

# Hard Skills or Soft Skills: Which are More Important for Indonesian Teachers Innovation

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**Abstract:** The purpose of this study was to measure the influence of hard skills and soft skills on teacher innovation achievement in Jakarta, Bogor, Depok, Tangerang and Bekasi (Jabodetabek) through organizational learning as a mediating variable. Data were collected by using simple random sampling via electronic to the teacher population in Jabodetabek. The number of returned and valid questionnaires was 676. Data were processed by using SEM with SmartPLS 3.0. The results of the study concluded that hard and soft skills had positive and significant influence on teacher innovation capability, both directly and indirectly through a mediating effect of organizational learning. This study proposed a model for improving teacher innovation capability of teachers in Jabodetabek through hard skills and soft skills with organizational learning as a mediator. This study can open the way to improve teacher readiness in facing 4.0 era.

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## I. INTRODUCTION

Dramatic changes in the industrial revolution 4.0 become a new challenge for the world of education. The industrial revolution requires quality human resources that are qualified, agile, adaptive and responsive to rapid change. The world of education is facing rapid economic, social, political and technological changes. Therefore, a school must be flexible in adapting to changing situations and contexts. A school and other educational institutions need a positive and conducive environment to global

human resource competition. Therefore, it cannot be denied that a school needs synergy between teachers and the work environment that is able to make continuous improvements in innovation and performance. In the knowledge-based economy era, the knowledge society needs innovation and flexibility as energy to compete. Therefore, the strategic development of educational institutions in the future is to increase knowledge resources, especially teachers, which open space for innovation and growth.

To ensure an educational institution, especially a school, is competitive and adaptive, teachers need to be directed and involved in improving school performance. Teachers must be empowered and able to empower. As a result, a school must become organizational learning that empowers teachers as one of the main elements of school transformation and makes teachers an instrument of civilization. A school as organizational learning is very important in a rapidly changing and unpredictable environment. So that the response to change becomes an absolute requirement to form competitive human resources and win global HR competition.

The knowledge of individual teachers and a school is intellectual capital which quickly becomes a new icon of the economic value of a school. This is the new paradigm adapted from industrial revolution 4.0. Dependence on traditional productive assets such as buildings, land and other tangible assets is no longer a major investment in the future. Productive and sustainable assets in the future are intangible assets in the form of teacher knowledge. The purpose of this study was to understand and explain the influence of hard skills and soft skills of teachers on teacher innovation capability and the influence of organizational learning mediation on the relationship between hard skills, soft skills and teacher innovation in Indonesia.

## II. LITERATURE REVIEW AND HYPOTHESES

### Hard Skills

Hard skills are one type of knowledge that are easily documented and formed (Choi & Lee, 2003; Sousa & Rocha, 2019; Borrego et al, 2019; Wokcik et al, 2019; Cifariello, Ferragina & Ponza, 2019; Che et al, 2018; Tang et al., 2016; Bashir & Farooq, 2019; Attia & Salama, 2018), easily articulated (Haamann & Basten, 2018) and constitute knowledge in a school (Afsar, Masood & Umrani, 2019). In addition, hard skills can be created, written and transferred between school activity units (Lombardi, 2019). The transfer of hard skills among teachers is easier to be encouraged by conducive school mechanisms and culture.

Hard skills can be described in general and are also based on the specific context in which these skills are used. Rainsbury et al. (2002) defined hard skills as skills related to technical aspects to perform several tasks in work. Basically, hard skills are cognitive and are influenced by intellectual quotient (IQ) (Muhammad et al., 2019; Kenayathulla, Ahmad & Idris, 2019; Tsotsotso et al., 2017; Fan, Wei & Zhang, 2017). Contextually, some researchers use the concept of hard skills in management. Azim et al. (2010) referred to hard skills in the context of project management as processes, procedures, tools, and techniques (Gale et al, 2017; Laker & Powell, 2011)

Hard skills describe explicit behaviors and skills. Hard skills are skills that can produce something that is visible and direct. Hard skills can be assessed from technical tests or practical tests. The elements of hard skills can be seen from the intelligence quotient thinking that has indicators namely, counting, analyzing, designing, comprehensive knowledge, modeling, and critical thinking. Hard skills are related to mastery of science, technology, and technical skills. Teachers must have skills in opening lessons, managing classes, designing group discussions, organizing classrooms, and writing well (Muqowim, 2012). Hard skills are relatively easy to measure. Widoyoko divided hard skills into two, namely academic and vocational skills. Academic skills are the ability to master various concepts in the field of study, such as skills to define, calculate, explain, describe, classify, identify, predict, analyze, compare, differentiate, and draw conclusions from various concepts, data, and facts related to a subject (Widoyoko, 2009)

