



KNOWLEDGE ACQUISITION AMONG ENGINEERS IN MNCS

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Abstract

The objective of this paper is to investigate the relationship between individual's absorptive capacity and knowledge acquisition behavior among engineers in the electrical and electronic (E&E) sector in Malaysia. The study utilized survey method to collect the data. There were 305 responses for the survey. Partial least square (PLS) properties of structural equation modeling (SEM) were used to measure the relationships between the variables. The study found only partial support in absorptive capacity ability to influence knowledge acquisition behavior.

Keyword: *Absorptive capacity, knowledge acquisition, engineers, MNCs.*



1. INTRODUCTION

The social cognitive theory views the organization as a collective social system made of individual members of organization who process information and develop knowledge within a specific organizational setting (ALBINO, GARAVELLI, & SCHIUMA, 1999). The theory also affirms that the influence of environmental factors in stimulating the person's personal factors such as attitude, learning capability and individual abilities will result to the changes in a person's behavior such as the behavior of innovativeness and acquisition of knowledge (BANDURA, 1986). The learning process in MNCs is perceived as one of the important factors that contribute to the human capital development in Malaysia since MNCs are known as technological imprint that introduces recent technology to their employees. Besides the learning activities, MNCs also contribute to significant FDI inflow into the country and is recognized as one of the important drivers to accelerate the economic growth in Malaysia (BANK NEGARA MALAYSIA, 2011).

Since knowledge is a significant asset to any organization and it provides to a firm's competitive advantage, it has been viewed as source of income generation for companies (GOH, 2002; TEERAJETGUL & CHAREONNGAM, 2008). According to Davenport et al. (1998), knowledge can be defined as the information that is combined with experience, context, interpretation and reflection. In a wider context, knowledge is actually linked to the data and information in the spectrum of its actionability and abundance (NISSEN, 2002). In other words, data and information are substantial elements of knowledge that can be applied in many forms. Data that initially exists with no meaning will be suddenly transformed into a new concept called information which goes through a series of process of integrating all of the data for it to be useful to the owners. Clarke and Rollo (2001) expanding the meaning of data by relating it with logic and reason. When both logic and reason interact with each other, new information will be formed. From information, it transforms into knowledge when it has been used and applied in decision making such as making assessment and judgment in a certain situation.

Beijerse (1999) further defined knowledge as a compilation of information through which a certain function is able to be performed and perceived as competency that is difficult to explain to others. Knowledge also has been seen as a competence which is difficult to be described but it is embedded in one's mind

(CARNEIRO, 2000). Clarke and Rollo (2001), Carneiro (2000) and Beijerse's (1999) viewed knowledge as main frame of notion and understanding developed by the human brain and it will always grow and expand through effective communication and interaction with the information received. Niessen (2002) illustrates the two-dimensional concepts which begin with the interrelationship between abundance and actionability. Within this interrelationship, data, information, knowledge, and inquisitiveness were ranked according to its' actionability, according to the ability of those elements transforming it selves into practice or being applied at workplace.

Before the interrelationship between abundance and actionability was introduced by Niessen (2010), Clarke and Rollo (2001) conceptualized knowledge as a knowledge hierarchy, which encompasses the concept of data, information, explicit knowledge, tacit knowledge, insight, and wisdom. However, the elements inside their model require matching with specific processes including aggregating the data, processing the information, interpreting the explicit knowledge, thinking the tacit knowledge, and finding the meaning with insight and wisdom. In other words, knowledge exists through a blending of information with skills, understanding, and practices. Similarly, knowledge also refers to the capability of oneself to translate the data and information into a suitable action which is beneficial to them in a specific situation (BEIJERSE, 1999).

