

Impact of Virtual Teams on Supervisor-Subordinate Guanxi (SSG): Case Study on Jiangsu Hengli Group

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ABSTRACT

Based on the Social Exchange Theory, this study's aim was to investigate the impact of virtual teams on supervisor-subordinate guanxi (SSG) in the textile industry, using the Jiangsu Hengli Group as a case study. A sample of 150 participants from 24 virtual teams at the company participated in the study. The results did not support our theoretical hypothesis that SSG is positively related to team performance in virtual teams. In contrast, the hypothesis that inadequate communication would have a negative impact on SSG was accepted. However, the hypothesis that low trust would have a negative impact on SSG was rejected. The findings provided empirical evidence that although Guanxi may not directly impact team performance in virtual teams, it still plays an important role in building strong relationships between supervisors and subordinates, which are essential for effective team functioning. These findings support the Social Exchange Theory and have practical implications for organizations that rely on virtual teams, emphasizing the need to focus on effective communication to promote positive SSG.

KEYWORDS: virtual teams, supervisor-subordinate guanxi, team performance, social exchange theory

1. INTRODUCTION

The concept of virtual teams in conjunction with the supervisor-subordinate guanxi (SSG) is a growing area of research following the increasing integration of virtual teams in contemporary workplaces. Guanxi is a Chinese concept that refers to individuals' relationships and networks with others in their social and professional lives (Liu, 2018). SSG, on the other hand, refers to the relationship between a supervisor and subordinate in a work setting. This relationship is considered important for the organization's success as it can affect the employee's job satisfaction, commitment, and performance.

Virtual teams, also known as distributed teams, are composed of individuals who work together across time and geographical boundaries through technology (Guan & Frenkel, 2018). These teams are becoming more common in organizations since they are continually linked to increased productivity, flexibility, and access to a wider pool of talent. Nevertheless, virtual teams also present challenges

for building and maintaining SSG, as communication and trust can be more difficult to establish in a virtual setting. Previous studies have shown that communication is crucial in developing and maintaining SSG in virtual teams (Salman et al., 2022). In virtual teams, communication is often asynchronous and less frequent, leading to misunderstandings and a lack of trust between team members. Furthermore, virtual teams often have a diverse membership, leading to cultural differences and language barriers that further complicate communication.

Trust is another important factor that affects SSG in virtual teams. Trust in virtual teams can be more difficult to establish than in face-to-face teams due to the lack of nonverbal cues and the difficulty building personal relationships. Moreover, Salman et al. (2022) claimed that virtual team members might be less likely to trust each other because they have less information about their team members and less

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opportunity to interact with them. Cultural differences can also affect SSG in virtual teams. Different cultures can have different values, norms, and communication styles, leading to misunderstandings and conflicts in virtual teams (Guan & Frenkel, 2018). Additionally, virtual teams can have members from different countries, leading to time zone differences and difficulty in scheduling meetings.

Despite the increasing use of virtual teams in organizations, there needs to be more empirical evidence of the impact of these teams on the development and maintenance of SSG. The relationship between a supervisor and subordinate is crucial for the organization's success, as it can affect the employee's job satisfaction, commitment, and performance (Chung & Huang, 2021). However, the unique characteristics of virtual teams, such as asynchronous and less frequent communication, cultural differences, and lack of trust, present challenges for building and maintaining SSG. The problem is that the relationship between a supervisor and subordinate can be negatively impacted in a virtual team setting. Thus, the present study aims to investigate, through an empirical approach, the impact of virtual teams on SSG and identify strategies for building and maintaining SSG in virtual teams by collecting and analyzing data from virtual teams in organizations.

The present study makes several important contributions to the existing literature. First, we examine the unique challenges and opportunities presented by virtual teams. Second, we contribute to the growing body of research on the role of interpersonal relationships in virtual teams and highlight the complexity of these relationships in virtual contexts. Providing practical implications for organizations that are looking to implement or improve virtual teams in their operations.

2. Literature Review

2.1. Social Exchange Theory

The theoretical framework for this study is based on Social Exchange Theory. According to this theory, social exchange occurs when individuals engage in mutually beneficial interactions that result in positive outcomes for both parties involved (Cropanzano & Mitchell, 2016). In virtual teams, the social exchange between supervisors and subordinates is crucial to developing supervisor-subordinate guanxi (SSG).