### Soft Skills

Knowledge is classified into two types, soft skills and hard skills (Polanyi, 1966). Soft skills are knowledge in the human mind and very personal (Chen et al, 2018; Holford, 2018; Khoshorour & Gilaninia, 2018; Zebal, Ferdous & Chambers, 2019; Agyemang & Boateng, 2019; Perez-Fuillerat, 2018; et al, 2018), are difficult to formulate and share naturally (Deranek, McLeod & Schmidt, 2017; Wang & Liu, 2019; Asher & Popper, 2019) so that the transformation requires

personal interaction (Lee, 2019; Asbari et al, 2020). These soft skills are rooted in actions and experiences, including idealism, values, and emotions (Boske & Osanloo, 2015; Kawamura, 2016; Hartley, 2018; Asbari, Nurhayati & Purwanto, 2019).

Based on the definition, soft skills are categorized as personal knowledge or in other words knowledge obtained from individuals or individuals (Nonaka & Toyama, 2015; Munoz et al, 2015; Stewart et al, 2017; Razmerita et al, 2016; Jaleel & Verghis, 2015; Wang et al., 2016; Serna et al., 2017; Jou et al., 2016; Rothberg & Erickson, 2017). The experience gained by each teacher certainly varies based on situations and conditions that cannot be predicted. Soft skills are not easily articulated and converted to hard skills (Mohajan, 2016; Prasarnphanich et al, 2016; Addis, 2016; Cairo Battistutti, 2017; Zang et al, 2015; Spraggon & Bodolica, 2017). However, soft skills can be empowered by the process of knowledge spiral or SECI Model (Li, Liu & Zhou, 2018; Nonaka & Hirose, 2018; Chatterjee et al, 2018; Sasaki, 2017; Lievre & Tang, 2015; Stanica & Peydro, 2016; Norwich et al., 2016; Hodgins & Dadich, 2017; Balde et al., 2018; Okuyama, 2017; Huang et al., 2016).

Every school or educational institutions must utilize the soft skills of teachers to share knowledge and keep learning. School or educational institutions will become more creative, innovative and lead in the era of education 4.0. A school can facilitate the management and use of tacit knowledge that is in the subconscious mind of each teacher with an embedding and sharing approach (Ma et al, 2018; Ferreira et al, 2018; Borges et al, 2019; Ferraris et al, 2018; Guo et al, 2018; Tsai & Hsu, 2019; Swierczek, 2019; Cantwell & Zaman, 2018).

### **Organizational Learning**

Good organizational learning will be more resilient to crises (Starbuck, 2017). Dimensions such as desire, discipline, decision making, and alignment are presented as important elements of organizational learning (Wetzel & Tint, 2019; Urban & Gaffurini, 2018; Asbari, Santoso & Purwanto, 2019). Organizational learning is an important performance indicator to evaluate overall organizational performance (Qi & Chau, 2018; Hyun et al, 2020; Asbari et al, 2020) that can build the necessary

knowledge resources and maintain school growth and continuity. The ability to access knowledge is a distinguishing factor between one school and another. The success of the school strategy is very significant related to the solid knowledge base that is owned by every individual in a school.

### **Teacher Innovation Capability**

The industrial era 4.0 requires teacher innovation capability as a competitive advantage in a school (Malik, 2019; Muscio & Ciffolili, 2019; Durana et al, 2019; Lund & Karlsen, 2019; Haseeb et al, 2019; Jakhar et al, 2018; Hamada, 2019), a competitive strategy (Culot, Orzes & Sartor, 2019), a key to facing industry era 4.0 (Stachova et al, 2019) a part of 21st-century quality management (Gunasekaran, Sabramanian & Ngai, 2019), has many advantages towards business (Zambon et al, 2019; Parida, Sjodin & Reim, 2019). Innovative capability is recognized as one of the most important internal resources that can produce superior school performance (Zouaghi et al, 2018; Santoro et al, 2017; Castela et al, 2018; Ruiz-Torres et al, 2018; Huesig & Endres, 2019). Innovation is an important aspect of quality education (Klaeijnsen, Vermeulen, & Martens, 2017).

