

# The Effect of Leverage Factors of Learning to Product Quality\_Research Of Business and Management

*by* Leonardus Rengkung 10

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## THE EFFECT OF LEVERAGE FACTORS OF LEARNING TO PRODUCT QUALITY OF WOODEN HOUSE INDUSTRY AT WOLOAN DISTRICT, NORTH SULAWESI, INDONESIA

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**Hardus Ricky Rengkung**

Sam Ratulangi University, Jln. Kampus Unsrat Bahu, Kleak, Malalayang Manado, Sulawesi Utara, Indonesia. [lrrengkung@gmail.com](mailto:lrrengkung@gmail.com)

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### ABSTRACT

**Purpose-** The purpose of this study is to determine the ability and to analyze the effect of leverage factors of learning to product quality in Wooden House Industry at Wololoan District, North Sulawesi, Indonesia, as well as to predict the probability of this industry to produce quality products.

**Methodology-** To answer these purposes, the Logistic Regression is being applied to 38 firms and customers. There are 22 firms that are able to produce good quality and 16 firms that produce less quality. Predictly, there are 19 firms that are able to produce good quality, 12 firms that produce less quality, and 3 firms that obviously are able to produce good quality but predictably unable to produce good product, and 4 firms that obviously produce less quality, but predictably will be able to produce good quality.

**Findings-** The leverage factors of learning have a significant effect on product quality. Simultaneously, all factors have significant effect on the product quality, partially, factors of knowledge acquisition, knowledge assimilation and knowledge exploitation have significant effect, part knowledge transformation.

**Conclusion-** It can be concluded that learning process should be applied as a routine and sustainable activity for this industry to produce quality products. The role of management in this process is to acquire new and relevant knowledge, to utilize and optimize knowledge, to increase research and development, to optimize human resources, to initiate new thinking, to innovate new product, and to identify new solutions to solve problems.

**Keywords:** Knowledge acquisition, knowledge assimilation, knowledge transformation, knowledge exploitation, learning and quality.

**JEL Codes:** D83, E32, L21

### 1. INTRODUCTION

Nowadays, there are many changes in organizational environment such as changes in technology, social, politic, legal or economic. Organizations need to analyze and understand the pattern of those changes. Understanding those changes is very important for running an organization successfully, either governmental or business organization. In their daily activities, every organization continually interacts with this situation of dynamic environment. The ability of organizations facing and adapting to such dynamic and competitive environment will affect the ability of organizations achieving and maintaining their competitiveness.

The concept of organizational environment has indeed become a major focus of organizations in the business strategy. Business environment has been defined as uncertain and hyper dynamic (Jones, 1994). The uncertainty of business environment requires organizations to maximize their strategy ability to deal with it, so that they can maintain their existence and competitive advantages. Jones (1994) also defines that the organizational environment is the set of resources surrounding an organization, and according to (Haberberg and Rieple, 2008), it is a complex system and unpredictable. As a system, Cyert and March (1992) view the organization as an adaptively rational system that is constrained by environmental uncertainty, problems of multiple goals and interests, and limitations in its information-

processing capabilities. Senge (1990) points out that organizations need to adapt to their changing environment and Hatch (1997) says that every organization interacts with other members of its environment. Organizations need to avoid uncertainty by focusing on the short term and attempting to control the environment (Choo, 1998), and failure to address major environmental changes can negatively affect firms' performance (Barreto, 2010).

There are several paradigms associated with the existence of the organization facing the uncertain and environmental dynamics, such as the industrial organization paradigm developed by Porter (Porter, 1980), strategic conflict paradigm of Shapiro and resource-based view paradigm of Wernfelt (Barney and Clark, 2007), dynamic capabilities paradigm of Teece (Teece, et al., 1997), as well as, learning paradigm of Senge (Gilley and Maycunic, 2000). Generally, all these paradigms seek to answer the questions in strategic management, such as what the difference between a successful organization and an unsuccessful organization is, how organizations make a difference in their performance, why some organizations have more performance than others (Barney and Clark, 2007), how organizations increase their learning ability of facing dynamic environment, and how firms achieve and sustain competitive advantages (Teece, et al, 1997).

From a strategic standpoint, this dynamic environment is related to how organizations optimize their strengths, measure their weaknesses, exploit opportunities and analyze threats. These factors occur due to the existence of all organizations that cannot be separated from the business environment. According to McLeod (1995) the environment is the very important reason for firm's existence. The ability of organizations in maintaining their presence in the growing strength of competition can be done by improving the learning ability, which has been identified as a key factor for achieving competitive advantage. Failure in anticipating and learning the movement of this business environment can affect organizational performance, profit, innovation and product quality.

