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International Journal of Economics and Business Administration

Volume: Issue:

Volume VI, Issue 1, 2018

The Influence of Customer Retention Time on Slogan Recall and Recognition: An Empirical Study

Paulo Duarte Silveira, Susana Galvão, Paulo Bogas

International Journal of Economics & Business Administration, Volume VI, Issue 1, 3-13, 2018

[View Article](#) [Download Article](#)

Separation Process of Britain From the EU and its Impacts on Both Sides

Huseyin Ozdeser

International Journal of Economics & Business Administration, Volume VI, Issue 1, 14-23, 2018

[View Article](#) [Download Article](#)

Examining Leadership and Knowledge Sharing Role on Small and Medium Enterprises Innovation Capabilities

J.P. Kambey, N.F. Wuryaningrat, L.I. Kumajas

International Journal of Economics & Business Administration, Volume VI, Issue 1, 24-38, 2018

[View Article](#) [Download Article](#)

Towards Combining the Innovation Ecosystem Concept with Intermediary Approach to Regional Innovation Development

L. Gamidullaeva

International Journal of Economics & Business Administration, Volume VI, Issue 1, 39-53, 2018

[View Article](#) [Download Article](#)

MNC Transactions Foreign Exchange Exposure: An Application

Augustine C. Arize, Giuliana Campanelli Andreopoulos, Ioannis N. Kallianiotis, John Malindretos

International Journal of Economics & Business Administration, Volume VI, Issue 1, 54-60, 2018

[View Article](#) [Download Article](#)

Corporate Social Responsibility in Hotel Industry: Empirical Analysis of Transitional Market

Petr Cech, Irena Jindrichovska, Jiri Neubauer

International Journal of Economics & Business Administration, Volume VI, Issue 1, 61-89, 2018

[View Article](#) [Download Article](#)

Comparative Study on Sustainability of Sharia Microfinance Institutions Through Financial and Social Efficiency

Purwanto , Ina Primiana , Dian Masyita , Erie Febrian

International Journal of Economics & Business Administration, Volume VI, Issue 1, 90-100, 2018

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Examining Leadership and Knowledge Sharing Role on Small and Medium Enterprises Innovation Capabilities

J.P. Kambey¹, N.F. Wuryaningrat², L.I. Kumajas³

Abstract:

The innovation capability of a firm depends on knowledge resources. Knowledge sharing is an important part in knowledge management to optimize firm knowledge resources. However, knowledge sharing can not be automatically achieved. Leadership factor is an important factor to encourage knowledge sharing.

The purpose of this study was to examine the role of transformational and transactional leadership of the owners of SMEs to encourage knowledge sharing activity which in turn this activity can enhance innovation capability. The survey was conducted in the SME production sector in North Sulawesi Province, Indonesia. The research involved 176 samples. Data were analyzed with Structural Equation Model based on PLS-SEM variant.

The result showed that only transformational leadership had a positive effect to encourage knowledge sharing. Further, the result showed that knowledge donating had the positive effect to enhance innovation capability. Surprisingly, the result showed that knowledge collecting had a negative effect to innovation capability.

Keywords: *Innovation capabilities, knowledge sharing, leadership style.*

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1. Introduction

The capability of a firm to produce innovative commercial ends depends on the ability to manage its knowledge resources (Darroch, 2005). An effective knowledge management serves as a strategic approach which can be done by a firm to increase its benefit and gain its sustainability. Managing knowledge must be conducted in a precise way.

Knowledge sharing as a part of knowledge management is a crucial activity to effectively use the organizational resources (e.g. knowledge) (Argote *et al.*, 1999; Srivastava *et al.*, 2006). In many cases, the activities of knowledge sharing and/or transfer do not occur accidentally. Szulanski (1996; 2000) emphasizes that barriers in sharing or transferring knowledge is mainly based on the characteristics of senders and receivers of knowledge. To overcome the barriers, the role of leader (i.e. leadership) in the organization is necessary to ensure that the process of knowledge sharing/transfer goes in an effective way (Srivastava *et al.*, 2006). To clarify the idea, this research was conducted on the Small-Medium Enterprises (SMEs) with a number of reasons. First, management of SMEs is usually held by one person who acts as owner and manager (Stanworth and Curran, 1976; Indarti 2010). It makes the owner or manager a major actor in the development of employees and companies. Due to this perspective, this study intends to examine a better leadership role than in larger companies. In addition, only few research focus on the relationship between transformational and transactional leadership in the knowledge management (Crawford, 2005).