### **The Influence of Hard skills and Soft Skills on Teacher Innovation Capability**

In the industry 4.0 era with increasingly fierce competition, sustainability remains an important concern and issue. Teacher innovation capability becomes a driver of business sustainability. This performance depends on the culture of knowledge in an organization, which consists of tacit knowledge and hard skills. Many researchers discussed teacher innovation capability and they concluded that innovation was influenced by leadership (Samsir, 2018; Schuckert et al, 2018; Villaluz & Hechanova, 2019), employee involvement climate (Naqshbandi, Tabche & Choudhary, 2019) knowledge sharing (Kim & Shim, 2018) knowledge search (Wang, Chen & Chang, 2019) collaborative culture (Yang, Nguyen & Le, 2018) and knowledge process (Imran et al, 2018). The purpose of this study was to test the influence of hard skills and soft skills on teacher innovation capability in a school to face industrial revolution 4.0. Previous studies

proved the positive and significant influence of hard skills and soft skills on teacher innovation capability (Ganguly et al, 2019; Aulawi, 2018; Rumanti et al, 2018 & 2019; Torres & Liang, 2016; Li et al, 2019). More specifically, many researchers concluded that soft skills had a significant and positive influence on teacher innovation capability (Perez-Luno et al, 2018) within the scope of business organizations. However, several researchers stated that formal & informal learning had an influence on teacher innovation capability in a school (Lecat, Beusaert, & Raemdonck, 2018). Based on the explanation above, there are hypotheses as follows:

H<sup>1</sup>: Hard skill has a direct effect on teacher innovation capability

H<sup>2</sup>: Soft skill has a direct effect on teacher innovation capability

### **The Influence of Hard skills and Soft Skills on Organizational Learning**

Organizational learning is one strategy for an organization to study the dynamics of its business environment (Senge, 1990; Zhu et al, 2018; Kasim et al, 2018; Darwish et al, 2018). A school with a managed learning routine will produce a collection of knowledgeable individuals, both hard skills and soft skills (Hussain et al, 2018). Some researchers concluded that organizational learning was influenced by collaborative culture and knowledge sharing (Nugroho, 2018). The soft skill was a very significant predictor for the development of organizational learning (Muthuveloo, Shanmugam & Teoh, 2017). Based on the explanation above, there are hypotheses as follows:

H<sup>3</sup>: Hard skill has a direct effect on organizational learning

H<sup>4</sup>: Soft skill has a direct effect on organizational learning

### **The Influence of Organizational Learning on Teacher Innovation Capability**

Knowledge creation conditioned by organizational learning will improve teacher innovation capability and organizational performance (Asbari, Purwanto & Santoso, 2019; Vijande &

Sanchez, 2017; Lin & Lee, 2017). School innovation will be sustainable if it is based on a learning culture that has added value. This learning culture makes all teachers interact with each other so that their current knowledge and new knowledge acquired can be effectively transferred, exchanged and combined into school intelligence and knowledge (Lin & Lee, 2017; Lee et al, 2016; Chang & Lin, 2015). An organizational environment that provides excitement at work is an important factor of teacher innovation capability (Bani-Melhem, Zeffane & Albaity, 2018). Based on the explanation above, there is a hypothesis as follows:

H<sup>5</sup>: Organizational learning has a direct effect on teacher innovation capability

### **A mediating effect of Organizational Learning on the relationship of Hard Skills, Soft Skills and Teacher Innovation Capability**

Honeycutt (2000) explained that knowledge management is a discipline that manages intellectual capital from managed assets. Basically, the concept of knowledge management develops from the fact that in the present and future, the main assets of an organization to be able to compete are intellectual assets rather than physical assets. In general, knowledge management carried out by organizational learning is a way to manage knowledge in organizations to create value and increase competitive advantage. Organizational learning as a mediating variable plays a role between hard skills, soft skills, and organizational innovation. In addition, this process has been considered a system where knowledge and skills are input, organizational learning is the main process, and organizational innovation is an important output (Nouri & Ghorbani, 2017; Chang, Liao & Wu , 2017).