The ability of generating quality of product is a major factor for organizations in maintaining competitiveness and enhancing sustainability in today's competitive environment. Less quality of product can cause less competitiveness, and vice versa. As an option, Aaker (1995) says that the quality is designed ultimately to improve customer satisfaction and as a process, considered as an individual and collective learning process in organizations. Quality is determined by customer not by producer, because the basic idea, quality does not meet some criteria that the firm establishes, but the ones that customers establish (McLeod, 1995).

There are some quality dimensions of product such as performance, durability, conformance to specifications, features, name, reliability, serviceability, fit and finish (Aaker, 1995), and David Garvin (McLeod 1995) says that there are other dimensions like performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. Kotler et al., (1996), says quality tends to identify as a bases for differentiating a physical product such as features, performance, conformance, durability, reliability, reparability, style, and design.

Learning organization is one of paradigms by which it can be applied in strategic action of organization. A learning organization has developed the continuous capacity to adapt and change (Robbins and Judge, 2011), so learning is not automatic (Haberberg and Rieple, 2008) and allow an organization to develop knowledge. Senge (1990) defines the learning organization as a group of people working together collectively to enhance their capacities to create results they really care about. In many organizations, the responsibility for learning belongs to a specialized group known as training and development practitioners, who are regarded as experts in the design, and presentation of training program (Gilley and Maycunic, 2000). Moreover, as a strategic action of organization, learning is one of the organizational strategic discussing the organizational ability to routinely improve their learning efforts in facing the dynamical environment of the organization.

Organizations can create and improve their knowledge by learning and finally will improve their knowledge ability. The creation and use of knowledge is a particular organizational challenge (Choo, 1998). Slater and Narver (1995) says that effective firms are configurations of management practices that facilitate the development of knowledge that can become the basis for competitive advantage. By learning, therefore organizations routinely gather information about what is going on in organization and its environment. This seems to be a process of learning in organization. In the process of learning, there will be a process of generating and applying new knowledge as a means of improving organizational performance and increasing competitiveness (Cunliffe, 2008). This process of learning in the organization will achieve and increase knowledge that could be one of the resources in the organization.

The success of the organization applying learning ability will depend on the ability of the four factors as leverage factors of learning. Those are knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge exploitation (Zahra and George, 2002). These four leverage factors referred to absorptive capacity i.e., that the organization needs prior related knowledge to assimilate and use new knowledge (Cohen and Levinthal, 1990) and a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational ability (Zahra and George, 2002).

9  
Knowledge acquisition is an ability of the firm to acquire knowledge from and about the customer via multiple channels, knowledge assimilation is an ability to interpret the knowledge based on the previous customer-related knowledge structures, knowledge transformation is an ability to integrate the knowledge within the firm so that new value creating offerings to the customer can be developed, and knowledge exploitation is an ability to develop own internal competencies based on the new customer-related knowledge and ability to provide added value to the customer (Zahra and George, 2002).

Since it has been popularized by Senge (1990), learning organization has considerable impact on strategic management field for scholars and on daily activity business for practitioners. Many studies about learning tend to explore the relationship between learning and other factors such as, performance, capability, profitability, new product development and innovation. Unfortunately, research on the effects of learning and its role in generating quality of product has been studied little in the context of leverage factors of learning. Article of Albert (2005) is one of the articles about learning and quality explaining about the implementation of a learning organization changing process focused on improving quality in a high-technology medical instrument.

That phenomenon of environmental dynamics will be faced by any organization, especially all profit-oriented organizations, as well as by the industry of wooden house at Woloan district, North Sulawesi, Indonesia. Since this industry has been produced a product for the environment, will also interact with its customer.. The current business environment of this industry is more competitive than before. This industry is faced by the dynamic and uncertain environment with a level of strong competition, such as the increasing number of estates offered by the developers, the difficulty of raw materials, the less competitiveness of models, the declining of public interest towards home wood raw material, the use and procurement of technology, the simple management, the less quality product, as well as the competition from the same industry of other regions. Under this condition of hyper turbulent, unpredictable, uncertain, hyper competitive and dynamic environment, this industry has to increase their entrepreneurial ability. Therefore, firms have to maintain their ability related to discovering new idea, exploiting and exploring new opportunities, and improving quality of product by learning ability to maintain their competitiveness.

