AN EXPLORATORY STUDY OF SELF-DIRECTED LEARNING: THE DIFFERENCES BETWEEN IT AND NON-IT EMPLOYEES IN THAILAND

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ABSTRACT

In the world of technology, people become highly familiar and proficient in a range of technological applications and media. While using technology, people can gain learning opportunities due to people consider that they can learn by themselves. This leads to the concept of self-directed learning. Self-directed learning styles are related to Internet and social media nowadays, so people can learn easily and comfortably. Self-directed learning in the workplace has highly implemented since employees who are a large group of people tend to search and find information they want from IT sources to support their works. Computer literacy becomes an important skill and knowledge for working efficiency and self-directed learning. It was clearly seen that technology become a pivotal tool for people who want to learn by themselves. Investigating the difference of IT and Non-IT employees in terms of learning styles will possibly provide better insight of self-directed learning concept. Consequently, this study aims to explore the dimensions of self-directed learning among Thai employees. In addition, the difference between IT and Non-IT workers was examined. This study employed survey method, collecting data from questionnaires. The results revealed that there were five dimensions of self-directed learning:

1. *Learning with intention.*
2. *Open-mindedness.*
3. *Characteristics of self-discipline.*
4. *Characteristics of self-management.*
5. *Desire to learn. Additionally, IT and Non-IT employees were different in dimension 1 (Learning with Intention).*

The results from this study can apply for organization to train and support employees to learn as they want.

INTRODUCTION

While our world is changing and jumping into the world of technology, people can prioritize up their learning using self-directed way and adopting self-directed learning to help them become life-long learners. Self-directed learning takes an important role nowadays since people can learn lots of things by themselves from different sources, especially through the Internet and social media (Blaschke, 2014). There are some examples such as some people learn English by themselves via YouTube or Facebook, or others can learn computer through video

clips in the Internet. From these examples, people have accessed the content for learning, or getting their knowledge from information technology. These learning channels can also influence the ways of life and decision making (Siriwongs, 2015). Since people learn something more from their own experiences independently, self-directed learning is mainly related with Internet and technology, investigating the dimensions of self-directed learning will shed light of the preferable ways and styles of their self-directed learning. The results can help organization to provide the suitable training facilities and environment for their employees. To gain more benefits for organizations, the difference of self-directed learning between IT and Non-IT employees was examined.

Therefore, this study aims to explore the dimensions of self-directed learning of Thai employees and examining whether IT and Non-IT employees have different dimensions of self-directed learning or not.

Research Questions

The research questions of this study were:

1. What are the dimensions of self-directed learning among Thai employees?

2. Does the difference exist in self-directed learning between IT and Non-IT employees?

Hypothesis

H1: IT and Non-IT employees are significantly different in self-directed learning styles.

Key Terms Definition

Generally, IT employees are responsible for developing information system, while Non-IT employees are users for those systems. To provide definitions for this study in detail, IT and Non-IT employees were described below.

1. IT employees are referred to employees working in listed companies in The Securities Exchange of Thailand (SET) and graduated in Information Technology (IT) field such as Computer Science, Computer Engineering, Information Technology, Information System and Software Engineering.

2. Non-IT employees can be defined as employees working in listed companies in The Securities Exchange of Thailand (SET). They did not graduate in Information Technology (IT) field and did not work in IT field.

SELF-DIRECTED LEARNING THEORY

Concepts of Self-Directed Learning

The concept of Self-Directed Learning (SDL) was initially viewed as a characteristic of adult education. It was first discussed in educational literature as early as 1926. As Lindemann and Knowles stated, self-directed learning is *"the art and science of helping adults learn"* (Merriam, 2001). The source of motivation of adults to learn was stemmed from their experiences and the opportunity to choose the own way to learn (Carson, 2012). Later, there were many scholars attempted to define what SDL is.

The perspectives of SDL have been emerged in various ways depending on the frame of concepts of scholars. Oddi (1987) mentioned that the most of researchers view self-directedness as a process of learning, while a smaller group of researchers views self-directed learning from a

psychological point of view (Carson, 2012). Ones who view SDL as a process possibly defined SDL on the part of adult education. The self-directed learning for this case means the process of knowledge transmission (Carson, 2012). SDL have been viewed as a skill that engaged by individuals. It could be improved though experience or training by instructors. Many researchers agreed that learners should be guided to increase their ability to have more self-directedness and responsibility for their own learning (Merriam, 2001). On the other point of views, scholars, viewing SDL in dimension of psychology, defined SDL as a characteristic of personality. This has led researchers to study the relationship between SDL and other variables. The self-directed learning has allowed individual high in self-efficacy and intrinsically motivated. Learners can also check their learning needs, set individual goals, choose appropriate method to achieve those goals, evaluate themselves, and are not afraid of facing new challenges.