2. LITERATURE REVIEW

2.1. Absorptive Capacity

Since it was introduced by Cohen and Levinthal (1989; 1990), the definition of the construct has evolved according to different context and scope of studies. Cohen and Levinthal (1990) define absorptive capacity as the capability to value, assimilate, and apply the knowledge from external sources. However, during the process of developing the absorptive capacity construct, the individual cognitive structures and knowledge acquisition capabilities are applied, mainly referring to a part of the organizational learning process in an organization. Cohen and Levinthal (1990) have also claimed that absorptive capacity of a firm is basically derived from individual absorptive capacity because organization will never learn but individual will. Even though organizational absorptive capacity is a not a cumulative of individual absorptive capacity in a firm, but individual absorptive capacity still plays a dominant role in overall firm's absorptive capacity.

Zahra and George (2002) had re-conceptualized the definition of the construct into a new dimension of absorptive capacity, stating that absorptive capacity is a set of capabilities to acquire, assimilate, transform, and exploit knowledge. Tu et al., (2006) relate the refinement of absorptive capacity by Zahra and George (2002) as the organizational mechanism that facilitates the process to identify, communicate, and assimilate the relevant external and internal knowledge.

Absorptive capacity is unique as it is applicable in multiple-level construct, either at individual, organization, or intra-firm level. However, initially, absorptive capacity started at the individual level that emerged with the prior related knowledge of individuals and the diversity of their background (COHEN & LEVINTHAL, 1990). It was argued that the firm's ability to absorb knowledge will strongly depend on the ability of the individuals in organization to absorb knowledge, in addition to the characteristics of individual members in that organization.

Cohen and Levinthal (1990) clearly stressed that the organization's absorptive capacity always rely on the individual absorptive capacity of their employees. In brief, the individual absorptive capacity can provide significant impact to the firm's learning process especially when that particular firm is involved in knowledge transfer activities (TANG, MU, & MACLACHLAN, 2010). So, it is important to extend the concept of absorptive capacity to the individual level especially in cognitive domain because it can reflect the organizational competitive advantage and performance. Due to the importance of individual absorptive capacity to the organization, prior investment to develop the individual absorptive capacity is necessary in order to improve the firm's performance and competitive advantage.

With regard to the concept of individual absorptive capacity, Hamel (1991) argues that in an organization, the individual capacity to absorb knowledge is not equally distributed. Everybody has different capability to absorb knowledge because individual capabilities rely on prior related knowledge such as prior educational background and exposure to that particular field, and the motivation of the individual workers. Under certain condition, the compulsory skill to observe, interpret, apply, and improve the knowledge only belong to certain employees, while others might not possess those skills (HAMEL, 1991). When this occurs, the effectiveness of knowledge transfer activities in either inter or intra-firm knowledge transfer will be lower in view of the fact that individual employees in a firm play a vital role in overall

knowledge transfer process (TANG et al., 2010). This statement is supported by Kwok and Gao (2006) stating that individuals who possess better absorptive capacity will be more competent in learning, assimilating, and utilizing knowledge. Hence, the initiative to strengthen the individual absorptive capacity in organization is important in order to stimulate the organizational absorptive capacity that results in better outcome for the organization such as better organizational performance and the-state-of-the-art of innovation (PARK, SUH & YANG, 2007; LICHTENTHALER, 2009; VINDING, 2006; ARBUSSA & COENDERS, 2007).

2.2. Knowledge Acquisition

Past research in the field of international business studies has established the benefit of MNC spillover effects to developing nations through the spillover of advance technologies, knowledge, and skills to individuals, firms, and industries (TEECE, 1980). The technology, knowledge, and skill spillover however relies heavily on the effectiveness of knowledge acquisition activities among local employees. MNCs normally expand their operations through transferring knowledge from headquarters to subsidiaries (MINBAEVA et al., 2003). However, the transfer process requires reciprocity from both MNCs and their employees. On the recipient side, the effectiveness of knowledge acquisition is identified as the main driver for successful knowledge transfer within MNCs. Similarly, intra-organizational knowledge transfer is also related to the extent to which individuals acquire and apply the knowledge they have obtained (MINBAEVA et al., 2003). This directly reflects to the role of individuals in knowledge transfer process that is conceptualized as knowledge acquisition process. This process is also related to the capabilities of acquiring, integrating, storing, sharing, and applying knowledge that is crucial in building and sustaining the competitive advantage of a firm (ANH, BAUGHN, HANG, & NEUPERT, 2006). In order to perform knowledge acquiring activity, firms need to rely on the availability of domain expert from among their employees in the firm.

