires in their last Internet skill training sessions while others responded to the survey within one month of their Internet training.

In all, 204 individuals responded to the survey. After excluding cases with missing data or incomplete responses, 187 surveys were retained for data analysis. Descriptive statistics are shown in Table 2.

Table 2. Descriptive Statistics of Respondents		
	Number of respondents	Percent
Gender		
Male	51	29.7%
Female	121	70.3%
Age group		
10 – 15	45	26.2%
16 – 19	19	11.0%
20 – 29	70	40.7%
30 – 39	25	14.5%
40 – 49	11	6.4%
> 50	2	1.2%
Education level		
Some elementary school	37	22.2%
Some high school	28	16.8%
Finishing high school	79	47.3%
Vocational degree	11	6.6%
College degree	11	6.6%
Graduate degree	1	0.6%
Monthly income		
< 2,000 Baht	42	28.2%
2,001 – 6,000 Baht	53	35.6%
6,001 – 10,000 Baht	45	30.2%
10,000 – 20,000 Baht	6	4.0%
> 20,000 Baht	3	2.0%
Computer experience		
None	59	35.5%
Some experience (average = 3 years)	107	64.5%

6. DATA ANALYSIS AND RESULTS

6.1. Measurement Model Validation

Partial Least Square (PLS) was used to evaluate the influence of self-determined motivation on training outcomes and Internet usage intention. PLS allows us to simultaneously examine the measurement model and the structural model (Gefen et al., 2000) and is appropriate for this research for at least two reasons. First, PLS employs a component-based approach and can

handle both formative (Internet self-efficacy) and reflective constructs (self-determined training motivation, training satisfaction, and intention to use) (Gefen et al., 2000). Second, PLS has a minimal restriction on the sample size and residual distributions (Chin et al., 2003).

The data collected from several CTCs were pooled together for the analysis because the results from different samples were not significantly different. The F-statistic from Chow test was 1.42 (*p-value = 0.22*). Thus, the results reported are based on the analysis of the pooled data from all CTCs.

Internet self-efficacy is a formative construct, suggesting that each indicator uniquely contributes to the construct and is not interchangeable (Jarvis et al., 2003). Therefore, it is not appropriate to use the conventional construct validity assessment that relies on common factor analysis to validate this construct. Bollen and Lennox (1991) and Diamantopoulos and Siguaw (2006) recommended that construct validity and reliability of formative constructs should be assessed by examining item weights and evaluating multicollinearity respectively. All item weights are significant and no evidence of multicollinearity was present since the variance inflation factor was 2.18, well below the suggested cutoff of 3.3. Therefore, construct validity is established for Internet self-efficacy. Appendix A shows the means, standard deviations, and construct validity and reliability of the Internet self-efficacy construct.

The convergent validity and reliability of the reflective constructs (self-determined training motivation, training satisfaction, and intention to use) were evaluated by examining item loadings and composite reliability. The self-determined training motivation construct was measured by 28 items that evaluate the extent of individuals' self-determined motivation associated with their Internet training participation. Following prior studies (e.g., Grolnick and Ryan, 1987; Vallerand and Bissonnette, 1992), we calculated four subscales by assigning higher

weights to items that have high degree of self-determination and internal regulation. The subscales and associated weights ordering by the degree of self-determination are intrinsic motivation (weight = 2), identified regulation (weight = 1), introjected regulation (weight = -1), and external regulation (weight = -2). Self-determined motivation subscales have been shown to have good construct validity and predictive power (Connell and Ryan, 1984, Vallerand and Bissonnette, 1992; Vallerand et al., 1997).

The assessment of the convergent validity and reliability of the three reflective constructs are considered acceptable because all items are significant at $p < 0.01$ level and the composite reliability are high, ranging from 0.88 (training satisfaction) to 0.90 (self-determined training motivation). Appendix B shows the convergent validity of the reflective constructs.

The discriminant validity of all constructs was evaluated by examining the loadings and cross-loadings of item-construct loadings, and average variance extracted (AVE). Discriminant validity is established when items load higher on their hypothesized construct than on other constructs and when the square root of a construct's AVE is larger than its correlations with other constructs (Gefen and Straub, 2005). As shown in Appendix C1 and C2, all items load higher on their constructs than on other constructs and the square root of each construct's AVEs is higher than its correlations with other constructs.

Data collection from self-report surveys is susceptible to common-method bias and can threaten the validity of the study (Podsakoff et al., 2003). Common method bias relates to common method variance which refers to the spurious covariance shared among variables by the common method used in data collection (Buckley et al., 1990). Harman's single-factor test using exploratory factor analysis is one of the recommended methods to assess common method bias. Common method bias exists if a single factor is identified from the unrotated factor solution and

when the first factor explains the majority of the variance in the variables (Malhotra et al., 2006; Podsakoff et al., 2003). In our unrotated factor analysis results, the first factor accounted for 27.3% of the variance and the ten factors together accounted for 68.6% of the variance. Therefore, we conclude that common method bias is not a concern for this study.