In addition to these two concepts, some researchers stated that SDL is an important component emancipating for workplace learning, especially for adults who want to be higher in socio-economic ladder, to increase political awareness, and to promote social action (Ellinger, 2004). Thus, SDL is an important function of human resource development process. The researchers for this concept possibly tended to focus on designing of environment for promoting adults to be more self-directed or more critical for failure to provide environment for emancipatory learning.

Although there are many concepts or definitions of SDL, the most commonly used definition is Knowles (1989). For Knowles, SDL is viewed as a process of study which *"the students take initiate with or without the help of others, assess their learning needs, formulate goals with implementation of appropriate strategies and evaluate learning outcome".* It also requires students to improve themselves (Knowles, 1989).

According to learning theory of Merriam et al. (2012), learning can be categorized into five approaches: behaviorist, cognitivist, humanist, constructivist, and social learning. Among five approaches, there are two approaches related to self-directed learning: cognitivist and constructivist (Merriam et al., 2012). Based on cognitivist approach, there are four essential abilities of learners including self-awareness, self-monitoring, critical and creative thinking, and improving learning styles. In aspect of constructivism approach, one of important characteristics of adult learners is self-directed learning. Based on some previous scientific research, the major characteristics which is appropriate to self-directed learners are independent person, ability to apply knowledge in their real life, being responsible for their learning quality and experience (Vaivada, 2012). Wu (2004) proposed that one of characteristics of a lifelong learner is conducting self-directed learning (Wu, 2004). It can be said that people who performed themselves as self-directed learners can be lifelong learners. Lifelong learners are knowledgeable people with deep understanding. They love to try any learning opportunities and to be able to employ learning strategies and skills, to be able to make future plan, and to have ability and skills for solving problem. It is clear that self-directed learning can lead to lifelong learning which is one of important characteristics required by every country (Chiang, 1998) Because self-directed learners are able to use various learning method and strategies, Information and Communication Technology or ICT is a main tool for their learning (Department of Economic and Social Affairs, 2003).

Self-directed learning and ICT utilization is related in many ways, especially in education. ICT is widely used in learning contexts (Prestridge, 2012). Almost every part of our culture including educational context was entwined with technology (Mareco, 2017). The adoption of ICT in learning was beneficial since technology has enabled learners to access the

out-of-class information and this has caused the increase of their motivations to learn (Hamidi et al., 2011). This can be implied that the use of technology can increase the motivation of students to learn, and can support lifelong, self-directed learning beyond the regular classes (Saxena, 2013). In this century, the use of technology in education becomes a significant factor to achieve in effective learning. The students were initially taught in class, and then provided activity via on-line learning and remote training. The students were given freedom to learn by themselves and brought out their intelligence (Asfar & Zainuddin, 2015). This helps them to make their own knowledge and experience a sense of independence while learning. Apart from that, most students have started doing collaborative learning using various technology devices to promote self-directed learning ability. When the students learned from personal learning networks such as blogs, Twitter or Facebook, they may have collaboration among learners in the same channels. Video conferencing is a preferable tools help turning classrooms into global communication centers for free. Students can connect with anyone around the world and discuss topics they are interested in with other experts and scholars (Saxena, 2013). The adults can also be autonomous to learn when they need to be free to direct themselves (Abdullah et al., 2008). It can be said that self-directed learning is not only suitable for the students, but also for adults. During the last three decades, self-directed learning has become a major research area (Hiemstra, 1994). However, there are only a few research topics about self-directed learners towards ICT concepts. Dawson et al. (2012) investigated the relationship between using technology and self-directed learning (Dawson et al., 2012). The result of the study indicated that adoption of technology can promote and foster SDL skills: motivation, self-management and self-monitoring. In addition, using technology encouraged learning analytics for learners to evaluate their progress, and allow instructors to monitor the development of SDL skills. This can also be supported by the study of Rashid & Asghar (2016) which aimed to inspect a path model with technology use and self-directed learning among university students (Rashid & Asghar, 2016). The results showed that use of technology has a direct positive relationship with students' self-directed learning. In addition, the findings of path analysis demonstrated that technology use can predict self-directed learning and help to improve students' learning. The students who had high frequency of technology usage, especially social media tended to use more time to learn directly. It was found that when students learned directly through computer and technology, they tended to be more successful in learning (Bawaneh, 2011). The relationship between technology usage and academic performance can be supported by the study of (Eyyam & Yaratan, 2014). The study revealed that the mathematics posttest scores of the students who were instructed using technology were significantly higher than the posttest scores of the those who were instructed without technology (Eyyam & Yaratan, 2014). The results also showed that learning through technology seemed to be a preferable choice for the students.