Generally, knowledge acquisition is an activity within the knowledge management domain that has been widely practiced among firms, especially to those who want to gain a specific knowledge in a very specific context from the targeted activities. According to Huber (1991), knowledge acquisition is the process by which knowledge is obtained. Specifically, knowledge acquisition is defined as “the acquiring of information directly from domain experts” (MYKYTYN et al., 1994, p. 98).

It is also refers to the involvement of the employees in certain activities that enables the employees to recognize and acquire the tacit or explicit knowledge (ZAHRA & GEORGE, 2002). During that process, it also requires organizational members to identify the value of knowledge, acquire, and apply it for daily tasks in their organization (COHEN & LEVINTHAL, 1990; TODOROVA & DURISIN, 2007).

Even though scholars in international business view knowledge acquisition as an organizational level constructs applied by firms and not by individuals (LYLES & SALK, 2007; INKPEN, 2000; RANFT & LORD, 2000; TSANG, NGUYEN, & ERRAMILLI, 2004; HAU & EVANGALISTA, 2007; EVANGALISTA & HAU, 2009); however, the knowledge acquisition constructs originating from these perspective only focused on issues regarding international joint-ventures and the activity between head-quarters and their subsidiaries. Furthermore, the abovementioned studies only measured knowledge acquisition process occurring at the organizational level only.

On the contrary, past research by Anderson (1987), Kanfer & Ackerman (1989), Mykytyn et al. (1994), Ackerman, Kanfer, & Goff (1995), Anderson, Fincham, & Douglas (1997), Politis (2003), Junaidah (2007), and Liu & Liu (2008), view knowledge acquisition as an individual level constructs applicable and measurable at the individual level. This perspective originates from Polanyi (1967) who stated that organizational knowledge is actually rooted in individuals and must be acquired at individual level before it is transformed into organizational knowledge. Likewise, Tosi et al. (2003, p.32) assert that knowledge acquisition as “an overt act of the person that can be observed and measured”. In addition, Bourdieu (1990) also agree that knowledge acquisition is an individual behavior derived from an individual’s interaction with tasks, resources, and people within a particular situation. Furthermore, knowledge acquisition is suitable to be measured as individual behavior and analyzed at individual level since individuals in firms are the one who acquire knowledge while organization just create the context for individuals to support the knowledge acquisition activities (ANH et al., 2006).

Prior to knowledge acquisition, the individual’s background and internal capabilities such as existing skills and individual traits will dominate the effectiveness of knowledge acquisition of a worker (POLITIS, 2003). In a narrower context, the existing skills and individual traits that encourage knowledge acquisition activities is similar to absorptive capacity. All of the elements pre requisite to knowledge

acquisition such as having a prior knowledge in related area, possessing good skills, and positive individual traits are connected to absorptive capacity. Generally, knowledge management scholars define knowledge acquisition as a part of the process in knowledge transfer activities (DARR et al., 1995; ARGOTE & INGRAM, 2000) and it involves accessing and sourcing knowledge from those who are already in possession of that knowledge (GNYAWALI, SINGAL, & MU, 2009).

Additionally, individuals are naturally heterogeneous, and therefore their capability to acquire knowledge and the behavioral pattern of knowledge acquisition itself will manifest at different stages especially in the context of intra-organizational knowledge transfer, where knowledge acquisition will ensue when it is only required. In order to absorb the knowledge transferred from transferor, employees must have prior knowledge related to that area in order for the knowledge to be transferred smoothly (MINBAEVA et al., 2010; COHEN & LEVINTHAL, 1990). Moreover, knowledge acquisition also involves acquiring information and knowledge to be applied for problem solving activities. In this aspect, individual cognition will have priority, in order to facilitate how the data are acquired, organized, assimilated, and applied within a specific organizational context (LEMON & SAHOTA, 2004).