This study has similar topic as the previous research conducted by Wuryaningrat *et al.*, 2012. However, this research gives more emphasis on the role of transformational and transactional leaderships on knowledge sharing and innovation capabilities on a newly developing area (North Sulawesi). Wuryaningrat *et al.* (2012) conducted a research on the development of SMEs in the more developing region than North Sulawesi.

2. Literature Review and Hypothesis Development

2.1 Knowledge Sharing

According to Dalkir (2005) knowledge sharing is a social activity. This activity needs attitude, behavior, and motivation to encourage knowledge sharing creation (Xue *et al.*, 2011; Liao *et al.*, 2007). Without knowledge sharing, the development of knowledge will be under-utilized (Srivastava *et al.*, 2006). Knowledge sharing can be defined as tacit or explicit knowledge exchange process to make new knowledge possible (Hoof dan Ridder, 2004). Knowledge sharing includes activity to give idea, suggestion, information, experience and skill to other team members (Hoof and Rider, 2004; Bartol and Srivastava, 2002; Davenport and Prusak, 1998). According to Hoof and Rider (2004) knowledge sharing is divided in two distinct dimensions

namely knowledge collecting and donating. Knowledge donating is a process to carry or give knowledge through communication between individual or group people. Knowledge collecting can be defined as process to have knowledge from other person through consultation or persuasion to make other people willing to share his knowledge.

Knowledge sharing is the key of success to translate individual learning to organizational capability (Frey and Oberholzer-Gee, 1997; Nahapiet and Ghoshal, 1998; Lam and Lambermont-Ford, 2008). Lam and Lambermont-Ford (2008) remind that knowledge sharing is not easy to do because it depends on individual willingness to share. This problem, according to Szulanski (1996; 2000), is called stickiness of knowledge. Therefore knowledge sharing needs other factors, one of which is a leader and his leadership (Srivastava *et al.*, 2006).

2.2 Innovation as Newness

Innovation has various definitions, but it can be concluded that innovation refers to newness. According to Johannessen *et al.* (2001), innovation is a newness to create and to maintain sustainable competitiveness. Innovation is not only a physical application but also a process. According to Samson (1991) and Harrison and Samson (2002) innovation as newness is classified into three types: innovation product, innovation process and innovation managerial and system.

In this context, newness refers to what one company is able to deliver while other companies can not (Johannessen *et al.*, 2001; Tidd *et al.*, 2005). Innovation as newness refers to changes which can be regarded as innovation degree. Due to its degree, March (1991) classifies innovation into two types: exploitative innovation and exploration innovation. Tidd *et al.* (2005) also reveal degree of newness by classifying it into incremental innovation and radical innovation.

Sometimes, the changes can be easily accepted, but in some cases the change goes in a radical way and makes substantial reformation for an organisation (Tidd *et al.*, 2005). For example, when a small firm uses technology information for production process, it will undergo rapid changes which affect the firm's environment. However, the use of technology information does not become a new thing for large-scale companies. Innovation needs used knowledge and new knowledge from many sources. Customers, suppliers, universities and research institutions are the sources of knowledge for organization (Indarti, 2010). Sveiby (2001) reveals that new knowledge can be obtained from internal and external sources. New knowledge gives a positive impact to innovation capability and firm performance (Tsai, 2001).

SMEs has many problems to deal with such as low capital, low human resources level and low interest from government; however, SMEs have a potential to develop their innovation capability through their knowledge. SMEs with small number employees and simple organization structure and less involvement with government

birocracy has the advantage to absorb and share knowledge. This advantage also gives a positive impact to increase SMEs innovation capability (Ayyagari, 2006; Pelham, 2000).

