

## **Trust Me in Team Work! Study of The Influence of Knowledge Sharing on Team Effectiveness with Virtual Team Trust as a Moderator**

Kurrota A'yuni<sup>a</sup> and Endang Parahyanti<sup>b</sup>

*<sup>a</sup>Faculty of Psychology, Universitas Indonesia, Depok, Indonesia; <sup>b</sup>Department of Industrial and Organizational Psychology, Faculty of Psychology, Universitas Indonesia, Depok, Indonesia*

\*Corresponding author:

Endang Parahyanti

Department of Industrial and Organizational Psychology

Faculty of Psychology, Universitas Indonesia

Depok, Jawa Barat, Indonesia

Email address: [parahyanti@gmail.com](mailto:parahyanti@gmail.com)

## **Trust Me in Team Work! Study of The Influence of Knowledge Sharing on Team Effectiveness with Virtual Team Trust as a Moderator**

**Abstract**—This study examined the potential influence of knowledge sharing on team effectiveness with virtual team trust as a moderating variable. Over the last five years, the growth of the internet has been significant in Indonesia, and most people currently have access to and are regularly using this technology. Chat is the most commonly used access service, which greatly facilitates communication and information sharing within groups, which is why many people and organizations use it to help coordinate teamwork. Virtual teams work together using computer technology to overcome the limitations of distance and time. Developing a virtual team requires that members overcome significant challenges related to trust in order to achieve team effectiveness. In addition, knowledge sharing is another factor that can influence team effectiveness. In this study, researchers explored the relationship between these variables. Each variable was measured with a survey for which participants were asked to answer several items about all variables according to their experiences when working in teams. Data collection was conducted by having respondents fill out questionnaires online and offline. The sampling technique was non-probability sampling with the accidental sampling method with specified criteria, and data analysis was conducted using SPSS & Process. Our results show that with virtual team trust as a moderator, the interaction between knowledge sharing has a significant influence on the level of team effectiveness. The findings demonstrate that virtual team trust has a role in minimizing or increasing the influence of knowledge sharing on team effectiveness, such that the more people believe in the group, the less people engage in knowledge sharing and vice versa.

**Keywords:** knowledge sharing, team effectiveness, team trust, teamwork, virtual team trust

### **Introduction**

In the current era, the development of technology has been occurring at a rapid pace, which can have varying effects on its users. The influence of technology can be seen as a double-sided blade that can create positive or negative effects. To minimize the latter, users must be able to utilize technology according to its functions. The internet has become a primary necessity for many people to support their lives. Over the last five years, internet development has proceeded rapidly in Indonesia. Based on a survey conducted by the Internet Service Provider Association (Asosiasi Penyelenggara Jasa Internet Indonesia, 2017) the number of internet users in Indonesia in 2013 totaled 82 million people, whereas by 2017, that number had grown to 143.26 million people, or 54.68% of the total population of Indonesia ( $n = 262$  million). Internet use in the country is largely dominated by people aged 19-34 years, who amount to 49.52% of internet users, and among available access services, chat is most often used, with a total usage of 89.35% among internet users.

Based on the aforementioned and related data, it can be seen that with the development of internet technology, most Indonesian people have attained ease of obtaining information and engaging in communication. Such conditions facilitate cohesion among group members. Virtual teams are formed to be enable people to working together in a manner such that the utilization of computer technology transcends the limitations ordinarily imposed by distance and time (Ebrahim, Ahmed, & Taha, 2009). Using computer technology allows teams to work together via email, video conferences, voice conferences and other methods. Virtual teams have been used by companies since 2000 (Hoch and Kozlowski, 2014), and as indicated above, they are formed to overcome differences in distance and time that can hamper coordination among the tasks of each group member. With the formation of a virtual team, each group member can optimize the time they have to complete their task by accessing the group without having to meet face to face with other team members, which can support the team's effectiveness in achieving its targets. However, in their development, virtual teams face a significant challenge in the dimension of trust, as the differences in distance and time mean that each team member must have trust in other members in order to effectively collaborate in completing their tasks.