Self-directed learning is somewhat related with adult learning theory on both theoretical and practical grounds. This paper intended to provide an important concept of adult learning because the population in this study, employees, are in adult age. Since adult learner are more responsible for their life, they are freely choosing the way they learn by themselves. In addition, adults have been taught from their schools or university courses, and this can lead them to know how they can learn by themselves. Presently, adults are ready to learn those things they need to know in order to manage their life effectively. So, for productive learning, adults know the right time to learn and what value to them (Litster, 2016). The adult learner is one who returns to study, on a full-time or part-time basis, after a period of time spent in other pursuits (Manning, 2007). Likewise, Freedman states that the adult learner is one who tends to be motivated to take

further education at the end of a working day or required to attend a program for certification (Freedman, 1985).

Modern adult learning theory has found on assumptions that adults needs to be self-directed learners. They are motivated to learn because they found from their experiences and interests that learning is interesting and important for them. In addition, it is assumed that adults' learning orientation is self-centred. Hence, adult learning, based on this concept, is mainly related to self-directed learning. It is also clear that learning should be largely based on individuals' experiences and focused on life situations and life goals.

According to Knowles's theory of adult education, adult learners are more successful when they are highly motivated, when they can participate in learning process, and when learning content had practical implications. Knowles also asserted that adults prefer informal settings as conduciveness to learn. In addition, they need opportunities to practice their new skills and immediate feedback on their learning process. Therefore, the education of adult learners is something more than the transmission of knowledge; it is a process which people can direct and manage their own learning. In addition to Knowles, Tough (1971) who was a scholar doing adults' learning project found that adults seemed to highly achieve in their learning when the amounts of assistance decrease. Thus, providing only a little help will be one of effective way for improving adults' learning (Tough, 1971).

Online Learning

In this era, online learning has come to be a popular way for working people (Norman, 2016). Since there are several problems for traditional learning, online learning has become popular among people who want to learn by themselves. One problem of traditional learning is the cost. If online learning has not grown in our society, learners would pay much money for the courses they want to attend. Paying for courses would make learners more difficult to learn because they possibly had problem with tuition fee. In addition, learners cannot choose their available time to learn in traditional learning. Learning process would depends on instructors, places, and number of attendants. Yet, online learning can help learners to save budget and choose their preferable time by themselves. Online learning seems to be the greatest revolution in contemporary education (Norman, 2016). It made a considerable change and opened valuable opportunities for everyone who wants to learn something new. Only have the Internet, people can learn everything that they want. It is clear to say that online learning is a sign showing that technology is possibly important for learning. Since technology was widely accessed, online learning has increased from a limited option available for a few adults; it becomes an active and growing commercial industry available to anyone with a good online connection (Carson, 2012).

Since the rapid growth of technology enhanced online learning, new tools for learning have emerged (Tlili et al., 2016). One of these tools is computer-based learning. Computer-based learning or CBL is the term used for any kind of learning with the help of computers. CBL is the use of computers for learning activities which has many benefits, including the advantage of users learning at their own pace and also learning without the need for an instructor to be physically present. Computers can be used to solve the problem of the insufficiency of traditional learning for educating individuals or helping learners gain the required learning skills (Tareef, 2014). In CBL, the learners can get interactive, motivating or immersive teaching methods. CBL also helps learners to have more decision-making, problem solving, data-processing and communication capabilities skills (Bakaç et al., 2011). As a result, learners become motivated, active and had positive attitudes (Tlili et al., 2016). While the adoption of CBL tended to

increase, several weaknesses should be concerned. According to Iowa State University (2011), technical difficulties such as slow Internet connection or older computers can affect the learning process negatively (Tlili et al., 2016). In addition, the learning content for learners in CBL is provided in different forms such as drawings, graphics, animation, music and video. Learners who are not familiar with computers may found themselves in a dilemma. It is noted that characteristics of IT and Non-IT employees seemed to be different in some aspect. For instance, software engineers displayed very high growth needs and were concerned about learning new technology (Beecham et al., 2008).