How the activities has been done through the years, and the learning effort of Woloan wooden house industry should keep its existence during higher competitiveness and environment uncertainty, comes problem that is figured out and being studied in this research, by analyzing the effect of learning factors, acquiring knowledge, assimilating knowledge, transforming knowledge, and exploiting knowledge, as leverage factors of learning capabilities to Woloan wooden house product quality, and predicting the probability of industry capability in producing its resulting product.

Therefore, this research aims at determining the ability of firm's learning factors within the industry of wooden house at Woloan district, North Sulawesi Utara, Indonesia that may increase their quality of product in the highly environmental uncertainty. Specifically, it analyzes about effect of the leverage factors of knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge exploitation of learning toward the product quality, as well as to predict the probability of this industry to produce quality products. Hopefully, this study will contribute to the growing body of literature learning and quality product and provides a framework for understanding how learning might appropriately viewed as a strategy to Woloan wooden house industry.

## 2. LITERATURE REVIEW

### 2.1. Organizational and Business Environment

18  
Organizations are not static, unchanging entities and they exist in uncertain environments and must continually find solutions to new problems if they are to survive and prosper (Jones, 1995). Every organization interacts with the environment, which has a bearing on the functioning/goal of organization. Hatch (1997) said that in modernist theories, the organizational environment is conceptualized as an entity that lies outside the boundaries of the organization, but for symbolic-interprettivists, they describe the environment as a social construction. The environment of any organization is the total of all actions, conditions, events and influences surrounding and affecting organization.

There are two kinds of organizational environment (Jones, 1995), namely specific environment and general environment. The specific environment consists of the outside stakeholder groups that directly affect an organization's ability to secure resources, e.g. customers, distributors, unions, competitors, suppliers and the government. The general environment consists of factors that shape the specific environment and affect the ability of all a nation's organizations to obtain resources, e.g. economic forces, international forces, technological forces, demographic and cultural forces, political forces and environmental forces. Moreover, in modernist perspective, organizational environments are typically defined by their elements. There are several different ways of sorting out these elements. Three of the most common are: the interorganizational network, the general environment, and the international/global environment (Hatch, 1997).

Organizations should have an analysis in term of main 33ing their competitiveness. An analysis of the environment and the nature of the competition that an organization faces has four main parts (Haberberg and Rieple, 2008). Those are macro-environment analysis, 53ustry life-cycle, industry structure and nature of competition. They are linked and need to be undertaken together. Environmental analysis is the process of identifying and understanding emerging opportunities and threats and it should identify such trends and events and estimate their likelihood 68 impact (Aaker, 1995). Moreover, Aaker said that there are seven dimensions of environmental analysis, namely, technology, government, economics, culture, d 43graphics, general external analysis and scenarios. In term of business , organizational environment is well-known as business environment. The term of business environment denotes many factors surrounding and having various opportunities and constraints for running a business. Understanding the business environmental dynamic is very urgent for running a business successfully.

## 2.2. Competitive Advantage

In the field of strategic management, competitive advantage has been defined as a firm consistently earning a higher rate 66 return than its competitors (Grant, 1991) Competitive advantage also is obtained by organizations w 1n they can develop a set of attributes that allow it to outperform their competitors. Moreover, Barney (1991) said that a firm is said to have a competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors. A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented 17ny current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy. Porter (1985) emphasised competitiveness at the level c 79 firm in terms of competitive strategies such as low cost and/or product differentiation 91. Following Porter (1980) states that an organization will gain a compet 12 advantage when running the so-called generic strategies, either cost leadership, differentiation or focus strategy. Sustainable competitive advantage is defined as "above-average performance in the long run" 86rter, 1985), with the amount of time defining the "long run" not specified. Those definitions are mainly about of how an organization's ability to produce and maintain the performance exceeds that of competitors.