Trust is very important because its presence can lead to team success, which in turn functions as a predictor of organizational success. According to Mayer, Davis, and Schoorman (1995), trust is conceptualized as the willingness of individuals to be vulnerable to the actions of other parties, who might carry out certain actions beyond the expectations of those who believe in them regardless of the individual's ability to monitor and control others. Simply put, trust is the construction of a dyadic relationship between the trustor and the trustee (Mayer et al., 1995). According to De Jong and Elfring (2010), team trust is a situation that arises due to collective understandings among team members regarding perceptions, attitudes and shared experiences. Similar to Mayer et al. (1995), Breuer, Huff Meier, and Herten, (2016) described team trust as a common desire of team members who are willing to be vulnerable to the actions of other team members with a shared expectation that other team members will implement actions that are important and beneficial to the team, regardless of how individuals can monitor or control others. They assumed that team trust can facilitate risk-taking behavior by reducing diversity control, engaging in open discussions about conflicts and mistakes, jointly providing feedback, and sharing confidential information, which ultimately leads to more efficient coordination of members' resources (e.g., time, effort, knowledge) to facilitate teamwork. Costa (2003) defined team trust as a multidimensional construct comprised of four factors, namely propensity to trust, perceived trustworthiness, cooperative behavior, and monitoring behavior. According to Costa and Anderson (2011), propensity to trust is the desire of individuals or groups to trust others, whereas perceived trustworthiness refers to the extent to which an individual hope for others to behave according to their own demands. Furthermore, the dimension of cooperative behavior is defined as the extent to which team members rely on each other, communicate openly about their work or themselves, receive influences from each other, and personally engage with the team. Finally, monitoring behaviors denotes the actions of individuals to control the work of other members by checking and surveilling. Costa and Anderson's (2011) trust construct was used for the current study, which accords with their measurement of trust as multidimensional variable.

As described in the preceding paragraph, Breuer et al. (2016) proposed that trust can increase team effectiveness by increasing certain risk-taking behavior among team members. Effectiveness is a measure of what is produced by individuals and teams. Hackman (as cited in Costa, 2003) asserted that effectiveness must measure the output of the team; it is a group condition that describes the performance of the unit, although the impact on the group is based on individual experiences. Researchers usually assess effectiveness by measuring the dimensions of members' performance and attitudes toward a team or organization (Cohen and Bailey, 1997). Costa (2003) measured effectiveness based on perceived task performance, team satisfaction, and organizational commitment, such that team performance can be measured from the points of view of team members, who have the best knowledge or understanding of how well the team is performing tasks related to their goals. Luray and Raisinghani (2000) suggested that team effectiveness consisted of three basic criteria, namely a team's productivity level, its ability to learn and improve, and team satisfaction. Productivity refers how well the product or output meets the required standards, whereas the ability to learn relates to the degree to which individuals and teams can learn and improve themselves in the process of performing their work. Satisfaction denotes each member's satisfaction with the team, as in addition to achieving the goals of the team, the team also has the responsibility of providing opportunities for the development and growth of individual members. However, Pangil and Chan (2014) argued that team effectiveness is a subjective term that is difficult to define and measure. Virtual teams are different from conventional teams; however, the performance expectations of the organization are the same for both. For this reason, the effectiveness of the virtual team can be measured through the performance and satisfaction of the team members.

Research on the relationship between trust and team effectiveness has yielded varying results, as some have found a positive relationship between team trust and team effectiveness (De Jong and Elfring, 2010), whereas others have identified no relationship or even a negative relationship between team trust and team effectiveness. (Hertel, Konradt & Orlikowski, 2004). The latter results can occur because often, the trust in the work team becomes less clear (Breuer et al., 2016). Kanawattanachai and Yoo (2007) proposed that an effective team must consist of members who are sharing knowledge with each other. Ideally, working in a team enables its members to develop the knowledge and other resources needed to complete their work (Pangil and Chan, 2014).