Virtual teams can impact SSG in several ways. Wang et al. (2021) explained that virtual teams can create barriers to communication, reducing the frequency and quality of interactions between supervisors and subordinates. This can lead to decreased trust, reduced collaboration, and weaker SSG. Conversely,

Gao (2018) argued that virtual teams can also enhance SSG by providing opportunities for supervisors and subordinates to engage in frequent and diverse interactions, leading to increased mutual understanding and stronger relationships.

Therefore, seen through the lens of the Social Exchange Theory, this study seeks to fill a knowledge gap in the existing literature by examining the unique challenges and opportunities presented by virtual teams and highlight effective means to manage and maintain SSG.

2.2. Virtual Teams, SSG and Impact on Team Performance

Supervisor-subordinate guanxi (SSG), or the relationship between a supervisor and their subordinate, has been extensively studied in the context of traditional work teams. Recent studies have indicated that SSG can significantly impact team performance, as strong relationships between supervisors and subordinates can lead to increased trust, collaboration, and motivation. However, Haque et al. (2022) observed that with rise of virtual teams, the impact of SSG on team performance in virtual settings is increasingly becoming an area of interest. Virtual teams, characterized by distributed membership, asynchronous communication, and limited face-to-face interaction, present unique challenges for building and maintaining SSG. Despite these challenges, SSG can still play a crucial role in virtual team performance.

Empirical studies on the topic of virtual teams and SSG are relatively scarce. Some of the studies have mainly used qualitative methods, such as case studies and interviews, to explore the impact of virtual teams on SSG. A few studies have used quantitative methods, such as surveys, to examine the relationship between virtual teams and SSG. For example, Wang et al. (2021) utilized a quantitative research approach to investigate virtual teams' impact on SSG. The study used a sample of 312 employees from a Chinese state-owned enterprise and found that virtual teams harmed SSG. In the same vein, Gao et al. (2020) conducted another empirical research whose primary purpose was to investigate the impact of virtual teams on SSG, and the strategies organizations can use to build and maintain SSG in virtual teams. The study used a sample of 24 virtual teams from a Chinese state-owned enterprise and, also found that virtual teams harmed SSG. Studies have found that SSG can positively impact virtual team performance by promoting trust and communication, which in turn can increase collaboration, motivation, and satisfaction. For example, a study conducted by Liu et al. (2018) used an experimental design to examine the

impact of virtual teams on SSG and found that virtual teams adversely affected SSG compared to face-to-face teams, associating trust and communication in virtual teams with higher levels of team performance.

Critically analyzing the above, SSG and team performance in virtual teams build on two concepts. First, strong relationships between supervisors and subordinates creates prosocial motivation by increasing the emotional investment of their subordinates. Second, virtual teams are aimed at boosting output, adaptability, and access to a larger talent pool. Considering its nature, it poses multiple challenges, such as, asynchronous, and less frequent communication, cultural differences, and language barriers.

Therefore, given the evidence in the literature and the above arguments, it is expected that a positive relationship between SSG and team performance will be observed.

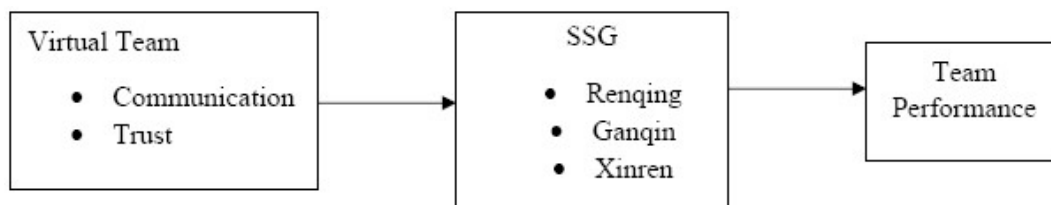
Hypothesis 1: SSG is positively related to the team performance in virtual teams

2.3. Communication and Trust on SSG in the Contexts of Virtual Team

The literature on the impact of communication and trust on supervisor-subordinate guanxi (SSG) in virtual teams is extensive. Many studies have shown that the effectiveness of virtual teams is highly dependent on the quality of communication and trust between team members, including supervisors and subordinates (Wang et al., 2021; Gao et al., 2020). In the same vein, Gudergan et al. (2020) claimed that virtual teams often face communication challenges due to a lack of face-to-face interaction, time zone

2.4. Research Model

The conceptual framework of this study is shown below to illustrate the interconnections between the different variables.