The development of theories about competitive advantage has occupied the attention of the management community and it has been central to th 26 practice and study of strategic management. There are numerous theories about the sources of competitive advantage (Teece et al, 1997), but in their articles about D 45mic Capabilities and Strategic Management, they categorize into two main models of competitive advantage, namely models of strategy emphasizing 24 exploitation of market power and models of strategy emphasizing efficiency. According to Teece, et al, (1994), the first models of strategy emphasizing the exploitation of market power consist of Competitive Forces by Porter (1980) and Strategic C 65ict Approach by Shapiro (1989). Further, the second models of strategy emphasizing efficiency consist of Resources-based Perspective (Penrose 14 959; Rumelt, 1984; Teece, 1984; Wernerfelt, 1984) and Dynamic Capabilities Approach. The first competitive for 15 approach rooted in the structure–conduct–performance paradigm of industrial organization and emphasizes the actions a firm can take to create defensible positions against competitive forces. A second approach of strategic con 14t is closely related to the first in its focus on product market imperfections, entry deterrence, and strategic interaction. Both the competitive forces the strategic co 5t approaches appear to share the view that rents flow from privileged market positions. The third of resource-based approach focuses on the rents accruing to the owners of scarce firm-specific resources rather than the economic profits from product market positioning. Competitive advan tage lies 'upstream' of product markets and rests on the firm's idio 32atic and difficult-to imitate resources. Finally, the fourth of dynamic capabilities approach is defined by Teece (2007) as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.

## 2.3. Product Quality

The term quality has been defined many ways and according to Berry et al., a definition of quality that would hard to beat from the standpoint of simplicity, yet one that captures the current thinking in business, defines quality as "conformance to customer specifications" (McLeod, 1995).

Aaker (1995) says that the prototype of differentiation is a quality strategy in which a business will deliver and be perceived to deliver a product or service superior to that of competitor. A reputation for quality is the most frequently mentioned sustainable competitive advantage. Furthermore, McLeod (1995) says that the basic idea is that quality is not meeting some criteria that firm establishes; rather it is meeting criteria that the customers 64 plish. The key to achieving this type of quality, therefore, is knowing who your customers are and what they want. The quality option is designed ultimately to improve customer satisfaction (Aaker, 1995).

David Garvin identified eight dimensions of product quality, such as performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived the quality and five dimensions of service quality, such as tangibles, reliability, responsiveness, assurance and empathy (McLeod, 1995).

Good quality depends on good management of firm. The main focus of quality management is to meet customer requirements and to strive to exceed customer expectation. Quality management is the concept that the firm can achieve the desired level of quality in its process, products, and services by some fundamental management practices. Some quality management concepts are Deming's Fourteen Points, Juran's Quality Trilogy, Feigenbaum's Total Quality Control, and Strategic Quality Management. The approach to strategic quality management that is attracting the most attention is Total Quality Management (TQM) (McLeod, 1995).

Total quality management (TQM) is a technique developed by W. Edwards Demming to improve the efficiency of flexible works teams, and the broad goal of TQM is continuous improvement (Jones, 1995). TQM starts with the adoption of a philosophy of quality throughout an organization-quality not only in the things produced in the manufacturing department but also in the knowledge technology of every function. The foundations of TQM are (1) quality is defined by customer, (2) quality is achieved by management and (3) quality is a firm-wide responsibility (McLeod, 1995). TQM is an interesting subject for firms because they understand that the firm can achieve a competitive advantage by means of quality.

#### 2.4. Organizational Learning and Learning Organizations

Learning is a major element that enhances organizations' sustainability and success in today's competitive environment. In other words, by learning, organizations can successfully enhance their knowledge in facing the uncertain environments. Learning is a process, that is, often relational in the sense of relying on interaction between people to determine what needs improving and how to do it. The process of learning at organizational level is described as the process by which new knowledge created in order to contribute to the strategy organization and to learn to adapt the changes in the environment. Senge (1990) pointed out that organizations need to adapt to their changing environments and the changes in the economic environment from local, to national, to global markets requires new perspectives. In this case, organization should innovate and generate knowledge by a constant learning process which they create new strategy.

The concept of the learning organisation was popularised by Peter Senge's book *The Fifth Discipline: The Art and Practice of the Learning Organization* (Senge 1990). The learning organisation is a concept that has been around for some twenty years now. However, the efficacy of the concept and its impact on practitioners has never been evaluated. Moreover, Senge (1990) defined the learning organization as a group of people working together collectively to enhance their capacities to create results they really care about. Concepts of organizational learning: learning organizations offer useful strategies and actions in promoting organizational adaptation. They state that the phrase organizational learning suggests emphasis on process: a sequence of activities in which an organization undertakes to learn. In contrast, learning organization emphasizes unique structural characteristics of an organization that has the ability to learn. In learning organization, the focus is less on actions that result in learning, but on attributes or structural dimensions that characterized the organization as learning. Organizational learning literature generally focuses on normative models to create learning organizations. The main idea of organizational learning is an essential element to successfully compete in a global marketplace.