2.3 Transformational and Transactional Leaderships on Knowledge Sharing

Transformational and transactional leaderships are two distinct qualities which a leader must possess. In other words, those terms are inclusive and share similar characteristics (Bass, 1985; Yukl, 2006). They support and strengthen each other (Hater and Bass, 1988; Den Hartog 1997). The relationship between transformational and transactional leadership in knowledge sharing can be understood as the social activity which require noble attitude and behavior as well as strong motivation from all organization members (Xue *et al.*, 2010; Liao *et al.*, 2007). This opinion is supported by Deluga (1990) who states that transformational and transactional leadership styles are effective to change employees' behavior.

Bass (1985; 1990) and Yukl (2006) claimed that transformational leadership is leaders' way to motivate employees to accelerate their performance, so it will exceed expectation. They classified four dimensions of transformational leadership into individual motivation, individual inspiration, individual consideration and intellectual stimulus.

A transformational leader tries to obtain his influence and power with individual approach to inspire his employees (Yukl, 2006). Therefore, the relationship between supervisor and subordinates turns into an emotional relationship which eventually builds trust between them. According to Davenport and Prusak (1998) trust is an important factor for a person to share knowledge. Through emotional relationship, it is expected that employees open themselves and have active participation in both knowledge collecting and knowledge donating. For example, emotional relationship can be described as kinship, brotherhood or friendship. In other words transformational leadership will build supervisor-subordinate relationship as if they were family (Deluga, 1990).

A strong emotional relationship between supervisor and subordinates enables the owners of SMEs to encourage the employees to involve in the development of the company by using knowledge development. An emotional relationship becomes the underlying reason for employees to willingly share their knowledge. It can be concluded, thus, that the owners or managers of SMEs having transformational leadership have the ability to change employees' attitude and behavior. As a result, they will share knowledge and foster the activities of knowledge sharing. This opinion is supported by Bryant (2003) and Crawford (2005) who have provided empirical evidences that transformational leadership has a positive influence to knowledge management and knowledge sharing. Based on the explanation above, the research hypothesis can be formulated as follows:

H1a : Leadership transformational positively influences knowledge collecting.

H1b : Leadership transformational positively influences knowledge donating.

Unlike transformational leadership, transactional leadership shapes a business relationship between supervisor-subordinates. When showing transactional leadership, a leader considers employees' knowledge as the property of the company. Deluga (1990) reveals that information and skill serve as a negotiation tool to reach working agreement.

Bass (1985) and Yukl (2006) defined transactional leadership as a transaction process between supervisor and subordinates. According to Deluga (1990), transactional leadership considers the supervisor and his subordinates as the implicit or explicit working agreement. Deluga (1990) also explains that the employees receive reward or incentive when following this working agreement. On the other hand, they will receive punishment when breaking the agreement. Bass (1985; 1990) and Yukl (2006) classified transactional leadership style into two dimensions, those are, contingent reward and management exception. Contingent rewards involve additional rewards to increase employees' motivation. Management exception can be explained as corrective or evaluation approach from a leader to evaluate employees' performance.

According to Bock and Kim (2002), knowledge sharing can be described as the economic exchange theory. This means that knowledge sharing depends on cost and benefits made by the employees. Bartol and Srivastava (2002) explained that good extrinsic reward system such as salary raise, bonus and incentive encourage knowledge sharing. In other words Bartol and Srivastava (2002) regard reward as stimulus for employees to develop knowledge through knowledge sharing.

Related to the previous opinion above, it can be stated that transactional leadership enables a leader to extend the influence and power through instrumental compliance (Yukl, 2006). For example, a leader can extend his power and influence with salary raise, promotion and punishment given when an employee makes a mistake (Yukl, 2006). Bock and Kim (2002) argued that reward and punishment serve as the common approach for a firm to encourage knowledge sharing. Those opinions can be illustrated as the relationship between teacher and student. When a teacher gives homework, student will do the homework for two reasons. First, they want to get a good score, and second, they avoid punishment. Due to the explanation, it can be stated that employees will receive extra benefits such as promotion and career development if they fulfill what the management wants including knowledge sharing activity. Otherwise, they will receive punishment from the management (Yukl, 2006; Bass *et al.*, 2003). Thus, the research hypothesis can be formulated as follows:

H2a : Transactional leadership positively influences knowledge collecting.