6.2. Structural Model Testing

We tested the structural model by performing a bootstrap analysis with 500 subsamples in PLS Graph 3.0 to estimate the path coefficients and their significance. Figure 2 presents the path coefficients and the explained variances.

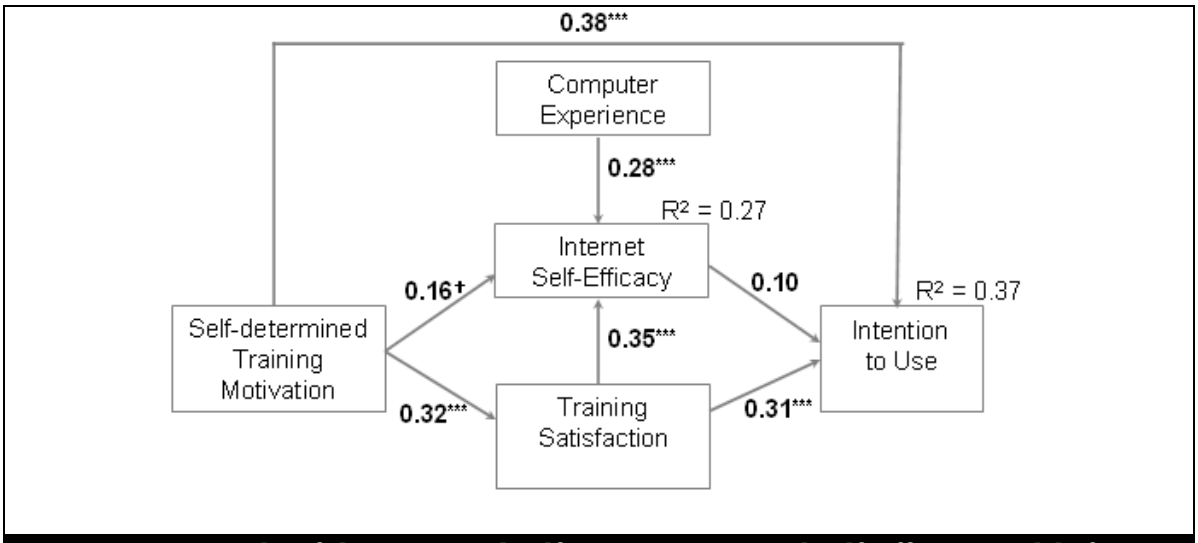

Figure 2. PLS Results of the Integrated Self-Determination and Self-Efficacy Model of ICT Training and Use
The significance levels are: † p < .10, * p < .05, ** p < .10, *** p< .005.

The results support all the hypothesis except H2 -- Internet self-efficacy will be positively related to intention to use the Internet. Self-determined training motivation is positively related to Internet self-efficacy ($\beta = 0.16, p < .10$), training satisfaction ($\beta = 0.32, p < .005$), and Internet usage intention ($\beta = 0.38, p < .005$), supporting H1a to H1c. Training satisfaction is positively related to Internet self-efficacy ($\beta = 0.35, p < .005$), and Internet usage intention ($\beta = 0.31, p < .005$), supporting H3a and H3b. Prior computer experience is positively related to Internet self-

efficacy ($\beta = 0.28$, $p < .005$), supporting H4. Overall, Internet self-efficacy is predicted by self-determined training motivation and training satisfaction ($R^2 = 0.27$). Self-determined training motivation, Internet self-efficacy, and training satisfaction are significant predictors of Internet usage intention ($R^2 = 0.37$).

7. DISCUSSION AND CONCLUSION

7.1. Key Findings

This study examines the self-determined motivation towards ICT skills training and its consequences on affective and cognitive outcomes which in turn shape usage intention. The research results suggest that the self-determined training motivation construct is an important factor that can significantly improve an understanding of outcomes of ICT skill training and ICT acceptance. In particular, individuals who have higher self-determined motivation to participate in ICT training programs are more likely to develop Internet self-efficacy, training satisfaction, and subsequent usage intention.

7.2. Limitations

There are a few limitations in this study. The first limitation is related to potential recall bias for some of the individuals who did not respond to the survey questionnaires immediately after their last Internet training session. Empirical evidence has shown differences in the quality of responses as recorded in retrospective surveys (Mathiowetz, 1999). Generally, recall ability deteriorates with time, leading to higher reporting errors. However, recall bias is more problematic in studies that require respondents to provide fine-grained details associated with events such as dates, frequency, and duration of events (Tourangeau et al., 2000). Our survey questionnaire did not ask questions related to specific details of the Internet skill training sessions. Instead, the questions largely ask individuals about their motivation, attitudes, and behavioral intention, recall bias is not a serious concern in this study. The second limitation is

related to the causal relationships suggested in the theoretical model. The results reported are derived from cross-sectional data. A longitudinal research examining individual's pre- and post-training behavior could provide richer insights into behavioral patterns and the dynamic of important factors.