Self-Directed Learning in Thailand

In Thailand, the studies of self-directed learning were mainly focused on nursing education (Arpanantikul et al., 2006; Klunklin et al., 2010; Preeyavongsakul, 2004; Tuanma, 1996) and college or undergraduate students teaching (Prabjandee & Inthachot, 2013; Siriwongs, 2015; Sombat et al., 2014; Sriarunrasmee et al., 2015; Suknaisith, 2014). For nursing education, self-directed learning is viewed as a method of teaching and learning which increasingly used in nursing education. For instance, the readiness of nursing students in Chiang Mai University was investigated and revealed that the overall self-directed learning readiness of nursing students was at a high level in the dimensions of openness to learning opportunities, self-concept as an effective learner, initiative and independence in learning, informed acceptance of responsibility for one's own learning, creativity, and the ability to use basic study and problem-solving skills (Klunklin et al., 2010).

In addition to readiness of nursing students, there were considerable studies focusing on self-directed learning in teaching process for university students. It was found that learners were satisfied with the instruction using the self-directed learning technique at a high level (Suknaisith, 2014) and they seemed to have positive attitudes towards integration of self-directed learning into the class (Sombat et al., 2014). The results from previous studies provide encouragement to teaching and learning area. It can be used to further apply self-directed learning into courses, to improve teaching and learning methods, and promote life-long learning for Thai students within Thailand.

The studies of self-directed learning in business area have been scarce. Employees who work in business sector and have position to do the job completely and effectively tended to do their jobs with computer, this means, they were familiar with technology. They tended to use technology to improve the processes of work with effectiveness and become tech-savvy. Thus, they are provided to learn directly by themselves. Thus, this study needs to investigate the dimensions of self-directed learning of Thai employees. In order to gain insight knowledge, this study also aims to explore the difference of self-directed learning between IT and Non-IT employees.

RESEARCH METHODOLOGY

Population and Sampling

This study employed a survey method. The target population was the employees working in listed companies in The Securities Exchange of Thailand (SET). Since SET consists of many considerable companies in Thailand, it cannot be denied that SET is an important organization to make economic growth. Furthermore, SET strongly achieves for sustainable economic growth

and social well-being. By focusing on both sustainable economic development and on all stakeholders' sustainability, SET attempts to provide more opportunities and knowledge for investors, partners, alliances, or communities and whole society. Importantly, in order to develop business growth, SET has continued to develop expertise and skills among capital market professionals. For collecting data from the questionnaires, this study was employed purposive sampling method to select SET listed companies from seven industry groups of SET (Agro and Food Industry, Resources, Technology, Financials, Services, Consumer Products, and Property and Construction). The selected companies were considered as leading companies of self-directing learning and seemed to promote self-directedness among employees. In order to gain employees from various listed company and getting good representatives for this study, the researcher assigned employees who are as centers of each company to select respondents. For this step, convenience sampling method was used to survey employees working in the selected companies until the sample size was reached. After getting responses from the centers, collected data were considered a good representative because the responses were from seven industry groups almost equally. It was suggested that sample size for conducting factor analysis should be at least 100 (MacCallum & Widaman, 1999). When numbers of participants increase, sample factor analysis solutions were more stable and accurate. The sample size of this study was shown in Table 1. The respondents were 261 employees which were categorized into two groups: IT and Non-IT employees.

Table 1 NUMBERS OF RESPONDENTS DIVIDED BY MAJORS		
Major	N	Percent
IT	130	49.80
Non-IT	131	50.20
Total	261	100.00

There were 130 IT employees which accounted for 49.80%, and 131 Non-IT employees which accounted for 50.20%. The percentage of respondents showed that numbers of IT and Non-IT employees were quite equal, so it was appropriate to find differences of self-directed learning styles between them.