As discussed above, knowledge sharing can be a significant predictor of team effectiveness. Knowledge is an important resource, as the knowledge possessed by individuals as a whole can be used to complete tasks through their abilities and skills (Alsharo, Greeg, & Ramirez, 2016; Pangil and Chan, 2014). Staples and Webster (2008) conceptualized knowledge sharing as an exchange whereby one party shares their knowledge (explicit or tacit) with another party (someone or repository). According to Van Den Hoof and De Ridder (2004), knowledge sharing is a two-way process that involves individuals exchanging knowledge (tacit/explicit knowledge) and creating new knowledge together, which implies that every knowledge-sharing behavior consists of bringing or contributing knowledge and gaining or gathering knowledge (De Vries, Van Den Hoof & De Ridder, 2006). Although informed by all of the definitions elucidated above, the current study applied that proposed by Staples and Webster (2008). Having

knowledge is advantageous for organizations amidst ongoing competition; therefore, it is important for organizations to be able to manage knowledge by encouraging individuals to share their knowledge with others. Usually, members working in an environment that has built up a sense of trust will believe that they will benefit by when collaborating by both giving and receiving assistance. Furthermore, Staples and Webster (2008) argued that when individuals in a team trust each other, they believe that other people are willing and able to share their knowledge, which instills in them an obligation to share.

In the past few years, members of many organizations have begun to use virtual media for collaborating. Usually, a virtual team is formed to enable an organization to combine individual expertise deriving from different places, which allows the exchange of knowledge between individuals to confer competitive advantages. An empirical study by Lee, Gillespie, Mann and Wearing (2010) found that knowledge sharing has a significant effect on group performance. These results are supported by research conducted by Staples and Webster (2008), who found that knowledge sharing can affect team effectiveness.

When working together, it is very important for each member to build an environment of mutual trust with other members. When a trusting environment is formed, each member tends to believe that their behavior will produce beneficial consequences for themselves because other people can collaborate with them and are willing to provide assistance (Pangil and Chan, 2014). When they have developed trust among each other, team members feel that they can also engage in knowledge sharing with others, which ultimately enhances team effectiveness. Kim and Ko (2014) proposed that trust can act as a moderating variable on knowledge sharing relationships with human resource practices. This indicates that trust can not only serve as an independent variable but can also be a moderator variable, which can thereby either weaken or strengthen the influence of knowledge sharing on team effectiveness.

## **Methods**

### **Research Design and Procedures**

This research utilized quantitative methods in the form of a cross-sectional design. The data were collected using an adapted questionnaire for all variables. All questionnaires were answered by selecting one of the numbers arranged into an interval scale. Completion of this survey is divided into two parts, namely paper-based and online. Invitations to complete the online surveys were sent via online messaging and posted on various social media. The number of participants who filled out with paper-based questionnaires totaled 49 people and 31 participants completed the online version. In addition, the researchers also provided general information of the study and the confidentiality of the data, and each respondent gave informed consent to participate in the study.

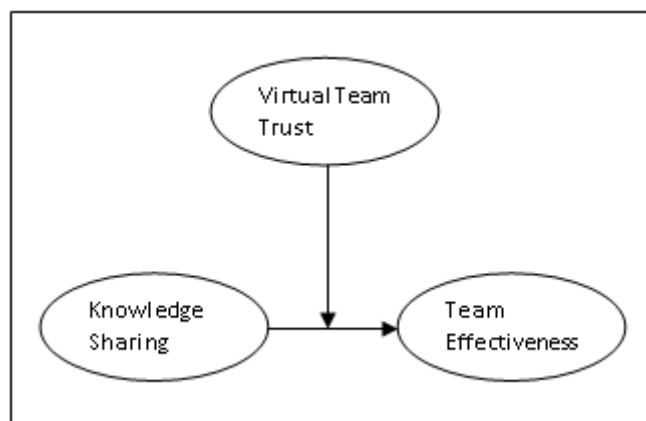


Fig. 1. Proposed influence of knowledge sharing toward team effectiveness with virtual team trust as variable mediator