H2b : Transactional leadership positively influences knowledge donating.

2.4 Knowledge Sharing and Innovation Capabilities

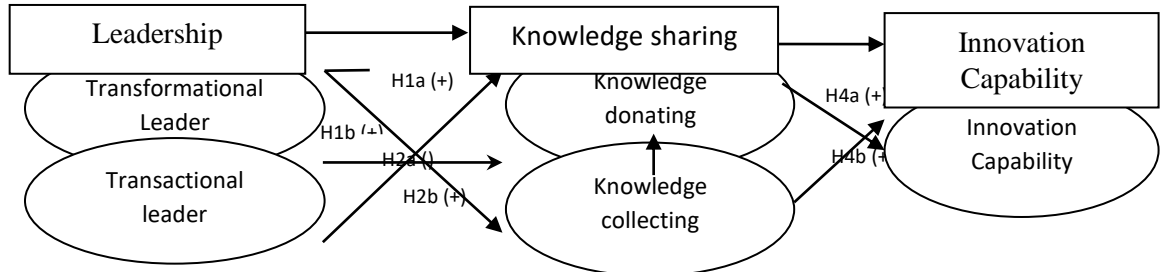
Innovation is closely linked with Nonaka and Takeuchi (1995) concept about knowledge creation. The ability of a firm to manage knowledge resources can be used for finding problem solution faster. Many previous studies gave empirical evidence that knowledge sharing can enhance innovation capability (Lin, 2007; Liao *et al.*, 2006; Darroch, 2005; Srivastava *et al.*, 2006; Tsai, 2001, Wuryaningrat, 2013). The innovation capability of a firm resulting from knowledge sharing activity can be measured by the creation of more creative ideas. These new ideas facilitate innovation activity and new business opportunity (Darroch, 2005). As mentioned before, the purpose of knowledge is to create new knowledge from internal and external sources. Thereby, to accomplish knowledge sharing, a small firm or a larger firm should have more engagement on knowledge sources such as customers, suppliers or other sources. Thus, the research hypothesis can be formulated as follows:

H4a : Knowledge donating positively influences innovation capability.

H4b : Knowledge collecting positively influences innovation capability.

Research hypotheses explained above serve as the basis for creating the research model. This research model consists of five variables. Leadership style and knowledge sharing form exogeneous variables whereas innovation capability forms endogeneous variables. Figure 1 shows the research model:

Figure 1. Research Model



3. Research Method

Two hundred questionnaires were directly distributed to the respondents. 188 questionnaires were returned, but only 176 can be analyzed because some data were missing or some did not meet the requirements set. Cross sectional survey was conducted at SMEs production sector located in North Sulawesi Province. Samples were selected based on three criteria: SMEs from production sector, SMEs production sector with minimum three-year production and SMEs with 5 to 99 employees. The owners or managers of SMEs are the major actors who take responsibilities to develop SMEs and sustain firm innovation (Stanworth and Curran, 1976; Indarti, 2010). Hence, the owner or manager of SMEs can provide

valuable information. The research was conducted at North Sulawesi Province. Respondents' profile can be seen in Table 1.

Table 1. Respondent and Business Profiles

Dimension	Categories	N
Sex :	a. Man	100
	b. Woman	76
Ages	a. <25 year	5
	b. 26–30 year	18
	c. 31-35 year	16
	d. 36-40 year	95
	e. > 40 year	42
Education Level	a. Elementary School	17
	b. Junior High School	37
	c. High School	70
	d. Diploma	8
	e. S1 (Under graduate)	43
	f. Others (S2)	1
Type of business	a. Handy craft and General	52
	b. Chemical and materials	0
	c. Metal and electric	34
	d. Food	60
	e. Clothing and leather	30
Location	a. Village	96
	b. Town	66
	c. Suburban area	14
Mean Number of employee	a. Full time	11
	b. Part time	13
Amount of Asset (last 2 years)	a. less than 5 milion	59
	b. 5 milion s/d 50 milion	89
	c. >50 s/d 100 milion	13
	d. >100 s/d 150 milion	5
	e. >150 milion	10
Salary per month	a. <50 milion	108
	b. >50 s/d 100 milion	37
	c. >100 s/d 150 milion	21
	d. >150 milion	10

Source: Primary Data (2017).