Based on the explanation above, there are hypotheses as follows:

H<sup>6</sup>: Hard skill has an indirect effect on teacher innovation capability through a mediating effect of organizational learning



H<sup>7</sup>: Soft skills has an indirect effect on teacher innovation capability through a mediating effect of organizational learning

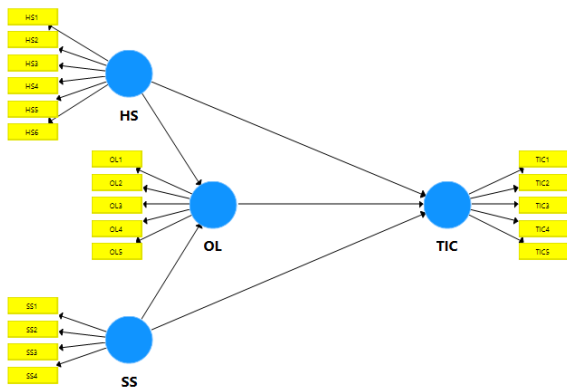


Figure 1. Research Model

### III. METHODS

#### Operational Definitions of Variables and Indicators.

This study used quantitative methods. Data were collected by distributing questionnaires to all teachers in schools. This study used 6 items to measure hard skills by Hendarman & Cantner (2017). This study used 4 items to measure soft skills by Hendarman & Cantner (2017). Organizational learning by Jimenez-Jimenez and Sanz-Valle (2011) was measured by using 5 items. Teacher innovation capability by Lee & Choi (2003) was measured by using 5 items. This study uses close-ended questionnaires except for questions/statements about the identity of respondents in the form of semi-open questionnaires. Each closed question/statement item has five answer options, namely: strongly agree (SS) with a score of 5, agree (S) with a score of 4, fairly disagree (KS) with a score of 3, disagree (TS) with a score of 2, and strongly disagree (STS) with a score of 1. Data were processed by using the PLS method with SmartPLS version 3.0 software.

#### Population and Sample

The population in this study were teachers in Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) which numbers were not identified. The questionnaire

was distributed electronically with a simple random sampling technique. The number of returned questionnaires was 684 and valid questionnaires was 676. So, 98.83% questionnaires were valid from the number of questionnaires collected.

### IV. RESULTS AND DISCUSSION

#### Sample Description

Table 1. Sample Description

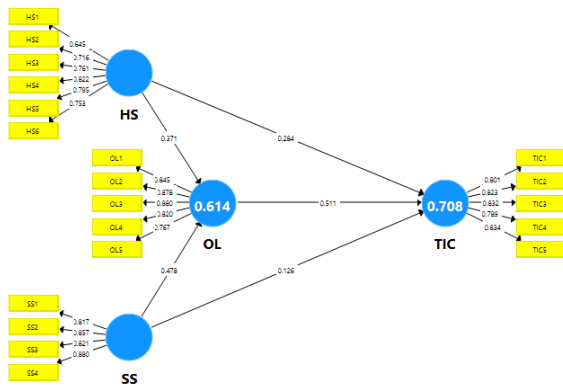
Criteria		Total	%
Age (per October 2019)	< 30 years old	138	20.41%
	30 - 40 years old	315	46.60%
	> 40 years old	223	32.99%
Status of teacher	Public	210	31.07%
	Private	466	68.93%
Years of service	< 5 years	214	31.66%
	5-10 years	328	48.52%
	> 10 years	134	19.82%
Educational level	< S1	54	7.99%
	≥ S1	622	92.01%

#### Results of Validity and Reliability Tests

Measurement model tests include convergent validity, discriminant validity, and composite reliability tests. The results of the PLS analysis can be used to test the hypothesis if all the indicators in the PLS model meet the requirements of convergent validity, discriminant validity, and reliability tests.

#### 1. Convergent Validity Test

Convergent validity test is performed by looking at the loading factor value of each indicator to the construct. For most references, a loading factor of 0.5 or more is considered to have validation that is strong enough to explain latent constructs (Chin, 1998; Hair et al, 2010; Ghozali, 2014). In this study, the minimum acceptable loading factor is 0.5, with the condition that the AVE value for each construct is > 0.5 (Ghozali, 2014).