### Measurement Instruments

To measure the variables related to virtual team trust, the researchers adapted the scale developed by Costa and Anderson (2011), which consists of 21 items with a reliability value of  $\alpha.76$  and are scored using a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). To measure knowledge sharing, the researchers adapted the scale developed by Staples and Webster (2008), which consists of five items with a reliability value of  $\alpha.86$  and was scored along a scale ranging from 1 (strongly disagree) to 4 (strongly agree). Finally, the team effectiveness measure adapted the scale from Luray and Raisinghani (2000), which consists of eight items scored along a scale ranging from 1 (strongly disagree) to 4 (strongly agree).

### Data Analysis

The model illustrated in Fig. 1 was analyzed using the moderation analysis of Hayes model 1 and processed using Process on SPSS. This statistical analysis method was selected based on the goals for this study. The researchers did not do a detailed analysis as can be achieved using the Bayesian method; the method was chosen for its ability to test moderation models, as well as its ease of use, which facilitates the ability to read the results of calculations, which can then be interpreted based on the theory used to inform the study. The hypothesized model was evaluated based on the computed values and evidence from confidence intervals.

### Participants

Subjects in this study were chosen based on the criterion that they had been a member of a group working on the task of constructing psychology measuring instruments. This criterion was chosen in order to be able to ensure that each participant had the same goal and to control the length of interaction in the group. In addition, participants also had to have used virtual media for working on these tasks (for example, using email, call conferences, and chatting). The sampling technique was non-probability sampling with the accidental sampling method. In addition, participants were individuals who were easily accessible by researchers (Kerlinger and Lee, 2000). The recruited participants consisted of 80 university students that met the specified criteria.

## Results

### Descriptive Statistics and Correlations

The descriptive analysis provides the means and standard deviations for each variable, whereas correlation analysis provides an overview of how strong the relationships are between variables. These results can be seen in Table I.

Table I. Mean, Standard Deviation, and Correlation

	M	SD	1	2	3
1	3.194	0.474	1.00		
2	3.277	0.465	0.737**	1.00	
3	5.327	0.748	0.526**	0.552**	1.00

- a. 1. Team Effectiveness, 2. Knowledge Sharing, 3. Team Trust  
b. \*\*Correlation is significant at the 0.01 level (1-tailed).

### Moderation Analysis

In this study, the researchers adapted the measuring instruments for each variable from previous studies. Before processing the results of further research the researchers calculated the reliability and validity of the adapted measuring instruments. The reliability test results for each measuring instrument used obtained a value of Cronbach's Alpha > 0.8, including a value of  $\alpha = 0.89$  for the virtual team trust measure, a value of  $\alpha = 0.87$  for the knowledge sharing measure, and a value of  $\alpha = 0.88$  for the team effectiveness measure. Validity is seen through the R-values in the corrected item-total correlations and comparing it with the R table value of 0.361 (Table II). All items of the knowledge sharing and team effectiveness variables had a value of  $r > 0.3$ , whereas eight items of the virtual team trust variables had a value of  $r < 0.3$ ; therefore, these were not included in the analysis, and the virtual team trust variables were represented by 12 items in the analysis. The elimination of items was done by removing items one by one and looking at items with a value of  $r < .3$  to determine the smallest of the r values produced.

The results of this study can be seen through the coefficient of knowledge sharing:  $b_1 = 0.7074$  has a p-value of  $< 0.05$ , CI (0.53 - 0.89), which demonstrates that knowledge sharing has a significant influence on team effectiveness. Furthermore, the virtual team trust variable has a coefficient value of  $b_2 = 0.0482$ ,  $p > 0.05$ , CI (-0.68 - 0.16), which shows that the virtual team trust does not have a significant influence on team effectiveness. The interaction between knowledge sharing and virtual team trust has a coefficient of  $b_3 = -0.281$ ,  $p < 0.05$ , CI (-0.47 - -0.90), which means that the interaction of knowledge sharing and virtual team trust has a significant influence on the variety of team effectiveness. This confirms that in the model, virtual team trust only has a role as a moderator variable.