The profiles show that the respondents' age ranges from 36 years to 40 years old. Most managers or owners graduated from high school, and some graduated from university. Respondents mostly have approximately 15-year experience in business. 34.09% of respondents focus on food industry since their businesses are located in villages. These small-medium enterprises have various number of employees. Average full time employees are 11 people, and average part time employees are 13 people. Data show that all samples can be classified as small business (Classification

of BPS). Most respondents of SMEs production sector have assets ranging from 5 to 50 millions rupiah. Monthly salary are mostly below 50 millions rupiah.

This research instrument was adopted from previous research. All research constructs are measured with five point likert scale (1=almost never to 5=almost always). Transformational and transactional leaderships are measured with MLQ-1995 (Bass, 1995). Knowledge sharing which includes knowledge collecting and donating dimension are measured by Hoof and Ridder (2004) instrument. Innovation capabilities are measured by Johannessen (2001) instrument.

4. Research Results

There are two major tests in this research. First, construct validity (convergent validity and discriminant validity) and hypothesis tests. Two major steps were analyzed with Structural Equation Model (SEM) based on variant or partially least square (PLS) with computer program SmartPLS 2.0. From validity result, it is found that 24 out of 48 items are valid. 24 items were dropped because factor loading score cannot reach minimum valid score 0.5 or has cross loading (Hair *et al.*, 2010). Convergent validity test was done to determine the correlation between the research constructs. Indicators used in convergent validity are factor loading value which accumulated in its construct and AVE values (Hair *et al.*, 2010). Reliability also includes analyzing convergent validity. According to Hair *et al.* (2010), reliability is one of the convergent validity indicators. Reliability measurement suitable for PLS-SEM is composite reliability (Hair *et al.*, 2011). The result of the test can be seen in Table 2.

Table 2. *Convergent Validity and Reliability.*

Variables	Number of items	Convergent validity		Composite reliability
		Loading factor	AVE	
Transformational leader (TRF)	9	0,637-0,811	0,567	0,886
Transactional leader (TRX)	2	0,775-0,897	0,688	0,814
Knowledge donating (KD)	5	0,632-0,758	0,575	0,818
Knowledge collecting (KC)	4	0,769-0,812	0,630	0,871
Innovation capabilities (INOV)	4	0,646-0,819	0,587	0,849

Source: *Primary Data (2017).*

Table 2 shows that all research variables have loading factor and AVE value bigger than 0,5 (Hair *et al.*, 2010). Composite reliability scores for all variables shown in Table 2 are bigger than 0.7. It means that composite reliability for all constructs show the ideal value (Hair *et al.*, 2011). After conducting convergent validity, the researcher analyzes discriminant validity to compare the differences between constructs. Discriminant validity is measured by comparing AVE square root and correlation latent variable (Chin, 1995; Jogiyanto and Abdillah, 2009). Discriminant validity test result can be seen in Table 3.

Table 3. Discriminant Validity.

VARIABLES	AKAR AVE	INOV	KC	KD	TRF	TRX
INOV	0,767	1				
KC	0,794	-0,081	1			
KD	0,690	0,117	0,556	1		
TRF	0,684	0,03	0,419	0,432	1	
TRX	0,829	0,081	0,259	0,287	0,629	1

Source: Primary Data (2017).

Note: INOV: innovation capabilities, KC: knowledge collecting, KD: knowledge donating, TRF: transformational leadership, TRX: transactional leadership.

Table 3 shows all research constructs possess discriminant validity because AVE square root score is higher than correlation latent variable. It means that every construct has distinctive characteristics. Before hypothesis test, the researcher had conducted R-square (R^2) score, and the result is presented in Table 4 below.

Table 4. Model Prediction.

Variables	R Square Scores
Innovation capabilities (INOV)	0,046
Knowledge collecting (KC)	0,175
Knowledge donating (KD)	0,358

Source: Primary Data (2011).