Within the framework of the organization's strategy, organizational learning has been regarded as a source for a possible competitive advantage of organizations. It is an important means for improving firm's performance and a critical and complex process which enables a system to adapt to environmental jolts and grow, build and sustain competitive advantageous positions. Levitt and March (1987) defined organizational learning as routine-based, history-dependent, and target oriented, using the natural metaphor between an individual's learning capacity and that of the organization. They further defined organizational learning using stories, paradigms, and frames to form a simulacrum of experiences lived by an organization's actors, enabling observers to form impressions of what happens within an organization. They claimed that organizational learning success is ambiguous and learning can be, in fact, superstitious; perhaps leading a manager to not buy products from a certain company because of past experience or impressions obtained from others. Institutional memory was presented as a challenge, as not all experiences can be recorded and later shared.

The success of the organization applying learning ability will depend on the ability of the four factors as leverage factors of learning. Those are knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge exploitation (Zahra and George, 2002). These four leverage factors referred to absorptive capacity i.e., that the organization needs prior related knowledge to assimilate and use new knowledge (Cohen and Levinthal, 1990) and a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational ability (Zahra and George, 2002). Knowledge acquisition is an ability of the firm to acquire knowledge from and about the customer via multiple channels, knowledge assimilation is an ability to interpret the knowledge based on the previous customer-related knowledge structures, knowledge transformation is an ability to integrate the knowledge within the firm so that new value creating offerings to the customer can be developed, and knowledge exploitation is an ability to develop own internal competencies based on the new customer-related knowledge and ability to provide added value to the customer (Zahra and George (2002).

## 2.5. Development of Hypotheses

Based on the explained problems faced by this industry and the underlying theoretical framework of learning ability and quality, the hypothesis of this research can be expressed as follows:

H<sub>1</sub> : Factor of knowledge acquisition as a leverage factor of learning is significantly and positively effect on quality product.

H<sub>2</sub> : Factor of knowledge assimilation as a leverage factor of learning is significantly and positively effect on quality product.

H<sub>3</sub> : Factor of knowledge transformation as a leverage factor of learning is significantly and positively effect on quality product.

H<sub>4</sub> : Factor of knowledge exploitation as a leverage factor of learning is significantly and positively effect on quality product.

## 3. DATA AND METHODOLOGY

This study uses a statistical approach in the form of Logistic Regression Model by taking all firms within the industry of Woloan wooden house as object. This site is one of central industries of wooden house in North Sulawesi House.

There are two kinds of variables, namely independent variable that is for measuring the leverage factors of learning ability of the firms and dependent variable for measuring the quality of product. Measurement of independent variables based on Learning Organization perspective, as proposed by Zahra and George (2002), Eisenhardt and Martin (2000), Senge (1990), Choo and Bontis (2002) and Gilley and Maycunich (2000).

The questionnaire of learning is divided into four groups, namely knowledge acquisition (Acqs), knowledge assimilation (Assm), knowledge transformation (Trfm), and knowledge exploitation (Expl) (Pavlou and Sawy, 2011), and took responses from the owner of the firms, where the measurement of quality is based on the eight dimensions of quality proposed by Garvin (McLeod, 2005), namely performance, feature, reliability, conformance, durability, serviceability, aesthetic and perceived quality asked to the customers. The 52-item survey about Learning Organization was administrated to all of the 38 firms in wooden house industry and 36-item survey about quality was randomly administrated to 38 customers of wooden house, representing a number of wooden house's buyers. Learning ability is measured on Likert-type scales, coded at strongly disagree (1), neutral (3), agree (5) (Cooper and Schindler, 2006), and product quality is measured on Binary choice, coded at good quality of product (1) and less quality of product (0).

This research used statistical analysis, such as Logistic Regression (Park, 2010) and Correlation Techniques (Walpole, 1993). The use of Logistic Regression model is to analyze the effect of knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge exploitation, as a factor of leverage factors of learning ability toward the quality of product, as well as to predict the probability of this industry to produce quality products. The use of correlation technique is for testing the reliability and validity of the questionnaire

## 4. FINDINGS AND DISCUSSIONS

### 4.1. Findings

Measurement of reliability and validity based on the value of correlation, either at  $\alpha = 1\%$  or  $\alpha = 5\%$  by using SPSS 22.0, showed that the correlation value of each questions for measuring the validity is above 0.6, while the correlation between the even number of items and the odd number is equal to 0.92. Based on Rozan (2009) quoting from Friedenberg, the indicator of valid questionnaire is satisfied if the correlation coefficient is greater than or equal to 0.30, while Rantung (1992) quoting from Portes (1986) said that the indicator of reliable questionnaire is satisfied if the correlation coefficient between the even number of items and the odd number of items is greater than 60%. Therefore, it can be concluded that all of the question items used in this study are valid and reliable to measure the leverage factors of learning ability on the firm's ability to produce quality products.