Next, in Table III, it can be seen that the influence of knowledge sharing on team effectiveness is stronger when virtual team trust is a low-value moderator variable and vice versa. This shows that individuals will be more open and provide more knowledge sharing to other members to enhance team effectiveness when they do not trust their team to reach the target group. This is



because each individual wants to be able to achieve this target by issuing an extra effort by engage in knowledge sharing.

Table II. Result of Statistic Analysis for Influence of Knowledge Sharing Toward Team Effectiveness with Virtual Team Trust as a Mediator Variable

		<b>Coeff</b>	<b>SE</b>	<b>t</b>	<b>p</b>	<b>CI</b>
<b>Intercept</b>	i <sub>1</sub>	3,247	0,04	84,87	0,00	3,17 – 3,32
<b>Knowledge Sharing (X)</b>	b <sub>1</sub>	0,707	0,09	7,81	0,00	0,53 – 0,89
<b>Virtual Team Trust (M)</b>	b <sub>2</sub>	0,048	0,06	0,83	0,41	-0,68 – 0,16
<b>Interaction (XM)</b>	b <sub>3</sub>	-0,281	0,10	-2,93	0,00	-0,47 – -0,90

<sup>a</sup>  $R^2 = 0,6075$ ,  $MSE = 0,0916$

<sup>b</sup>  $F(3,276) = 39,2130$ ,  $p < 0,05$

Table III. Conditional Effect of X on Y at Values of the Moderator.

<b>Team Trust</b>	<b>Effect</b>	<b>SE</b>	<b>t</b>	<b>p</b>	<b>CI</b>
-0,748	0,918	0,124	7,409	0,000	0,671 – 1,164
0,000	0,707	0,091	7,812	0,000	0,527 – 0,888
0,748	0,497	0,107	4,662	0,000	0,285 – 0,709

The role of virtual team trusts as a moderator variable on the influence of knowledge sharing on team effectiveness is also illustrated in Fig. 2.

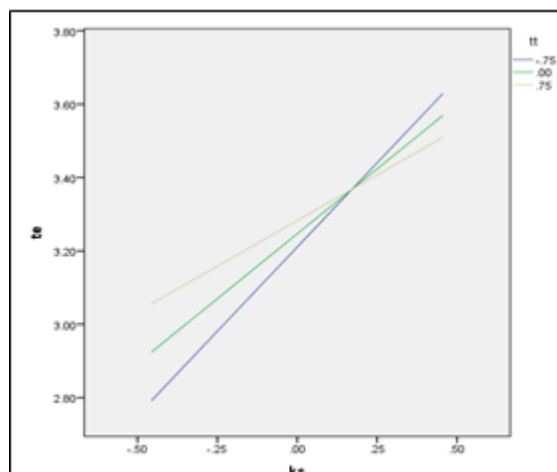


Fig. 2. Result for conditional effects of x on y at moderator values



## Discussion and Conclusion

The goal of this study was to extend understanding of the influence of knowledge sharing on team effectiveness with virtual team trust as a moderator variable, and the study aimed to answer the question: can team trust be a moderator variable on the influence of knowledge sharing on team effectiveness? In order to answer this question, a model was being proposed (Fig. 1). The result indicates a significant influence of knowledge sharing on team effectiveness with a virtual team trust as a moderator.

In a virtual team, trust is critical to successful collaboration. In this study, researchers obtained significant results concerning the relationship between virtual team trust and knowledge sharing and the role of virtual team trust as a moderator on the influence of knowledge sharing on team effectiveness. However, this research did not find an influence of virtual team trust on team effectiveness. This result aligns with research by Alsharo et al., (2016, pp. 479–490), who also found that trust did not have a direct relationship with team effectiveness. The theoretical implications of this research are that a person's trust in their team can influence knowledge sharing to achieve greater team effectiveness. From a practical perspective, this study found that members' trust is important to achieve team effectiveness, except that trust also has an influence when interacting with knowledge sharing, which is a predictor of team success.