Instrumentation

The questionnaires consisted of two parts. The first part contained demographic data questions. The other part was used to investigate the dimensions of self-directed learning containing the self-directed learning readiness scale questions, adapted from Fisher (Fisher et al., 2001) (Fisher & King, 2010). Self-directed learning readiness can be defined as *'the degree the individual possesses the attitudes, abilities and personality characteristics'* to learn (Fisher & King, 2010). Self-directed learner may take control and have freedom to learn what they want and what they viewed as important for themselves (Fisher & King, 2010). SDL readiness was necessary and probably offers the best opportunity for learning (Guglielmino, 1977; Wiley, 1983). So, self-directed learning readiness scale questions were appropriately used for investigating self-directed learning. The Self-Directed Learning Readiness Scale of Fisher et al. (2001 & 2010) was comprised of clear, distinctive and understandable items. It is a well-designed, precise questionnaire with useful item and seems to match the purpose of the study. In addition, this questionnaire was tested and used to measure self-directed learning in adult students (Williams & Brown, 2013). Yet, some items in Self-Directed Learning Readiness Scale

of Fisher et al. (2001 & 2010) were related to students' learning in classroom, so they were not suitable in this context. Then, the unrelated items were eliminated. This means that the items used to evaluate self-directed learning scale in classroom were deleted since this study was conducted among employees, not students. The items of this questionnaire were translated into Thai language by experts, and then it was back-translated in order to ensure that English and Thai language in the questionnaire were parallel.

Moreover, the questionnaire items were piloted among 30 employees to find the reliability by using Cronbach's alpha and the 30 employees were excluded in the study. The reliability of the questionnaire was 0.966 which was acceptable since it has indicated that 0.7 is an acceptable reliability coefficient (Nunnally, 1978). In addition, the items were sent to five raters in order to evaluate validity by using Index of Consistency Values (IOC). The IOC values of all question items were more than 0.6. Yet, some items were suggested to edit in terms of ambiguous words.

RESULTS

Dimensions of Self-Directed Learning

To answer research questions 1, the results were analyzed by a factor analysis technique. To assess whether the set of items in the correlation matrix was suitable for principal components analysis, the Kaiser-Meyer Olkin (KMO) measure of sampling adequacy was computed. If the KMO statistic yields high values above 0.70, then correlations among items are sufficiently high to make factor analysis suitable (de Vaus, 2002). For this study, the KMO computed was 0.943. In order to investigate the dimension of self-directed learning, the 52 questionnaire items were analyzed by using Principal Component Analysis (PCA) with Varimax Rotation to extract dimensions. To determine the number of dimensions, three criteria were used: Eigenvalues, scree plot and interpretability of the dimension meaning. According to determination based on Eigenvalues, only dimensions with Eigenvalues greater than 1.0 were retained (Field, 2017; Rietveld & van Hout, 2011). After factor extraction, it might be difficult to interpret and label the factors from the factor loadings. In the principal component analysis, the first factor accounted for the most part of the whole variance, so most items of self-directed learning loaded on this factor. Because of this, Varimax rotation was used to ensure that most variables have high loadings on the most important factors and small loadings on all other factors. According to eigenvalues, there were five dimensions greater than 1.0.

Table 2 EIGENVALUES OF FACTOR ANALYSIS					
Total Variance Explained					
Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	Cumulative %	Cumulative %	Total	% of Variance	Cumulative %
1	20.059	38.575	38.575	6.479	12.460	12.460
2	2.798	5.381	43.956	5.786	11.126	23.586
3	1.965	3.780	47.736	5.781	11.118	34.704
4	1.854	3.565	51.301	5.308	10.208	44.912
5	1.617	3.110	54.411	4.940	9.499	54.411
6	1.380	2.654	57.066			
Extraction Method: Principal Component Analysis.						

The results in Table 2 show that there are five dimensions extracted from the questionnaire. The first dimension accounted for 38.58%, the second dimension accounted for

5.38%, the third dimension accounted for 3.78%, the fourth dimension accounted for 3.57%, and the last dimension accounted for 3.11% of the variance. Thus, these dimensions accounted for 54.41% of the whole variance.

Then, the scree plot was used to determine the best number of dimensions and keep factors that occur before it was flatten. The table and the scree plot show that the first factor accounts for the largest proportion of variance. Besides, the scree plot gradually flattens from the fifth dimension.

For interpretations of factor loadings, the criterion of 0.40 or above was employed. Thus, there were five dimensions to label.