Table 4 shows that innovation capabilities of SMEs in production sector located in North Sulawesi Province have contributed 4,6% to knowledge donating and collecting. Other variables and factors largely contribute to knowledge donating and collecting. It means that knowledge sharing is important to increase innovation capabilities, but SMEs at North Sulawesi Province do not focus their concern on that matter. All variables of knowledge sharing (KC+KD) are influenced by leadership style of the owner of SME by 53.3% while the rest is influenced by other factors. It can be concluded that leadership style is an important factor to influence knowledge sharing.

Critical ratio (CR) of 1.960 is used to determine whether the hypothesis is significant or not (for level of confidence 95%). If CR score is above 1,960 and positive, it can be concluded that hypothesis can be accepted and vice versa. The result can be seen in Table 5.

Table 5. Hypothesis Test.

Hypothesis	Correlation	Coefficient	S.E	C.R	Explanation
H1a	TRF → KC	0,423	0,085	4,941	Supported
H1b	TRF → KD	0,223	0,078	2,862	Supported
H2a	TRX → KC	-0,006	0,098	0,066	Unsupported
H2b	TRX → KD	0,028	0,088	0,321	Unsupported

H3	KC → KD	0,455	0,058	7,741	Supported
H4a	KD → INOV	0,238	0,113	2,104	Supported
H4b	KC → INOV	-0,217	0,116	1,766	Unsupported

Note: * sig. At 5%. TRF: transformational leadership TRX: transactional leadership, KC: knowledge collecting, KD: knowledge donating.

Source: Primary Data (2017).

According to Table 5 above this study concludes that hypothesis one (H1a and H1b) is accepted while hypothesis two (H2a and H2b) is not accepted. Hypothesis three (H3a and H3b) is accepted while hypothesis four (H4a) is accepted but hypothesis H4b couldn't be accepted because there is no significant negative influence knowledge collecting on inovation capabilities.

5. Discussion

The research result shows that transformational leadership has a positive influence to encourage knowledge sharing. These results are similar as in the previous study (Wuryaningrat, 2013). Bass (2003), and Yukl (2006) reveal that transformational leadership is more effective than transactional leadership. According to Gorelick *et al.* (2004), a charismatic, powerful, and passionate leader who has a clear vision and a strong faith as well as becoming role model can be a good leader to develop and manage organization knowledge resources. Those characteristics support transformational leadership.

The results also confirm Bryant's study. Bryant (2003) reveals that transformational leadership has positive effect to influence knowledge sharing activity. The result also confirms that transformational leadership can influence organization life and human from every aspect and organization behavior (Tepper 2000; Northouse, 1997). Leadership transformational is a form of emotional relationship between supervisor and subordinates (Deluga, 1990).

Hence, the connection between the owners of SME and the employees may build emotional relationship. Emotional relationships foster employees' willingness to have open attitude and behavior, so they can share knowledge (Xue *et al.*, 2011).

Other transactional leaderships could not affect knowledge sharing. Previously, SMEs in production sector at North Sulawesi Province are located on the village, and they hire most of their employees from the village too (Table 1). This is possible to build emotional relationship between employees and their leader. Research reveals that a strong emotional bond between employer and employees is possible because the sense of familyhood and friendship at rural areas is still strong. Hence, reward and punishment approach are apparently not the right approaches for the SMEs in production sector at North Sulawesi Province.

Kohn (1993) reveals that there is correlation between reward and punishment. Kohn (1993) states that reward is made by management as another form of punishment, because sometimes the employees are difficult to predict whether they are punished or awarded with a reward if they fail to achieve target. Kohn (1993) also reveals that reward could impair the relationship that has been built because it creates unhealthy competition among employees. Hence, transactional leadership style that emphasizes reward and punishment could eliminate the relationship between superior and subordinates.

The third hypothesis supports the research because it gives empirical evidence which shows how the owner or manager of SMEs perceives the employees' willingness to donate and collect knowledge. To acquire new knowledge, a manager needs to build intensive understanding and communication with the subordinates and other individuals involving in an organization. This close relationship enables employees and other stakeholders to open themselves and willing to share knowledge. Hoof and Ridder (2004) reveal that knowledge collecting can encourage people's willingness to donate their knowledge.