3. Methodology

3.1. Research Approach

A sample of 150 members from 24 virtual teams at Jiangsu Hengli Group participated in the study. The study used a self-administered questionnaire to gather data. The questionnaire included items measuring communication satisfaction, trust, and SSG, such as "I feel comfortable discussing problems with my supervisor in this team" and "I trust my supervisor in this team." In addition, items were also included to measure team performance, such as "I feel that the performance of my virtual team is better than a co-located team." and "I am satisfied with the performance of my virtual team" (see the questionnaire in appendix).

The collected data was analyzed using descriptive statistics such as means and standard deviations, as well as inferential statistics such as correlation and regression analysis, to examine the relationship between virtual teams and SSG, communication and trust and team performance.

differences, and language barriers. These challenges can lead to decreased trust between supervisors and subordinates, negatively impacting SSG (Liu, 2018). In virtual teams, trust is critical for building strong relationships and establishing a sense of cohesion and collaboration. When trust is low, supervisors and subordinates are less likely to engage in open and effective communication, and this can weaken SSG. In addition, cultural differences were found to have a big impact on SSG in virtual teams Gao et al. (2020).

In virtual teams, communication is also critical for maintaining transparency and accountability. Haque et al. (2022) explained that inadequate communication can result in misunderstandings and miscommunication, leading to decreased trust and weaker SSG. Moreover, virtual teams often rely on technology to facilitate communication, and technology can also introduce new challenges and obstacles, such as technical difficulties and a lack of personal connection.

Therefore, given the evidence in the literature and the above arguments, communication and trust can be considered as critical components of positive SSG in virtual teams and that any challenges or barriers to communication and trust can lead to weakened relationships between supervisors and subordinates. As such, it is reasonable to argue that inadequate communication and low trust are negatively related to SSG in virtual teams

Hypothesis 2: Inadequate communication will have a negative impact on SSG in virtual teams

Hypothesis 3: Low Trust will have a negative impact on SSG in virtual teams

3.2. Variable Measurements

3.2.1. Measurement of the Variables

Measuring supervisor-subordinate guanxi was achieved through the GRX scale, proposed by Yen et al. (2019). In this case, the GRX scale consisted of a total of nine items, with three items measuring ganqing (emotional closeness), three items measuring renqing (mutual obligation and reciprocity), and three items measuring xinren (trust and understanding). Respondents were asked to rate their agreement with each item on a 5-point Likert scale.

The virtual team competency model, proposed by Duarte and Synder (2001) was utilized in this study to measure the levels of communication, team performance and trust in the earmarked virtual teams. This comprehensive model assesses the various skills and abilities necessary for successful virtual team performance. The competency model includes three key components: Communication, Trust, and Team Performance (Duarte & Synder, 2001). These components were used as the research variables in this study to evaluate the impact of virtual teams on SSG.

Communication was measured by assessing the effectiveness of the virtual team's ability to exchange information, ideas, and opinions in a clear, concise, and timely manner. The competency model included several specific skills related to virtual communication, such as the ability to use technology effectively, the ability to collaborate and negotiate effectively, and the ability to use active listening and feedback skills (Duarte & Synder, 2001). Trust was measured by evaluating the level of confidence that team members had in one another. The competency model included several specific skills related to building and maintaining trust in a virtual team, such as the ability to demonstrate integrity, the ability to keep commitments, and the ability to maintain confidentiality (Duarte & Synder, 2001). Team Performance was measured by evaluating the virtual team's ability to achieve its goals and objectives. The competency model included several specific skills related to virtual team performance, such as the ability to work collaboratively, manage conflicts, and use decision-making and problem-solving skills effectively.