A suggestion for future research is to increase the number of participants and controls such that participant characteristics are matched with the variables, particularly those related to the virtual team, which may provide broader results. In addition, future research should employ a virtual team trust measuring instrument that has better validity to improve the results.

## References

- Alsharo, M., Gregg, D., & Ramirez R. (2016). Virtual team effectiveness: The role of knowledge sharing and trust. *Information & Management*, 54(4), 479–490. doi: <http://dx.doi.org/doi:10.1016/j.im.2016.10.005>.
- Asosiasi Penyelenggara Jasa Internet Indonesia (2017). *Infografis Penetrasi dan Perilaku Pengguna Internet Indonesia*. Retrieved from <https://apjii.or.id/survei2017>
- Breuer, C., Huffmeier, J., & Hertel G. (2016). Does Trust Matter in Virtual Teams? A Meta-Analysis of Trust and Team Effectiveness Considering Virtuality and Documentation as Moderators. *Journal of Applied Psychology*, 101(8), 1151–1177.
- Costa, A. C. (2003). Work team trust and effectiveness. *Personnel Review*, 32(5), 605–622. doi: <http://doi.org/10.1108/00483480310488360>.
- Costa, A. C., & Anderson, N. (2011). Measuring trust in teams: Development and validation of a multifaceted measure of formative and reflective indicators of team trust. *European Journal of Work and Organizational Psychology*, 20(1), 119–154.
- De Jong, B. A., & Elfring, T. (2010). How does trust affect the performance of ongoing teams? The mediating role of reflexivity, monitoring, and effort. *Academy of Management Journal*, 53(3), 535–549. doi: 10.5465/AMJ.2010.51468649
- De Vries, R. E., Van den Hooff, B., & De Ridder, J. A. (2006). Explaining knowledge sharing: The role of team communication styles, job satisfaction, and performance beliefs. *Communication research*, 33(2), 115–135.

- Ebrahim, N.A., Ahmed, S., & Taha, Z. (2009). Virtual R&D teams in small and medium enterprises: A literature review. *Scientific Research and Essays*, 4(13), 1575–1590.
- Hertel, G., Konradt, U., & Orlikowski, B. (2004). Managing distance by interdependence: Goal setting, task interdependence, and team-based rewards in virtual teams. *European Journal of work and organizational psychology*, 13(1), 1-28.
- Hoch, J. E., & Kozlowski, S. W. (2014). Leading virtual teams: Hierarchical leadership, structural supports, and shared team leadership. *Journal of Applied Psychology*, 99, 390–403.
- Kanawattanachai, P. & Yoo, Y. (2007). The impact of knowledge coordination on virtual team performance over time. *MIS Quarterly*, 31(4), 783–808.
- Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioral research*. Belmont, Calif.: Wadsworth.
- Kim, Y. W., & Ko, J. (2014). HR practices and knowledge sharing behavior: Focusing on the moderating effect of trust in supervisor. *Public Personnel Management*, 43(4), 586-607.
- Lee, P., Gillespie, N., Mann, L., & Wearing, A. (2010). Leadership and trust: Their effect on knowledge sharing and team performance. *Management learning*, 41(4), 473–491.
- Lurey, J. & Raisinghani, M. (2000). An empirical study of best practices in virtual teams. *Information and Management*, 38(8), 523–544.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An Integrative Model of Organizational Trust. *The Academy of Management Review*, 20(3), 709–734.
- Pangil, F. & Chan, J. M. (2014). The mediating effect of knowledge sharing on the relationship between trust and virtual team effectiveness. *Journal of Knowledge Management*, 18(1), 92–106.
- Staples, D. S., & Webster, J. (2008). Exploring the effects of trust, task interdependence and virtualness on knowledge sharing in teams. *Information Systems Journal*, 18(6), 617-640.
- Van den Hooff, B. & De Ridder, J.A. (2004). Knowledge sharing in context: the influence of organizational commitment, communication climate and CMC use on knowledge sharing. *Journal of Knowledge Management*, 8(6), 117–130.