Based on SPSS 22.0 output showed in the following table 1 of Classification Product Quality, it can be explained about the ability of the factors of knowledge acquisition, knowledge assimilation, knowledge transformation, and knowledge exploitation as leverage factors of learning ability in affecting the quality of products. The effect of those four leverage factors shows that 38 firms, there are 22 firms (57.9%) have good quality of wooden house production (category 1) and 16 firms (42, 1%) have less quality of wooden house production (category 0).

**Table 1: Product Quality Category**

	Observed		Predicted		
			Quality		Percentage Correct
			Less	Good	
Step 0	Quality	Less	0	16	.0
		Good	0	22	100.0
Overall Percentage					57.9

Source: Processed from Output of SPSS version 22

The following table of Categorical Variables Coding (table 2) explains about ability of all leverage factors of firm's learning. The results show that there are 19 firms (50%) that are able in knowledge acquisition (Acqs) and 19 firms (50%) that are unable in knowledge acquisition (Acqs). There are 14 firms (36.8%) that are able in knowledge assimilation (Assm), and there are 24 firms (63.2%) that are unable in knowledge assimilation (Assm), as well as in knowledge exploitation (Expl). There are also 26 firms (68.4%) that are able in knowledge transformation (Trfm) and 12 firms (31.6%) that are unable in knowledge transformation (Trfm).

**Table 2: Categorical Variables Coding**

Ability of Leverage Factors of Learning		Frequency	Parameter Coding
			(1)
Acqs	Unable	19	1.000
	Able	19	0.000
Assm	Unable	24	1.000
	Able	14	0.000
Trfm	Unable	12	1.000
	Able	26	0.000
Expl	Unable	24	1.000
	Able	14	0.000

Source: Processed from Output of SPSS version 22

The prediction of the ability of the firms within this industry in generating quality of product can be shown in the table 3. Predicted that there are 12 firms (31.6%) producing less quality, and 19 firms (50%) producing good quality. The results also showed that there are 3 firms (7.9%) obviously able to produce good quality, but predictably in the future, they are not able to produce quality product. Furthermore, there are 4 firms (10.5%), obviously able to produce less quality, but predictably in the future these four firms will be able to produce a good quality product.

**Table 3: Product Quality Prediction**

Observed		Predicted		
		Quality		Percentage Correct
		Less	Good	
Quality	Less	12	4	75.0
	Good	3	19	86.4
Overall Percentage				81.6

Source: Processed from Output of SPSS version 22

#### The effect of leverage factors of learning

A binary Logistic Regression is used to examine the effect of leverage factors of learning to the quality product of wooden house at Woloan district. The effect of these leverage factors (variables) of learning can be shown on table 4 of Variable in The Equation, as follow.



Table 4: Variables in the Equation

Leverage Factors of Learning	B	S.E.	Wald	Df	Sig.	Exp(B)
Acqs	3.324	1.100	9.136	1	.003	27.759
Assm	4.175	1.544	7.316	1	.007	65.046
Trfm	2.106	1.162	3.284	1	.070	8.216
Expl	-4.536	1.749	6.725	1	.010	.011
Constant	-1.452	.944	2.368	1	.124	.234

Source: Processed from Output of SPSS version 22.0

H<sub>1</sub> posited that factor of knowledge acquisition as a leverage factor of learning is significantly and positively effect on quality product and H<sub>2</sub> posited that factor of knowledge assimilation is significantly and positively effect on quality product. The coefficients in Table 4 indicate that quality product is influenced significantly and positively by knowledge acquisition (Acqs) (B = 3.324 and Sig.= 0.003 < 0.05), and knowledge assimilation (Assm) (B=4.175 and Sig = 0.007 <0.05). H<sub>3</sub> posited that factor of knowledge transformation as a leverage factor of learning is significantly and positively effect on quality product. Result in Table 4 indicates that knowledge transformation (Trfm) is positive but not significant because of B = 2.106 and Sig.= 0.070 < 0.05. H<sub>4</sub> posited that factor of knowledge exploitation as a leverage factor of learning is significantly and positively effect on quality product. Result shows that quality product is influenced significantly but negatively by knowledge exploitation (Expl) with the value of (B = -4.536 and Sig.= 0.010 < 0.05).