4. Empirical Findings and Discussions

4.1. Descriptive Statistics and Path Coefficients Analysis

This section constitutes of the descriptive statistics of the demographic variables of the demographic variables (Gender, Age and Level of Education), which were analyzed using SPSS version 26. The descriptive statistics will provide an overview of the sample, including the mean, standard deviation, minimum and maximum values, and frequency distribution of each demographic variable. This information was used to describe the characteristics of the sample and ensure that it is representative of the population being studied. Table 1 below outlines the descriptive statistics of these demographic variables.

The research consisted of the 150 respondents, drawn from 24 virtual teams at Jiangsu Hengli Group was primarily composed of males, with 54% of the sample identifying as male.. Furthermore, the age distribution of the sample was heavily skewed towards individuals between 41 and 50 years old, with 41.3% of the sample falling within this age range. This is followed by 37.3% of the sample falling within the 18-29 years age range and significantly lower percentages in the 31-40 age category. In terms of the education level, it was deduced that majority of the respondents 106 (70.7%) had a bachelor degree followed by 23 (15.4%) who holds a diploma. The remaining 16 (10.7%) and 5 (3.3%) had earned a master's degree or PhD level of education respectively.

Table 1: Descriptive Statistics of the Demographic Variables

Items	Characteristics	Frequency	Percentage
Gender	Male	81	54.0
	Female	69	46.0
Age	18-29	56	37.3
	31-40	14	9.3
	41-50	62	41.3
Level of Education	Above 50 Years	18	12.0
	Diploma	23	15.4
	Degree	106	70.7
	Masters	16	10.7
	PhD	5	3.3

The correlation matrix results (see table 2) show a positive correlation between Communication and Team Performance (0.170), meaning that as communication improves, team performance also improves. There is also a positive correlation between Ganqing and Renqing (0.279), meaning that people who have a positive relationship with others in the team tend to have a positive relationship with the team as a whole. However, there is a negative correlation between Trust and Communication (-0.150), meaning that when trust decreases, communication also decreases. There is also a negative correlation between Trust and Team Performance (-0.170), meaning that team performance decreases when trust decreases.

Table 2: Inter-correlation of the Variables in the study

	1	2	3	4	5	6
1. Communication	1					
2. Trust	0.150	1				
3. Ganqing	0.279**	-0.026	1			
4. Renqing	0.184*	-0.067	0.279**	1		
5. Xinren	0.341**	0.086	0.360**	0.402**	1	
6. Team Performance	-0.170*	0.040	-0.027	-0.054	-0.072	1

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

Table 3 below describes the path coefficients of the applied constructs. In this study, the Cronchbach's alpha was considered to be a convenient test to determine internal consistency of the data and variables used. The criteria utilized in this context is that a Cronchbach's alpha value of greater than 0.7 is deemed good whereas as a Cronchbach's alpha above the value 0.8 was considered better but the value greater than 0.95 demonstrated the redundancy of the applied constructs. According to Gudergan et al. (2020), explained that a suitable composite reliability should be above 0.7; since high composite reliability illustrates that all of the items used measure the same construct. The outcomes (see table 3) demonstrate that all of the composite reliability of the research variables lie between 0.756 and 0.956. The AVE was also above 0.5. Based on these tests, it can be deduced that the measurement model applied was suitable for the analysis.

Table 3: Path Coefficients of the structural Model Robustness

	Cronchbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Communication	0.842	0.852	0.602
Trust	0.853	0.845	0.613
Team Performance	0.856	0.865	0.615
Ganqing	0.756	0.758	0.698
Renqing	0.825	0.954	0.725
Xinren	0.765	0.845	0.725

The table 4 presents the evaluation of the magnitude of the effect of the interactions (f^2) between variables. In this case, f^2 refers to the size of the exogenous variable on the R^2 value of an endogenous latent variable. Based on the definition proposed by Cohen (1998), f^2 ranges is considered to be small if is between 0.02 and 0.15; moderate effect is it ranges from 0.15 to 0.3; with any f^2 above 0.3 being considered to be large. The research variables in this case had a small effect size (0.105, 0.165 and 0.034) as shown on table 4 below. A Q^2 value which is greater than 0 implies that the model utilized has predicative relevance for a particular endogenous variable; conversely, Q^2 which are equal or below 0 depict a lack of absence of predictive relevance (Randolf et al., 2017). It follows that a value of 0.257 confirm that the model has a predicative relevance.