**Figure 2.** Valid model estimation

Based on the PLS model estimation results in the figure above, all indicators had a loading factor value above 0.5 so that the model met the convergent validity requirements. Apart from looking at the loading factor value of each indicator, convergent validity was also assessed from the AVE value of each construct. The AVE value for each construct was already above 0.5. So the convergent validity of this study met the requirements. The value of items loadings, Cronbach's alpha, composite reliability and AVE of each construct can be seen in Table 2:

**Table 2.** Items Loadings, Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE)

Variables	Items	Loadings	Cronbach's Alpha	Composite Reliability	AVE
Hard Skills (HS)	HS1	0.645	0.838	0.882	0.556
	HS2	0.716			
	HS3	0.761			
	HS4	0.822			
	HS5	0.795			
	HS6	0.753			
Soft Skills (SS)	SS1	0.817	0.857	0.903	0.700
	SS2	0.857			
	SS3	0.821			
	SS4	0.880			
Organizational Learning (OL)	OL1	0.845	0.827	0.881	0.601
	OL2	0.878			
	OL3	0.880			
	OL4	0.820			
	OL5	0.767			
Teacher Innovation Capability (TIC)	TIC1	0.801	0.829	0.880	0.595
	TIC 2	0.823			
	TIC 3	0.832			
	TIC 4	0.789			
	TIC 5	0.834			

## 2. Discriminant Validity Test

A discriminant validity test is carried out to ensure that each concept of each latent variable is different from the other latent variables. The model has good discriminant validity if the AVE squared value of each exogenous construct (the

value on the diagonal) exceeds the correlation between the construct and other constructs (values below the diagonal) (Ghozali, 2014). The results of the discriminant validity test by using AVE squared values or by looking at the Fornell-Larcker Criterion Value can be seen in Table 3:

**Table 3.** Discriminant Validity

Variables	HS	OL	SS	TIC
HS	<b>0.745</b>			
OL	0.685	<b>0.775</b>		
SS	0.631	0.653	<b>0.837</b>	
TIC	0.642	0.749	0.571	<b>0.772</b>

The results of the discriminant validity test in Table 3 showed that all constructs had the AVE square root value above the correlation value with other latent constructs (through the Fornell-Larcker criteria) so that it can be concluded that the model met the discriminant validity.

### 3. Construct reliability test

Construct reliability can be assessed from the value of Cronbach's alpha and composite reliability of each construct. The recommended composite reliability and Cronbach's alpha values are more than 0.7. (Ghozali, 2014). The reliability test results in table 2 above showed that all constructs had composite reliability and Cronbach's alpha values of greater than 0.7 (>

0.7). So it can be concluded that all constructs met the required reliability.

### Hypothesis testing

Hypothesis testing in PLS is also called the inner model test. This test includes a test of the significance of direct and indirect effects and measurement of the influence of exogenous variables on endogenous variables. To know the influence of tacit knowledge and hard skills sharing on organizational learning and teacher innovation capability, a direct influence test is needed. The direct effect test was performed by using the t-statistic test in a partial least squared (PLS) analysis model with SmartPLS 3.0 software. By using the bootstrapping technique, R Square values and significance test values were obtained as follows:

**Table 4.** R Square Value

	R Square	R Square Adjusted
TIC	0.602	0.601
OL	0.526	0.526

**Table 5.** Hypotheses Testing

Hypotheses	Relationship	Beta	SE	T Statistics	V-Values	Decision
H1	HS -> TIC	0.284	0.043	6.652	0.000	Supported
H2	SS -> TIC	0.126	0.040	3.198	0.001	Supported
H3	HS -> OL	0.371	0.037	9.957	0.000	Supported
H4	SS -> OL	0.478	0.035	13.822	0.000	Supported

H5	OL -> TIC	0.511	0.047	10.955	0.000	Supported
H6	HS -> OL -> TIC	0.190	0.029	6.440	0.000	Supported
H7	SS -> OL -> TIC	0.244	0.026	9.327	0.000	Supported

Based on Table 4 above, the value of R Square of OL was 0.526 which means that organizational learning (OL) was explained by hard skills (HS) and soft skills (SS) variables by 52.6%, while the remaining 47.4% was explained by other variables not discussed in this study. Meanwhile, the value of R Square of teacher innovation capability (TIC) was 0.602 which means that the teacher innovation capability variable was explained by hard skills, soft skills and organizational learning by 60.2%, while the remaining 39.8% was explained by other variables not discussed in this study. Table 5 shows T Statistics and P-Values which show the influence between variables.

### Discussion

Based on the results of the study, hard skills sharing had positive and significant influence on teacher innovation capability, both direct effects and mediating effects of organizational learning. This shows that the better hard skills possessed by teachers, the teacher innovation capability of individuals in a school will also increase. This is in line with a study on business organizations by Perez-Luno et al (2018), Terhorst et al (2018), Boadu et al (2018), Che et al (2019). Soft skills had a significant and positive influence on teacher innovation capability, both direct effects and the mediating effect of organizational learning. This shows that the better soft skills possessed by teachers, the teacher innovation capability will also increase. In addition, it can be concluded that organizational learning was a mediator between teacher soft skills and teacher innovation capability.