Further explanation concerning knowledge acquisition is also described in Anderson's Skill Acquisition Model (ANDERSON, 1982; 1983). This model explains the flow in the acquisition process. During the first stage or at 'declarative stage', knowledge is acquired as a set of facts verbally. It is followed by 'knowledge compilation stage', referring to the conversion of knowledge into a procedural form of practice. The last stage refers to the 'procedural stage' involving application of knowledge in an appropriate manner (ANDERSON, 1982; 1983). In this study, knowledge acquisition will be portrayed as behavior consistent with the social cognitive theory that explains the interaction between environment, individual, and behavior.

2.3. Relationship between Absorptive Capacity and Knowledge Acquisition

The relationship between absorptive capacity and knowledge acquisition has been acknowledged in previous research such by Murray and Chao (2005), Zahra and George (2002), and Cohen and Levinthal (1990). At the organizational level, absorptive capacity is found to be positively associated with knowledge acquisition (LYLES & SALK, 2007; SZULANSKI, 1996; MOWERY et al., 1996; GUPTA &

GOVINDARAJAN, 2000; LANE et al., 2001). The organization's absorptive capacity is represented by the employees' cumulative absorptive capacity in a firm. Specifically, the organizational absorptive capacity is conceptually an aggregate of individuals' absorptive capacity in a firm.

In a nutshell, individual absorptive capacity refers to the capability of oneself to understand new knowledge, assimilate, and applying it as activities that can be commercialized (COHEN & LEVINTHAL, 1990). At the individual level, absorptive capacity has the potential to influence the knowledge acquisition behavior of an individual since the behavior of acquiring knowledge relies on ones' capabilities and knowledge in the respective field. In knowledge acquisition activities, absorptive capacity has perceived to be very important during this process (COHEN & LEVINTHAL, 1990; MURRAY & CHAO, 2005). The behavior of knowledge acquisition is a process to which knowledge is acquired from any domain expert or any authenticated source of knowledge. This behavior can also be viewed as a major learning process in an individual learning behavior (ZHANG et al., 2007). During this process, the capability to learn while equipped with prior related knowledge and skills is a prerequisite for successful knowledge acquisition (MYKYTYN et al., 1994).

Prior related knowledge such as fundamental skills, shared language or basic knowledge in scientific and technological area in the other hand presents the true ability of oneself to acquire specific knowledge. Specifically, that capability is allude to the absorptive capacity of individuals that may vary from one to another due to the differences in their professional experience, educational background, and prior working experience (KWOK & GAO, 2006). Theoretically, individuals with refined absorptive capacity will be able to acquire more knowledge since the relationship between absorptive capacity and knowledge acquisition is expected to be present (MURRAY & CHAO, 2005; MYKYTYN et al., 1994; KWOK & GAO, 2006), but the strength of the relationship is yet to be proven. Therefore, this study empirically investigates the direct linkage between individuals' absorptive capacity and knowledge acquisition. Therefore, this study proposes the hypotheses as follows:

H1: Individual absorptive capacity will significantly influence individual knowledge acquisition.

H1a: The ability to identify knowledge will significantly influence individual knowledge acquisition.

H1b: The ability to assimilate knowledge will significantly influence individual knowledge acquisition.

H1c: The ability to apply knowledge will significantly influence individual knowledge acquisition.

3. METHODOLOGY

3.1. Data Collection Method

In the sample selection process, the researcher began with identifying the MNCs that operate in electrical and electronic (E&E) sector. A master list that contained 334 MNC companies that actively operate in E&E sector was obtained from Malaysian Investment Development Authority (MIDA). Out of 334 MNCs, the sample companies are randomly chosen based on systematic sampling technique. All odd numbered firms from the list were chosen as sample companies for data collection process. Out of 334 companies from MIDA directory, 169 companies were chosen. For each company, five questionnaires were distributed to the engineers via the human resource manager, which involves a total of 845 set of questionnaires distributed.