Table 4: Predictive power and relevance of variables (f^2 and Q^2)

	f^2	Q^2
Communication → SSG	0.102	
Trust → SSG	0.112	
Ganqing → team performance	0.105	
Renqing → Team performance	0.165	
Xinren → team performance	0.034	
Team Performance		0.257
SSG		0.253

4.2. Testing of Hypothesis

4.2.1. H1: SSG is positively related to the team performance in virtual teams

The regression analysis was performed to test this hypothesis. The hypothesis: “H1: SSG is positively related to the team performance in virtual teams” was tested using the results shown in Tables 5.1 and 5.2. Table 5.1 shows the ANOVA results for the regression model. The F-statistic value is .672, and the p-value is .414. The p-value is greater than .05, suggesting that the relationship between SSG and team performance is not statistically significant. Table 5.2 shows the coefficients for the regression model. The unstandardized coefficient for team performance is -.063, and the standardized coefficient is -.067. The t-statistic value is -.820, and the p-value is .414. The p-value is greater than .05, suggesting that the relationship between team performance and SSG is not statistically significant.

Table 5.1 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.674	1	.674	.672	.414 ^b
	Residual	148.378	148	1.003		
	Total	149.053	149			

a. Dependent Variable: SSG

b. Predictors: (Constant), Team_Performance

Table 5.2 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.788	.226		12.344	.000
	Team Performance	-.063	.076	-.067	-.820	.414

a. Dependent Variable: SSG

Based on the results from Tables 5.1 and 5.2, there is not enough evidence to support the hypothesis that SSG positively relates to team performance in virtual teams. The results indicate that the relationship between these two variables is not statistically significant. Subsequently, hypothesis 1 was rejected.

4.2.2. H2: Inadequate communication will have a negative impact on SSG in virtual teams

The hypothesis; “H2: Inadequate communication will have a negative impact on SSG in virtual teams” was tested using the regression results shown in Table 6.1 and Table 6.2.

Table 6.1 shows the ANOVA results for the regression model. The F-statistic value is 22.179, and the p-value is .000. As the p-value is less than .05, this suggests that the relationship between SSG and communication is statistically significant. Table 6.2 shows the coefficients for the regression model. The unstandardized coefficient for communication is .180, and the standardized coefficient is .361. The t-statistic value is 4.709, and the p-value is .000. As the p-value is less than .05, this suggests that the relationship between communication and SSG is statistically significant.

Table 6.1 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.426	1	19.426	22.179	.000 ^b
	Residual	129.627	148	.876		
	Total	149.053	149			

a. Dependent Variable: SSG

b. Predictors: (Constant), Communication

Table 6.2 Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.049	.142		14.387	.000
	Communication	.180	.038	.361	4.709	.000

a. Dependent Variable: SSG

Based on the results from Table 6.1 and Table 6.2, it can be concluded that there is enough evidence to support the hypothesis that inadequate communication will have a negative impact on SSG in virtual teams. The results

indicate that the relationship between these two variables is statistically significant and that SSG decreases as communication decreases; ultimately setting the ground for the acceptance of the hypothesis.

4.2.3. H3: Low Trust will have a negative impact on SSG in virtual teams

The hypothesis that Low Trust will negatively impact SSG in virtual teams can be tested using the results from Table 7.1 and Table 7.2.

Table 7.1 shows the ANOVA results for the regression model. The F-statistic value is .001, and the p-value is .972. The p-value is greater than .05, suggesting that the relationship between SSG and trust is not statistically significant. Table 7.2 shows the coefficients for the regression model. The unstandardized coefficient for trust is .001, and the standardized coefficient is .003. The t-statistic value is .035, and the p-value is .972. The p-value is greater

Table 7.1 ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.001	1	.001	.001	.972 ^b
	Residual	149.051	148	1.007		
	Total	149.053	149			

a. Dependent Variable: SSG

b. Predictors: (Constant), Trust

Table 2: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.612	.139		18.801	.000
	Trust	.001	.037	.003	.035	.972

a. Dependent Variable: SSG

Based on the results from Table 7.1 and Table 7.2, there is not enough evidence to support the hypothesis that Low Trust will have a negative impact on SSG in virtual teams. The results indicate that the relationship between these two variables is not statistically significant and that changes in the trust do not significantly affect SSG; leading to the rejection of this hypothesis.