**Logistic regression model and probability of quality product**

Based on Table 2, the logistics regression model is constructed, as follows;

$$\ln \left( \frac{P}{1-P} \right) = -1.452 + 3.324 \text{ Acqs} + 4.175 \text{ Assm} - 4.536 \text{ Expl}$$

or,

$$\text{Probability} = \frac{\exp(-1.452 + 3.324 \text{ Acqr} + 4.175 \text{ Assm} - 4.536 \text{ Expl})}{1 + (-1.452 + 3.324 \text{ Acqr} + 4.175 \text{ Assm} - 4.536 \text{ Expl})}$$

Construction of the model can be expressed to estimate the probability of firms to produce a quality product based on three significant factors of firms' learning ability. There are 8 combinations of leverage factors of learning (A, B, C, D, E, F, G and H). The next table 5 shows the result of firm's probability producing quality product.

Table 5: The Probability of Producing Good Quality

Combinations of leverage factors of learning	Acqs	Assm	Expl	Probability
A	1 (Able)	1 (Able)	1 (Able)	99.97%
B	1 (Able)	1 (Able)	0 (Unable)	99.76%
C	1 (Able)	0 (Unable)	1 (Able)	98.16%
D	1 (Able)	0 (Unable)	0 (Unable)	86.66%
E	0 (Unable)	1 (Able)	1 (Able)	99.21%
F	0 (Unable)	1 (Able)	0 (Unable)	93.83%
G	0 (Unable)	0 (Unable)	1 (Able)	65.78%
H	0 (Unable)	0 (Unable)	0 (Unable)	18.97%

Source: Output of Microsoft Excel 2010, based on Output SPSS version 22

Firms (A) are able in knowledge acquisition, knowledge assimilation, and knowledge exploitation with the probability of 99.97% in producing good quality, compared to firms (H) that are unable in those three factors with the only probability of 18.97%. Firms (B) are able in knowledge acquisition and knowledge assimilation with the probability of 99.76% in producing good quality, compared to firms (G) that are only able in factor of knowledge exploitation with the probability of 65.78%. Firms (E) are able in knowledge assimilation and knowledge exploitation with the probability of 99.21% in producing good quality, compared to firms (D) that are only able in factor of knowledge acquisition with the probability of 86.66%. Firms (C) are able in knowledge acquisition and knowledge exploitation with the probability of 98.16% in producing good quality, compared to firms (F) that are only able in factor of knowledge exploitation with the probability of 93.83%.

## 4.2. Discussions

51

This study is based on the theory of absorptive capacity which is first introduced by Cohen and Levinthal (1990), by analyzing on factors of knowledge acquisition, knowledge assimilation, knowledge transformation and knowledge exploitation which are level factors of the organizational learning to acquire and apply external knowledge for competitive advantage. They label this capability as a firm's absorptive capacity and suggested that it is largely a function of the firm's level of prior related knowledge. This theory is about how organizational learning achieves new knowledge from outside of the organization through the process of learning by involving personal and group ability within the company. It is interesting to note that this is a very important role to implement the learning process in organization dealing with the environment uncertainty.

The good quality of 22 firms (57.9%) is indicated by considering that learning process is very important factor within the firm in affecting their quality of product. Learning process will create their new knowledge and increase their innovations. Following Zollo and Winter (2002), that learning is as a stable patterns of behavior, this seems to be a good action relating to their thinking that learning process is a part of their routine activities. So that, they often attend some training conducted by government and non-governmental organizations, find information about competitors and study the behavior of consumers, as well improve their technology. They also realize that quality is not about meeting some criteria that the firms establishes, rather, it is meeting criteria that the customer establish (McLeod, 1995), as shown by this industry giving freedom for consumers to determine the model, price and type of wood.

Factor of knowledge acquisition in this industry affects the company's ability to produce quality products. This is an ability to acquire new and relevant knowledge and a trigger activation in the process of learning in organization. The role of this factor together with other factors simultaneously and positively affects the quality of the product and will generate probability of 99.97% in generating good quality product. This is an interesting finding because numerous firms in this industry have recently increased heavily in their activity of finding and generating many sources of potential information about their business environment such as consumer, market, or competitor. For example, they make an analysis to define consumer segments, to perceive customer needs and market opportunities, as well as to innovate their product to conform with market demand by generating concepts. The implication is that workers may have developed a good quality by acquiring new technologies.