In this study, the data was collected via survey method. The survey questionnaires were distributed through mail survey and 'drop and collect' approach. The reason for the selection of these two methods is due to the ability to obtain the data in a wider geographical area with lower costs compared to interview and phone call approaches (HOCHSTIM & ATHANASOPOULOS, 1970), respondents can answer the questionnaire conveniently, the identity of the respondents are kept confidential, and the data is able to portray the population accurately (ZIKMUND, 2003; BRYMAN & BELL, 2011).

In this study, a total of 1245 questionnaires were distributed using mail survey and drop-and-collect approach. The reason for applying various techniques in data collection procedure is due to the ability of the combination techniques to gain higher response rate (PARKER, 1992; SCHAEFER & DILLMAN, 1998). In this study, the questionnaires' distribution was broken-up into 845 questionnaires for mail survey and 400 questionnaires for drop-and-collect approach. Of 400 questionnaires distributed via 'drop-and-collect' approach, there were 111 responses from this

method and there were 194 responses from the mail survey method. In total there were 305 (24.5%) responses.

To test the hypotheses of this study, PLS (Partial Least Square) analysis was utilized as it is the most appropriate method to meet the research objectives and to adapt to the research data conditions. Conceptually, the partial least square (PLS) is similar to multiple regression analysis because both objectives are to maximize the explained variance in the dependent constructs (MARCOULIDES et al., 2009).

3.2. Measures of Individual Absorptive Capacity

The measurement for individual absorptive capacity in this study was adapted from the work of Wall et al. (2011), Pedrosa and Jasmand (2011), Whangthomkum et al. (2006), Kwok and Gao (2006), and Flatten et al. (2011). The justification behind the selection of the instruments from these authors is due to the inability of the instrument from a single individual author to properly capture the concept of absorptive capacity. The combination of instruments from different authors into specific dimensions is essential in order to match it to the central conceptualization of absorptive capacity based on Cohen and Levinthal (1989; 1990). They conceptualized the absorptive capacity as the capability to identify, assimilate, and apply knowledge. In this study, the instrument of individual absorptive capacity is divided into three dimensions, which involve the ability to identify, assimilate, and apply. All of the items apply five-point scale, ranging from very low (1) to very high (5).

3.3. Measures of Individual Knowledge Acquisition

Basically, knowledge acquisition is defined as accessing and getting knowledge from other parties, manuals and self-learning through trial and error (GNYWALI et al., 2009). Knowledge acquisition is classified as a behavior and it 'could be further deconstructed into internal process' (MINBAEVA et al., 2010, p.5). In other words, knowledge acquisition is also 'an overt act of the person that can be observed and measured' (Tosi et al., 2003, p.32). Therefore, the constructs must fall under behavioral domain, specifically in this context applied as individual behavior. Rooted from an extensive literature review, eight items were adapted from Junaidah (2007), Kim and Lee (2010) and Silver and Marvel (2011). The purpose of these instrument items is to obtain the information concerning the engagement of local

employees in MNCs knowledge acquisition activities at their workplace. The measure applies five point scale ranged from (1) for “strongly disagree” to (5) for “strongly agree”.

4. RESULTS

4.1. Descriptive Analysis of Individual Absorptive Capacity (IAC)

The construct Absorptive Capacity (AC) consists of three basic components, the ability to identify (ABS1), assimilate (ABS2), and apply (ABS3) knowledge. Overall, the mean value for these three components is 3.87, with standard deviation 0.41, implying that the mean score is representative with small differences in the respondents’ answers. The individual mean values for these three components are 3.88 for the ability to identify knowledge, 3.89 for the ability to assimilate knowledge, and 3.87 for the ability to apply knowledge. The mean value of individual absorptive capacity at 3.87, which is approaching 4.0, and a very small standard error of 0.023, shows that on average, indicating the ability of local workers in foreign MNCs to absorb knowledge is relatively high.