The following discussion is related to the fourth hypothesis (H4a and H4b). The research shows empirical evidence that knowledge donating has a positive influence to SMEs innovation capabilities. Vries *et al.* (2006) reveal that individuals who are willing to donate their knowledge have desire to be recognized by others. This research indicates that the actor of SMEs in production sector must have attitude, behavior and passion to open up their knowledge. Their attitude, behavior and passion indicate that it could be easier to transform new knowledge on innovation capabilities (Liao *et al.*, 2007).

The research also reveals surprising and unexpected results which show that knowledge collecting gives a negative effect on the innovation capabilities (although there is no empirical evidence). The concept of innovation tunnel (Clark and Wheelwright, 1992) can explain these findings. The concept assumes that the amount of knowledge, information and ideas will make a person confused and difficult to determine which relevant knowledge to deliver as innovation.

With knowledge collecting, the owner/manager of SMEs could collect knowledge from many sources including their employees, suppliers and costumers. However, the knowledge gained can trigger a problem such as difficulty and confusion in choosing or absorb relevant knowledge that can be used to make innovation.

SMEs are the business sector which has many shortages such as low education level, lack of capital and lack of technology. That shortage probably be caused of knowledge were created could not absorb well. Liao *et al.* (2007) explains that low education level will cause low knowledge absorptive capacity. Besides, SMEs in production sector usually operate based on order. Thus, the innovation ability is weak because many customers order the products based on their personal preference.

6. Conclusion

This study proves that the transformational leadership style has a positive effect on knowledge sharing activities. It can be summarized that transformational leadership style plays an important role as compared to transactional leadership in developing knowledge sharing activities in the SMEs in production sector at North Sulawesi Province. Transformational leadership style enable the owners or managers of SMEs in production sector at North Sulawesi Province to encourage the involvement of employees to work together to foster innovation. Transformational leadership is characterized by nurturing, educating, guiding, motivating attitudes and becoming a role model. Thus, these characteristics can be used to encourage attitudes, behaviors and motivation of the employees to share knowledge.

Based on this research, it can be concluded that knowledge-sharing activities require good and intensive communication. This communication is useful to create better close relationship between the owner and employees. It is expected that more individuals will be more open to knowledge. Knowledge sharing is an important element in knowledge management (Srivastava, 2006). The results of this study provide empirical evidence that the dimension of knowledge sharing has a positive effect on the innovation capabilities, while the dimension of knowledge collecting gives a negative impact on innovation capability. To sum up, the activities play an important role in increasing innovation capability. Knowledge collecting can be used to increase the knowledge donating activity.

Knowledge collecting has a negative influence on the innovation ability due to the difficulties in absorbing knowledge. It results from the inadequate number of qualified human resources, low capital level, and low technology mastery. To overcome the problems, various parties such as government need to enhance its role to enhance the innovation capabilities of SMEs.

This research has succeeded to answer research objectives. The results of this study show that the leadership of the owners or managers of SMEs plays important role to encourage the creation of knowledge-sharing activities. Knowledge sharing activities can also generate new knowledge that can be used by SMEs to increase innovation capabilities.

The results of this study also show that the expected development of SME may be a reflection to the owners or managers to further strengthen their leadership role. Thus, small-medium sized enterprises can develop better cooperation with the employees and all business elements. Eventually, knowledge sharing can be maintained in order to keep up with information, new ideas, new skills, which in turn makes SMEs more innovative.

The research has similar results as those of Wuryaningrat's study (2012) because the characteristics of SMEs are basically not different regardless of the cultural differences. In other words, culture is not the important issue in this research.

7. Limitations and Suggestions

Cross sectional survey method could be justifiable as a research limitation. Leadership is changeable through time; thus, next research can consider longitudinal survey research method. This research uses subjective perspective from the owners of SME which could result in biases, so the next research should include objectivity. For example, patent-based measuring innovation can be considered. Next research can include absorptive capacity, personality, and personal organization to find a better understanding about how innovation can be increased through knowledge sharing. That variables can be justified as moderating variables or mediating variables.

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