Table 8: Summary of Hypothesis testing

	Hypothesis	Status
H1	SSG is positively related to the team performance in virtual teams	Rejected
H2	Inadequate communication will have a negative impact on SSG in virtual teams	Accepted
H3	Low Trust will have a negative impact on SSG in virtual teams	Rejected

4.3. Discussion and Practical Implication

The current study aimed to investigate the impact of virtual teams on supervisor-subordinate guanxi (SSG) in the textile industry, using the Jiangsu Hengli Group as a case study. A quantitative research method was adopted, which involved collecting and analyzing numerical data. The study tested three hypotheses: H1: SSG is positively related to team performance in virtual teams (rejected) H2: Inadequate communication will have a negative impact on SSG in virtual teams (Accepted) H3: Low Trust will have a negative impact on SSG in virtual teams (Rejected) Discuss the practical implications of these results.

The results of this study have important practical implications for organizations and managers looking to enhance their virtual teams' performance. Firstly, the findings show that inadequate communication has a negative impact on SSG in virtual teams. This

highlights the importance of effective communication for maintaining positive relationships between supervisors and subordinates in virtual teams. This aligns with Huang et al. (2020)'s arguments that organizations should prioritize the development of communication strategies and tools that support effective communication between team members. This may include regular video conferencing, clear and concise emails, and collaboration software to facilitate communication.

Moreover, the research findings indicate that team performance is not significantly related to SSG in virtual teams. This means that organizations should not rely solely on team performance as a measure of the effectiveness of their virtual teams. Instead, they should consider other factors, such as communication and trust, which are more significant in building strong SSG in virtual teams (Guan & Frenkel, 2018).

The research outcomes also suggest that low trust may not have a negative impact on SSG in virtual teams. This is a positive result for organizations, as trust is often considered a challenge in virtual teams. The results indicate that organizations can focus their efforts on improving communication and other factors rather than solely on building trust in virtual teams.

4.4. Theoretical Implications

The outcomes of this research have crucial theoretical implications for the study of interpersonal relationships in virtual teams. The study contributes to the growing body of research on the role of interpersonal relationships in virtual teams and highlights the complexity of these relationships in virtual contexts. The findings suggest that while Guanxi may not directly impact team performance in virtual teams, it still plays an important role in building strong relationships between supervisors and subordinates, which are essential for effective team functioning.

Furthermore, this research underscores the importance of considering the contextual factors that may impact the relationship between SSG and team performance in virtual teams. The results suggest that other factors, such as technology use, team dynamics, and communication patterns, may also play a significant role in determining team performance in virtual teams.

4.5. Limitations and Further Research

The limitations of this research include a small sample size of 150 respondents and the findings being limited to one organization, Jiangsu Hengli Group, in China's textile industry. The small sample size reduces the generalizability of the findings, and it may not be possible to generalize the results to other organizations or industries.

Additionally, the sample used in this study was limited to employees in a single organization, which may be different from employees' experiences in other organizations. Furthermore, the results may be influenced by cultural and organizational differences in China, which could limit the generalizability of the findings to other regions and countries.

Moreover, the study's cross-sectional design only provides a snapshot of the relationship between SSG and team performance, and it needs to be clarified if these relationships persist over time. Longitudinal research designs may give additional insight into the stability of these relationships over time.

To overcome these limitations, future research could focus on larger and more diverse samples, including virtual teams from different industries and cultures, to

better understand the impact of SSG on team performance in virtual teams. Future research could also explore the role of other contextual factors, such as technology use, team dynamics, and communication patterns, to better understand the relationship between SSG and team performance in virtual teams.

5. Conclusion

The current study provided valuable insights into the impact of virtual teams on SSG in the textile industry. Results revealed that while SSG was not positively related to team performance, inadequate communication significantly negatively impacted SSG in virtual teams. However, the low trust did not have a significant impact on SSG. These findings have important practical implications for organizations utilizing virtual teams. Organizations should emphasize improving communication and minimizing barriers hindering communication in virtual teams to enhance SSG. Furthermore, organizations can focus on developing trust in virtual teams by implementing appropriate measures that increase mutual trust between supervisors and subordinates.

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