	Table 3 DIMENSIONS OF SELF-DIRECTED LEARNING				
Factor and Items	Dimension 1: Learning with intention	Dimension 2: Open-mindedness	Dimension 3: Characteristics of self-discipline	Dimension 4: Characteristics of self-management	Dimension 5: Desire to learn
I like to make decisions by myself	0.716				
I need minimal help to find information	0.668				
I need to be in control of what I learn	0.631				
I prefer to set my own goals	0.593				
I have high personal standards	0.586				
I prefer to set my own criteria on which to evaluate my performance	0.576				
I am confident in my ability to search out information	0.55				
I am responsible for my own decisions/actions	0.53				
I am in control of my life	0.512				
I have high personal expectations	0.493				
I can find out information by myself	0.493				
I set specific times for my study	0.47				
I am assertive	0.461				
I am aware of my own limitations	0.443				
I evaluate my own performance	0.438				
I am open to new ideas		0.772			
I am open to new learning opportunities		0.736			
I am willing to accept advice from others		0.733			
I learn from my mistakes		0.722			

I will alter my practices when presented with the facts	0.677			
When facing with a problem, I cannot solve, I will ask for assistance	0.627			
I will ask for help in my learning when necessary	0.563			
I prefer to plan my own learning		0.732		
I prefer to set my own learning goals		0.679		
I learn by myself systematically		0.63		
I prefer to direct my own learning		0.607		
I critically evaluate new ideas		0.591		
I often review the way working practices are conducted		0.523		
I like to evaluate what I do		0.497		
I like to solve (answer) puzzles/questions		0.494		
I am able to focus on a problem		0.447		
I set strict time frames		0.439		
I am willing to change my ideas		0.418		
I manage my time well			0.649	
I have good management skills			0.607	
I am methodical			0.599	
I am organized			0.584	
I am self-disciplined			0.518	
I prioritize my work			0.511	
I am a responsible person			0.497	
I have high beliefs in my abilities			0.491	
I am logical			0.489	
I plan when solving problems			0.443	
I like to gather the facts before I make a decision			0.434	
I enjoy learning about new information				0.747
I want to learn about new information				0.73
I enjoy studying				0.71
I enjoy a challenge				0.693
I have a need to learn				0.688

As we have seen from Table 3, it was found that there were five dimensions of self-directed learning among Thai employees. They include

1. Learning with intention.

2. Open-mindedness.

3. Characteristics of self-discipline.

4. Characteristics of self-management.

5. Desire to learn.

Dimension 1: Learning with Intention

There were seven important loading features in this factor. They were all positive loadings. This factor contained item from question 49 (I like to make decisions by myself), 48 *(I need minimal help to find information)*, 52 *(I need to be in control of what I learn)*, 50 *(I prefer to set my own goals)*, 27 *(I have high personal standards)*, 44 *(I prefer to set my own criteria on which to evaluate my performance)*, 31 *(I am confident in my ability to search out information)*, 45 *(I am responsible for my own decisions/actions)*, 51 *(I am in control of my life)*, 26 *(I have high personal expectations)*, 47 *(I can find out information by myself)*, 37 *(I set specific times for my study)*, 30 *(I am assertive)*, 29 *(I am aware of my own limitations)*, and 43 *(I evaluate my own performance)*. Question item 49 contained the highest loading in this factor (0.716). All of these important loading variables can be implied that employees intend to learn by themselves by setting their own goal and trying to reach that goal. They can control themselves and are comfortable to search information they want. Thus, this dimension was labelled as Learning with Intention.

Dimension 2: Open-mindedness

There were seven important loading features in this factor. They were all positive loadings. This factor contained item from question 22 *(I am open to new ideas)*, 21 *(I am open to new learning opportunities)*, 18 *(I am willing to accept advice from others)*, 19 *(I learn from my mistakes)*, 20 *(I will alter my practices when presented with the facts)*, 23 *(When facing with a problem I cannot solve, I will ask for assistance)*, and 17 *(I will ask for help in my learning when necessary)*. Question item 22 contained the highest loading in this factor (0.772). All important loading variables related to openness to learning new things, so this dimension was named as Open-mindedness.

Dimension 3: Characteristics of Self-discipline

There were eight important loading features in this factor. They were all positive loadings. This factor contained item from question 7 *(I prefer to plan my own learning)*, 15 *(I prefer to set my own learning goals)*, 10 *(I learn by myself systematically)*, 8 *(I prefer to direct my own learning)*, 14 *(I critically evaluate new ideas)*, 12 *(I often review the way working practices are conducted)*, 25 *(I like to evaluate what I do)*, 3 *(I like to solve (answer) puzzles/questions)*, 11 *(I am able to focus on a problem)*, 6 *(I set strict time frames)*, and 16 *(I am willing to change my ideas)*. Question item 7 contained the highest loading in this factor (0.732). The majority of these important loading variables related to learning with responsibility and orderly. Thus, this dimension was defined as Characteristics of self-discipline.