The importance of the second factor, knowledge assimilation is shown in the contribution of both effect and probability to product quality. Knowledge assimilation encompasses the capacity to interpret and grasp information, to understand its application and the process from which it is derived (Reilly and Scott, 2010). The effect of this knowledge assimilation together with two other factors to probability of generating quality product is between 99.21% and 99.97%, whereas the probability of knowledge assimilation application is about 93.83%. They consider that this factor is an important thing as leverage factors of the firm learning, as quoted/expressed by Campbell (2003) that the assimilation of the new knowledge is important because without it, the knowledge cannot be disseminated to other parts in the organization and existing knowledge bases cannot be renewed. This finding is supported by the industry in increasing their research and development facilities, carpentry techniques, and human resource development.

Element of knowledge transformation has no effect on the quality of the product produce this industry. However, there are 12 firms having good knowledge transformation. As a factor of the learning process, Cohen and Levinthal (1990), said that the absorptive capacity refers not only to the acquisition or assimilation of information by an organization but also to the organization's ability to exploit it. Based on their statement, that there are only three factors in effecting to learning of organization, namely knowledge acquisition, knowledge assimilation and knowledge exploitation, and ignoring knowledge transformation factor. This opinion is consistent with the results of this study showing that knowledge transformation does not effect on the quality of the product. However, it can be suggested that they also must consider this factor of knowledge transformation, as transfers of knowledge (Cohen and, Levinthal, 1990), which is indicated by this industry in optimizing their human resources, processing raw materials efficiently, and improving the quality of product.

41

Exploitation of knowledge is as a final component (Reilly and Scott, 2010), Cohen and Levinthal (1990) says that the ability to exploit external knowledge is thus a critical component of innovative capabilities. This means that the element of knowledge exploitation is also an important and has a role in the learning organization, especially in the innovation process. The probability of this industry related to knowledge exploitation in generating quality product is 65.78%, whereas if together with knowledge acquisition and knowledge assimilation is between 98.16% and 99.97%. The application of knowledge exploitation related to the ability of firms utilize all the knowledge, initiate new thinking, innovate new product, and identify new solutions to solve problems. The ability of exploiting knowledge is demonstrated by firms within this industry by exploiting human resources and optimizing their knowledge in order to create innovative, quality and competitive products. This is about efficiency in cost, diversified in model and criteria desired by customers.

Result shows that all four of these elements are able to explain by 58.7% against the quality of the product. These elements are the leverage factors of the learning process. Pavlou and Sawy (2011), suggests that in addition to learning, there are three other factors, namely, sensing, integrating and coordinating. All three of these factors along with sensing factor of learning are important in improving dynamic capabilities of the organization, which according to (Teece, 2007) as the ability to integrate, build, and reconfigure internal and external competencies to address rapidly-changing environments.

Therefore, those three factors of 41.3% in the model, namely, sensing, integrating and coordinating may be possibly join in the model as a leverage factor in improving the quality of its products. Those factors are part of dynamic capabilities of firms in a cycle model with a sequence of sensing, learning, coordinating, integrating (Pavlou and Sawy, 2005), in a linear model (Pavlou and Sawy, 2011), as well as in the systemic model with the sequence of sensing, learning, integrating, coordinating (Rengkung, 2013). The ability to apply dynamic capabilities faster than competitors may be well is the only sustainable competitive advantage.

## 5. CONCLUSION

Leverage factors of learning in Woloan wooden house industry, knowledge acquisition, knowledge assimilation, knowledge transformation and knowledge exploitation; simultaneously have significantly affected to the quality of the product. Partially, it is concluded that the knowledge acquisition, knowledge assimilation and knowledge exploitation affect the quality of firm product, whereas knowledge transformation does not affect the quality of the product. It is predicted that there are four categories of ability to generate a quality product, First, firms that are not able to produce a quality product. Second, firms those are able to produce a quality product. Third, the category of firms that are actually able to produce a quality product, but predictably in the future, they are not able to produce a quality product and the fourth category is firms that are not able to produce quality products, but predictably in the future they will be able to produce a good quality product. All firms in this industry must therefore recognize the central role of this learning process in influencing the quality of product and apply it as a routine and sustainable activity. Some points of leverage factors of learning can be applied such as ability of acquiring new and relevant knowledge, utilizing and optimizing knowledge, increasing research and development, optimizing human resources, initiating new thinking, innovating new product, and identifying new solutions to solve problems.

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