Table 1: Descriptive Statistics for Absorptive Capacity

Construct	Number of Items	N Statistic	Mean		Std. Deviation
			Statistic	Std. Error	Statistic
ABS 1	4	305	3.88	.02644	.46167
ABS 2	4	305	3.89	.02825	.49336
ABS 3	6	305	3.87	.02840	.49620

The mean value for the construct individual knowledge acquisition is 3.97, with a standard deviation of 0.48 and standard error for mean of 0.02. These results suggest that the mean score of this construct is representative of the majority of the respondents. That is, on the average, the respondents who work with foreign MNCs performed the knowledge acquisition activities at their workplace to a substantial level. This is a good indicator for knowledge spillover effect from MNCs to local workers.

Table 2: Descriptive Statistics for Knowledge Acquisition

Construct	Number of Items	N Statistics	Mean		Std. Deviation
			Statistic	Std. Error	Statistic
KA	5	305	3.9765	.02782	.48587

Based on the results from the hypotheses testing, the ability to identify knowledge has a significant effect on individual knowledge acquisition as evidenced by the coefficient value of 15.8 percent with $T = 2.46$ which is significant at $p < 0.01$. However, the ability of an employee to assimilate knowledge does not affect the individual knowledge acquisition. This is demonstrated by a very small T value of 0.13 with coefficient value of 0.9 percent. As for the item ability to apply knowledge, it significantly influences individual knowledge acquisition, with a beta value of 26 percent ($T = 3.35$) and significance at $p < 0.01$. Overall, hypotheses H1a and H1c are supported, but H1b is not supported.

Table 3: The Summary of Hypothesized Structural Relationship between Absorptive Capacity and Knowledge Acquisition

Hypotheses	Relationship	Full Model			Supported
		β	S.E	T	
H1	ABS → KA				
H1a	ABS1 → KA	0.1588	0.0646	2.46**	Yes
H1b	ABS2 → KA	0.0099	0.0783	0.13	No
H1c	ABS3 → KA	0.2672	0.0767	3.48**	Yes

Note: (*) Significant at $p < 0.05$, (**) Significant at $p < 0.01$ base on one-tailed t-statistics table, as t-value greater than 1.65, it is significant at $p < 0.05$, while t-value at 2.35 or greater, it is significant at $p < 0.01$.

4.2. Discussion and Conclusion

As indicated by the results of H1a and H1c, this study has proven that individual absorptive capacity has partial influence on employees' knowledge acquisition. This result is parallel to the results obtained by Murray and Chao (2005), Mykytyn et al. (1994), and Kwok and Gao (2006).

Thereby, the ability to identify knowledge and the ability to apply knowledge were found to be good predictors for individual knowledge acquisition, but the ability to assimilate knowledge was found to not have any influence on individual knowledge acquisition. In the context of MNCs, normally, training is provided to the employees with the objective that the employees will acquire the knowledge provided during the training and is applied in their workplace. In most cases, as reflected from the results, the workers identify the training they require to improve their performance, and after acquiring the knowledge, it is applied by the employees in their workplace. Hence, in this context, the presence of the ability to assimilate knowledge is not required to stimulate individual knowledge acquisition. This phenomenon is potentially due to the

type of knowledge the workers obtain and identify during the training or knowledge acquisition process.

Due to their structure and specific needs, procedural knowledge, such as process, product design, and know-how knowledge, is most commonly distributed across organizations (GUPTA & GOVINDARAJAN, 2000). Alternatively, declarative knowledge, such as monthly sales statistics and annual financial data, that requires higher ability to assimilate since it is less tacit compared with procedural knowledge (POLANYI, 1967), gains less attention in knowledge transfer activities in MNCs (GUPTA & GOVINDARAJAN, 2000). The tacit elements in procedural knowledge that are transferred in MNCs via in-house training, peer-sharing and mentoring require the ability to identify and apply knowledge but not to assimilate knowledge, and thus, providing a reason why the hypothesis relating to the ability to assimilate knowledge is not significant to individual knowledge acquisition. Nevertheless, the ability to identify and apply knowledge has significant influence on individual knowledge acquisition, which is linked to the tacit nature of knowledge transferred in MNCs. In conclusion, the results suggest that individual knowledge acquisition in MNCs is only influenced by the employees' ability to identify and apply knowledge. Both of these abilities are essential for local employees to successfully perform knowledge acquisition their respective work environment.

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