Dimension 4: Characteristics of Self-management

There were four important loading features in this factor. They were all positive loadings. This dimension contained question 4 *(I manage my time well)*, 5 *(I have good management skills)*, 42 *(I am methodical)*, 40 *(I am organized)*, 38 *(I am self-disciplined)*, 2 *(I prioritize my work)*, 24 *(I am a responsible person)*, 28 *(I have high beliefs in my abilities)*, 41 *(I am logical)*, 1 *(I plan when solving problems)*, and 39 *(I like to gather the facts before I make a decision)*. Question item 4 contained the highest loading in this factor (0.649). All important loading features related to good management skills, so this dimension was labelled as Characteristics of self-management.

Dimension 5: Desire to Learn

There were four important loading features in this factor. They were all positive loadings. This factor contained item from 36 *(I enjoy learning about new information)*, 35 *(I want to learn about new information)*, 32 *(I enjoy studying)*, 34 *(I enjoy a challenge)*, and 33 *(I have a need to learn)*. Question item 36 contained the highest loading in this factor (0.747). The majority of these important loading variables showed that employees are enjoyable and happy to learn. Thus, this dimension was named as Desire to learn.

The Difference of Self-Directed Learning between IT and Non-IT employees

To answer research 2 and prove hypothesis, independent sample t-test was employed. The results are shown in Table 4

Table 4
INDEPENDENT SAMPLE T-TEST OF SELF-DIRECTED LEARNING BETWEEN IT AND NON-IT EMPLOYEES

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Learning with intention	Equal variances assumed	2.19	266.00	0.03	0.26	0.12	0.03	0.50
Open-mindedness	Equal variances not assumed	-1.51	262.29	0.13	-0.19	0.12	-0.43	0.06
Characteristics of self-discipline	Equal variances assumed	-0.39	266.00	0.70	-0.05	0.12	-0.29	0.19
Characteristics of self-management	Equal variances assumed	-0.55	266.00	0.58	-0.07	0.12	-0.31	0.17
Desire to learn	Equal variances assumed	0.62	266.00	0.54	0.07	0.12	-0.16	0.31

The independent t-test was run to compare factor scores of IT and Non-IT employees on dimensions of self-directed learning. According to Levene's test of equality of variances, F-test showed that *p* value for Open-mindedness was 0.03 which was less than 0.05, so the equal variances not assumed was selected to present. On the other hand, F-test showed that p values for another four dimensions (Learning with Intention, Characteristics of self-discipline,

Characteristics of self-management, and Desire to learn) were greater than 0.05, so the equal variances assumed was considered to present. As Table 4 shows, the significant of dimension 1(Learning with intension) was 0.03 which was less than 0.05. The significant values for dimensions 2-5 were greater than 0.05. It can be concluded that there was a significant difference of Learning with intention between IT and Non-IT employees. Therefore, *H0* was accepted, this means, IT and Non-IT employees were significantly different in self-directed learning styles.

Table 5 MEAN AND STANDARD DEVIATION				
Factors	**IT**		**Non-IT**	
	Mean	**SD**	**Mean**	**SD**
Learning with intention	3.93	0.49	3.96	0.48
Open-mindedness	4.37	0.46	4.34	0.52
Characteristics of self-discipline	3.98	0.47	3.90	0.51
Characteristics of self-management	4.07	0.44	4.00	0.51
Desire to learn	4.25	0.60	4.24	0.60

In order to understand insight details of differences, descriptive statistics was used to examine whether IT or Non-IT employees are better in Learning with intention. As Table 5 shows, mean score of Dimension 1 (Learning with intention) of IT employees is 3.93, while mean score of Non-IT employees is 3.96. Thus, the score of Non-IT employees in Dimension 1(Learning with intention) was more than the score of IT employees. This means that Non-IT employees tend to learn with intention more than IT employees.

