



## The Influence of Quality of Raw Materials and Quality of Production Processes on Product Quality of MSMEs: A Moderation Analysis of Supplier Partnerships

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### ABSTRACT

The objective of this research is to analyze whether supplier partnerships can strengthen or weaken the effect of the quality of raw materials and the quality of the production process on the quality of the product to be achieved. These important variables are the quality of raw materials, the quality of the production process and partnerships with suppliers, which are very important for their realization. The method used in this study is a quantitative method using a sample of 110 MSME actors as respondents, then the data is processed with SmartPLS software, and analyzed using Structural Equation Modeling (SEM). The findings of this study are that supplier partnerships do not moderate the effect of the quality of raw materials and the quality of the production process on product quality in SMEs in Serang City. The novelty of this research is to place partnerships with suppliers as a moderating variable, which in general in cases like this is training as a moderating variable, and the results are contrary to the results of research in general.

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### INTRODUCTION

Micro, small and medium enterprises, hereinafter referred to as MSMEs, are part of Indonesian society in general in their activities trying to earn income to meet their daily needs individually, in families, in groups and even for state donations. MSMEs are the business group with the largest number, approximately 99.99%, and the rest are large businesses, namely 0.001%. MSMEs contribute to the contribution of Gross Domestic Product (GDP) of more than 60%, and participate as job providers and no less than 96.92% of Indonesia's workforce is absorbed by MSMEs. (BPPS, 2021; (Iskamto et al., 2021, 2022; Iskamto & Ghazali, 2021; Iskamto & Jenita, 2020; Khairawati et al., 2022; Lamin, 2022))

The condition of MSMEs is inseparable from its advantages and disadvantages, the advantages as described above are as a driving force for the country's economy during normal times before the emergence of the 2019 outbreak. The weakness or drawback was a decline during the occurrence of Covid-19 with approximately 84% of MSMEs being strongly affected by the outbreak. (BI Survey Results, 2021). Based on these conditions it is important to have motivation as an impetus to restore the potential of MSMEs ahead of post-Covid-19, with the aim that MSME performance can immediately recover or increase, including by motivating various business sectors

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that provide raw materials, process quality with funding, and collaboration or partnerships with all stakeholders. who can play an active role in returning the situation to a good state as before.

Problems related to raw materials according to Andespa (2020) can be summarized as follows:

1. The quantity of raw materials that do not match the order
2. The quality of raw materials does not match what was ordered (thickness, cleanliness)
3. Delivery time is not as promised
4. Production process constraints (operators, assembling, skills, finishing, delays)
5. Accuracy (quality control)
6. Workers do not comply with SOP (Standard Operational Procedure).

Research on product quality, process quality, workforce quality, and raw material quality has been carried out by researchers in the fields of production and operations, including Santoso and Trianti (2021); Umboh et.al.,(2022); Sibarani and Alhazami (2022); Satar and Israndi (2019); Devi and Untoro (2019). The research he did was about the direct influence of these variables. In Hudri and Mukhsin's research (2022), research was carried out with the training variable as a moderating variable, with the result that training did not moderate the effect of raw material quality on product quality in pottery crafts in Serang. Based on the variables studied, the authors do not see the involvement of suppliers in the production process that produces quality products. For this purpose, On this occasion the author tries to raise supplier partnerships as a moderating variable that affects the relationship between the quality of raw materials and the performance of the production process in producing quality products. ThereforeThe main objective of this research is to find out whether supplier partnerships can increase the effect of the quality of raw materials and the quality of the production process on the product quality of MSMEs in Serang City, or even reduce the effect of product quality, so it is reasonable to raise the supplier partnership variable in this research model as moderating variable, with the hope of encouraging an increase in MSME performance, one of which is increased product quality ahead of post-Covid-19 in 2022.

## **LITERATURE REVIEWS**

### **Quality Theory**

Juran (1951) is an expert and expert on quality explaining that quality is a condition where a product meets customer needs which leads to customer satisfaction. Quality is also a condition where all businesses involved, including the manufacturing process must also be of high quality. Juran takes a holistic approach to quality and his concept of quality is founded on the Quality Trilogy, which consists of quality planning, quality control, and quality improvement.

**Quality planning** consist of:

- 1). Determine who the customer is;
- 2). Identify customer needs;
- 3). Develop product features;
- 4). Develop a process system that can produce excellence;
- 5). Disseminate the plan to the operational level.

**Quality control** consist of:

- 1).Assess the quality performance;
- 2). Comparing performance with goals;
- 3). Act not based on the difference between performance and goals.

**Quality improvement**with steps:

- 1). Develop the necessary infrastructure for quality improvement;
- 2). Identify and make improvements;
- 3). Form a team that is responsible for completing development projects;
- 4). Provide the motivation needed to diagnose the main problem, provide solutions, exercise control to maintain the benefits obtained.