This study concluded that hard skills and soft skills had a positive and significant influence on organizational learning. This shows that the better the hard skills and soft skills possessed by teachers, the more positive the formation and development of

organizational learning in a school. This is in line with a study by Qi & Chau (2018) on business organizations. It also showed that the rarest and most valuable resources in the digital age are not ordinary and mediocre teachers, but teachers who can create new ideas and innovations (Xu, David & Kim, 2018). Teachers play a key role in producing and reusing knowledge and intellectual property through education and teaching (Al-Kurdi, El-Haddadeh & Eldabi, 2018). For this reason, the scarcity of teachers who have adequate hard skills and soft skills can inhibit the power of innovation, competitiveness, growth, and flexibility of a school. In the future, the talent and response of teachers in improving hard skills and soft skills will be an important factor in the future of the nation's education. Teachers with skills and innovation will be the capital and instrument of civilization.

Several studies concluded that soft skills had a greater influence on innovation than hard skills (Ibrahim, Boerhannoeddin & Bakare, 2017; Albandea & Giret, 2018; Viviers, Fouche & Reitsma, 2016; Escrig-Tena et al, 2018). However, this study showed that hard skills had a greater influence on teacher innovation capability. One of the rational reasons is that research respondents were in big cities, namely in Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek).

Based on the results of the study, organizational learning had positive and significant influence on teacher innovation capability. Organizational learning was mediating the influence of hard skills and soft skills on teacher innovation capability. This is in line with a study by Martinez-Costa (2018). This study also concluded that a school can manage past experiences to be combined with the current hard skills and soft skills of teachers. In essence, organizational learning could provide positive conditions in the process of knowledge creation in the 4.0 era.



## V. CONCLUSIONS AND SUGGESTIONS

### Conclusions

To add the role of soft skills as a predictor of teacher innovation capability, a school needs to provide autonomy and concession to share knowledge with teachers. Therefore, a school needs to create organizational learning as a positive environment that stimulates teacher competence and engagement. Knowledge management will be effective if the individual performance of each teacher is in good condition (Manaf et al, 2017). Researchers continue to learn about knowledge as an important school resource. It can be said that skills, both hard skills and soft skills, can significantly improve school performance. Organizational learning transforms individual knowledge into school knowledge. This study concluded that organizational learning could be a catalyst for knowledge creation in teachers in schools. In fact, the teacher has an obligation to prepare students to study and work in a knowledge society.

### Managerial Implications

Based on the conclusion, school management needs to build maximum involvement of all teachers to continuously improve hard skills and soft skills. Teacher training in each section of the school is a necessity with a level of intensity and context that is adjusted to the key performance indicators of each teacher. In essence, team learning behavior created in the school environment will be a driving force for teacher innovation (Widmann & Mulder, 2018).

The process of improving skills to improve teacher innovation capability should not be limited to the internal processes of schools. However, school management needs to expand the process of innovation development through efforts to absorb, articulate, utilize and manage knowledge sourced from external school partners such as parents, government, community, and other educational institutions. School management can activate learning from others when assigning their teachers to attend training, seminars, workshops, to visit other schools, meet with school committees and other strategic partners. Because external knowledge, such as those from trainers, coaches, parents, government,

communities, and other educational institutions, supports teacher innovation capability.

In addition, commitment to learning and seriousness to be involved in managing the learning environment are things that need attention. Because school education institutions can become organizational learning when all members of the school educational institutions feel that they enjoy the learning process. The learning process becomes a school culture that encourages innovation (Asbari, Santoso & Purwanto, 2019). Key factors of organizational learning are trust, open communication, high involvement, the presence of industry challenges, and a creative work atmosphere. The task of school management is to facilitate the fulfillment of these key factors.

### Limitation

This study had several limitations. First, this study analyzed the influence of hard skills and soft skills on teacher innovation capability of teachers, both direct and indirect through organizational learning variables. Because there will be several other variables that influence teacher innovation capability, the researchers strongly recommend to find, explore and analyze them. Secondly, this study was conducted in a school environment and may not be generalized to other industries. Therefore it is highly recommended that further studies can be performed on this topic in other industries.

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