DISCUSSION AND CONCLUSION

According to the results, Thai employees working in the listed companies of SET prefer to learn directly by themselves in five different dimensions. The five dimensions included Learning with intention; Open-mindedness; Characteristics of self-discipline; Characteristics of self-management; and Desire to learn. It can be implied that Thai employees have positive attitude towards self-directed learning since they intend to learn, and they are broad-minded to learn from new things and other people. In addition, Thai employees are characterized as good self-discipline and management to learn by themselves. As Freedman stated, the adult learners are motivated enough to want further education at the end of working day (Manning, 2007). Thai employees nowadays tend to learn directly by themselves because of some reasons. Some of them learn because they want to know something, while others may learn because they want to be higher in their working positions (Ellinger, 2004). This means that motivation is one of a pivotal factor affecting self-directed learning. As indicating in the study of Heo and Han (2018), motivation seemed to be a significant predictor and had influence on self-directed learning readiness among online students (Heo & Han, 2018). Therefore, employees who was motivated to learn new things or get better in their works seemed to be characterized as self-directed learners. In addition, it was also found that one of prominent factors motivating computing students to learn on their own was projected-related tasks (Mccartney et al., 2016). IT employees who was regularly provided to complete numerous project tasks might be motivated to readily learn on their own. Nevertheless, it is the fact that lifelong learners have a previous experience in on-campus taught courses before they start to learn by themselves. They were taught from their schools or university courses, and this can lead them know how they can learn by themselves. Learners possibly have been instructed, and then they can continue to find more information or learn with the help of computers. If they were not guided to learn, it would be difficult for them to learn with self-directedness. Therefore, most of employees who had previous experiences to

learn in courses may perceive that self-directed learning was important. They probably learn by themselves easily and have positive attitudes towards self-directedness. In addition, employees working in the listed companies of SET may employ self-directed learning strategies and skills to make future plan or solve problem for their works. Therefore, they tended to learn with self-directedness frequently. Compared to previous studies in Thailand (Sombat et al., 2014; Sriarunrasmee et al., 2015; Suknaisith, 2014). Thai employees and students tended to have same styles of self-directed learning. They have positive attitudes towards self-directed learning; and see that self-directedness is important (Sombat et al., 2014). Yet, Thai students were high in learning with creativeness, while it was not found among Thai employees. This is probably because students are younger than employees. They are in generation of designing new things, so they learn creatively. On the other hand, employees are well skilled. They are surrounded by rules, regulations and laws. They have encountered rejections and failure, so they have to only finish work on time. Creativeness may not be needed during their working. Because of these, learning with creativeness have not found in adult-learning research. Other than this point, it was revealed that learning with self-discipline and self-management were found in this study, but rarely found in the study of self-directed learning among students (Klunklin et al., 2010). Since the students are younger, they possibly have less skills on management and responsibility. Thus, organizations should concern with the styles of self-directed learning and support employees to learn by themselves in order to improve working ability and skills.

Among five dimensions, there were only one dimensions which IT and Non-IT employees were different: which is learning with intention. This means that IT workers were lower in setting their own goals and criteria to evaluate themselves than Non-It employees. This can be understandable since IT workers have studied and work with technology more than Non-IT workers. As mentioned above, previous experiences in taught courses may affect employees' learning styles. IT employees graduated in IT field or regularly encountered with IT experiences. They worked with the most of typical IT tasks, and they can learn from computers quickly. They seemed to be familiar with technology and learn through technology normally. Because of this, IT employees are also confident with their ability to learn and learn unintentionally. Their learning through technology seems to be common activity for them. They may not need to set their own goals to learn and set their criteria to measure what they have learn because they were proficient in learning from computer and technology. In addition, they do not need help to find information. So, there was a significant difference in Learning with intention styles between IT and Non-IT employees. This means that Non-IT employees learn more intentionally than IT employees.

In conclusion, this study was conducted to investigate self-directed learning styles of adult learners and find differences between IT and Non-IT employees. The results showed that there were five dimensions of self-directed learning styles including Learning with intention; Open-mindedness; Characteristics of self-discipline; Characteristics of self-management; and Desire to learn. Since educational background and previous experience seemed to influence on their learning, IT and Non-IT workers were different in one aspect: learning with intention. The limitations of this study were categorized into two points. Firstly, there was a lack of demographic information on participants in terms of fields they graduated and frequency of computer and technology access. The participants were required to indicate they worked or graduated in IT or Non-IT fields. Unfortunately, dimensions of self-directed learning styles among various fields of the participants could not revealed in this study. Obtaining this information in future research may be important. In addition, the use of technology and mobile

device might be related with the characteristics of self-directedness. It was supported by the study of Rashid and Asghar (2016) which showed that the use of technology had a direct positive relationship with students' engagement and self-directed learning (Rashid & Asghar, 2016). In addition, average time spent with technology and mobile device use may influence on self-directed learning score (Bartholomew et al., 2017). Therefore, investigating the dimensions of self-directed learning among employees spending different average time with technology and mobile device may be challenging and interesting. Secondly, this study was conducted among employees working in the listed companies of SET. If further studies survey with employees working in other groups such as SMEs, the results will probably show some interesting evidences.

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