7.3. Implications for Research

This research has implications for digital inequality, ICT skill training, and ICT acceptance research. Digital inequality scholars (e.g., Odasz, 1994; Patterson, 1997) call for systematic research to evaluate the impacts of community technology projects. In addition, IS research calls for further research to establish a link between ICT skill training and ICT acceptance research streams by evaluating the role of ICT skill training on performance and subsequent ICT use decisions (Johnson and Marakas, 2000). This study addresses these calls and offers empirical evidence to suggest that attitudes towards ICT acceptance are shaped even before individuals enter training programs. ICT skill training research primarily investigates training methods and identified various ways to enhance motivation during training sessions (e.g., Piccoli et al., 2001; Simon et al., 1996). These studies assume that trainees are equally motivated to participate in training and that using motivation-enhanced training methods should lead to positive training outcomes. However, our research results offer evidence to suggest that such assumptions are too naïve and may explain mixed results in ICT skill training studies and decline in learning and training dropout in training programs (Olfman and Mandviwalla, 1994).

7.4. Implications for Practice

Corea (2000) argued for a need for a better solution to address digital inequality by fostering the "long-term nurturing of behaviors intrinsically motivated to engage with such

technologies." Our results offer some guidance for CTCs to improve positive outcomes of ICT skill training programs. In particular, it is important to understand individuals' self-determined motivation to receive training and to cultivate that motivation by meeting the basic underlying psychological needs for autonomy, competence, and relatedness. For example, giving trainees choices in their learning process supports autonomy and may contribute to positive training outcomes.

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Appendix A. Formative Construct Validity and Reliability

Construct	Item	Mean	Std. Dev.	Weight	t-stat
Internet computer self-efficacy (Net_eff)	Net_eff1	64.00	29.17	0.26	10.05***
	Net_eff2	68.10	27.22	0.24	8.16***
	Net_eff3	62.68	29.10	0.27	10.38***
	Net_eff4	54.56	28.38	0.18	4.53***
	Net_eff5	75.09	26.38	0.26	8.26***

Note: The significance levels are: * p < .10, ** p < .05, *** p< .01

Appendix B. Reflective Construct Convergent Validity

Construct	Item	Mean	Std. Dev.	Loading	t-stat
Self-determined motivation (Self-motiv)	IM	49.55	5.29	0.90	56.74***
	IDENT_REG	24.67	3.06	0.88	35.42***
	INTRO_REG	-23.57	3.05	-0.78	19.29***
	EX_REG	-45.82	7.17	-0.76	12.43***
Satisfaction (Satis)	Satis1	6.02	1.11	0.87	36.68***
	Satis2	5.80	1.13	0.80	14.40***
	Satis3	5.88	1.09	0.86	28.74***
Intention to use (Intent)	Intent1	6.18	1.12	0.84	20.55***
	Intent2	6.08	1.03	0.89	40.63***
	Intent3	6.39	0.88	0.82	24.66***

Note: The significance levels are: * p < .10, ** p < .05, *** p< .01

Appendix C. Construct Discriminant Validity

C1. **Correlations among Latent Constructs and AVE (shown in diagonal)**				
	Self_motiv	Satis	Net_eff	Intent
Self_motiv	**0.70**			
Satis	0.32	**0.71**		
Net_eff	0.26	0.41	n/a	
Intent	0.51	0.47	0.33	**0.72**

C2. Item-Construct Loadings and Cross Loadings				
	Self_motiv	Satis	Net_eff	Intent
IM	**0.90**	0.35	0.22	0.52
IDENT_REG	**0.88**	0.26	0.23	0.50
INTRO_REG	**-0.78**	-0.28	-0.24	-0.32
EX_REG	**-0.76**	-0.15	-0.17	-0.30
Satis1	0.25	**0.87**	0.46	0.46
Satis2	0.26	**0.81**	0.26	0.34
Satis3	0.31	**0.86**	0.28	0.38
Net_eff1	0.19	0.37	**0.89**	0.30
Net_eff2	0.30	0.31	**0.76**	0.26
Net_eff3	0.19	0.34	**0.89**	0.28
Net_eff4	0.15	0.34	**0.73**	0.19
Net_eff5	0.30	0.35	**0.83**	0.29
Intent1	0.41	0.34	0.34	**0.84**
Intent2	0.42	0.38	0.31	**0.89**
Intent3	0.47	0.47	0.20	**0.82**