Satar and Israndi (2019) argue that quality is the level of quality expected in dynamic conditions related to products, human services, processes and the environment that meet or exceed expectations.

### **Product quality**

According to Heizer and Render (2011) that product quality is all the features and characteristics of a product or service in its ability to meet visible and obvious or hidden needs.

Kotler and Armstrong (2012) suggest that product quality is a characteristic of the product's ability to perform its product functions which include durability, reliability, accuracy produced, ease of operation, ease of repair and other attributes that support product quality.

Daulay et al., (2021) argued that product quality is the deepest factor that can show products have value from a consumer's point of view which can realize consumer expectations in the form of quality fulfillment by producers.

According to Hilary and Wibowo (2021); Sibarani and Alhazami (2022) stated that there are 5 indicators that can be used in measuring product quality, namely:

1. Performance (product performance), is an important factor in creating a product.
2. Product features are product characteristics that can provide value and interest to customers.
3. Trust in the product (product reliability), is product trust that has a very small error rate
4. Product durability is the level of strength that a product has to last for a certain economic life.
5. Product aesthetics (product aesthetics), is the main value that is owned by the product for the direct correlation of consumers with the products they use.

Furthermore Gavin (2016) suggests that product quality indicators consist of: performance, product features, reliability, conformance, durability, serviceability, aesthetics. ), and perceived quality (perceived quality).

### **Raw Material Quality**

Quality is the factors that cause goods or services to have value that can meet the goals and needs for the results of a process, (Assuari, 2008). While raw materials are the main ingredients of a production process that produces goods or products, (Prawirosentono, 2007).

Dinda WR et al. (2021); and Sibarani and Alhazami (2022) put forward 3 (three) indicators that can be used to measure the quality of raw materials, namely:

1. Availability of raw materials to be used
2. The quality of the raw materials used
3. Ease of obtaining the raw materials needed.

Thus it can be stated that: Raw materials are the main production factors that must be provided by the company to be processed into quality products to achieve company goals. The raw material quality indicators used in this study are: the availability and adequacy of raw materials, raw material quality standards according to the customer's agreement, and the security of the delivery of raw materials in the long term. (Dinda WR. et al., (2021) and Sibarani and Alhazami (2022).

### **Production Process Quality**

The production process is a way, method or technique to create or a process that adds to the usefulness of an item or service by using its production factors, (Assauri, 2008). Furthermore Yamit (2011) argues that the production process is a transformation where input becomes output in the form of goods or services that have a higher value. According to Sentosa and Trianti (2017) that the production process is the concept of creating and adding to the function of goods or services involving labour, machinery and equipment and available funds. Furthermore, Sharma (2017) argues that process quality refers to functional quality which includes technical or core quality that is effective and efficient.

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Handoko (2011) suggests that operational performance is a managerial activity carried out in the selection, design, renewal, operation and supervision of production systems. Furthermore, the dimensions for measuring operational performance are cost, quality, flexibility, and delivery (Wiengarten, et al., 2010).

The production process indicators used in his research are Hilary and Wibowo (2021); Sibarani and Alhazami (2022) are:

1. Skilled workforce
2. Machinery and equipment used for a production process, in order to produce effectively and efficiently
3. Sufficient funds for the implementation of the production process.

Devi and Untoro (2019) argue that the quality of the process relates to the technical implementation of the service, the provision of services that are fast, precise and safe, so that consumers feel comfortable.

Based on the opinions of these researchers, it can be stated that: Quality of production is the activity of converting or processing the factors of production (resources) owned by the company based on standard processes to produce quality products, according to company goals. The indicators of the quality of the production process in this study are: ownership of a trained workforce (having expertise), machines or equipment according to the required technology, has operational standards and procedures (SOP), so that the production process will be of high quality.

### **Supplier Partnership**

The role of the supplier in a manufacturing company as a producer of goods in the form of goods is very important and very calculated, because the supplier's performance must always be maintained by the security of the supply of goods. In general, supply performance can be seen from several important indicators including: the number of goods sent, the timeliness of delivery, and long-term safety. Based on these interests, the company should cooperate with suppliers in any case and no matter how small the company's needs for the goods needed by the company. Farzier and Straus (2020) in Samuzzaki and Wasito (2022) argue that partnerships are collaborations that represent business owners to seek profit based on the partnership laws that apply in a country.

Maloni and Benton (1999) suggest that the main factors of supplier performance are commitment, conflict, conflict resolution, cooperation, and trust.

Based on this description, it can be stated that: Supplier partnerships are collaborations established with suppliers to maintain the security of the production process for production factors in the long term. Furthermore, the indicators used in this study refer to the research of Maloni and Benton (2019) namely: commitment, cooperation, and trust. All of the indicators were not adopted with the consideration that the indicators were adjusted to the conditions of the SMEs studied, meaning that 3 (three) indicators could already represent the partnership variable.

### **Relations between Variables**

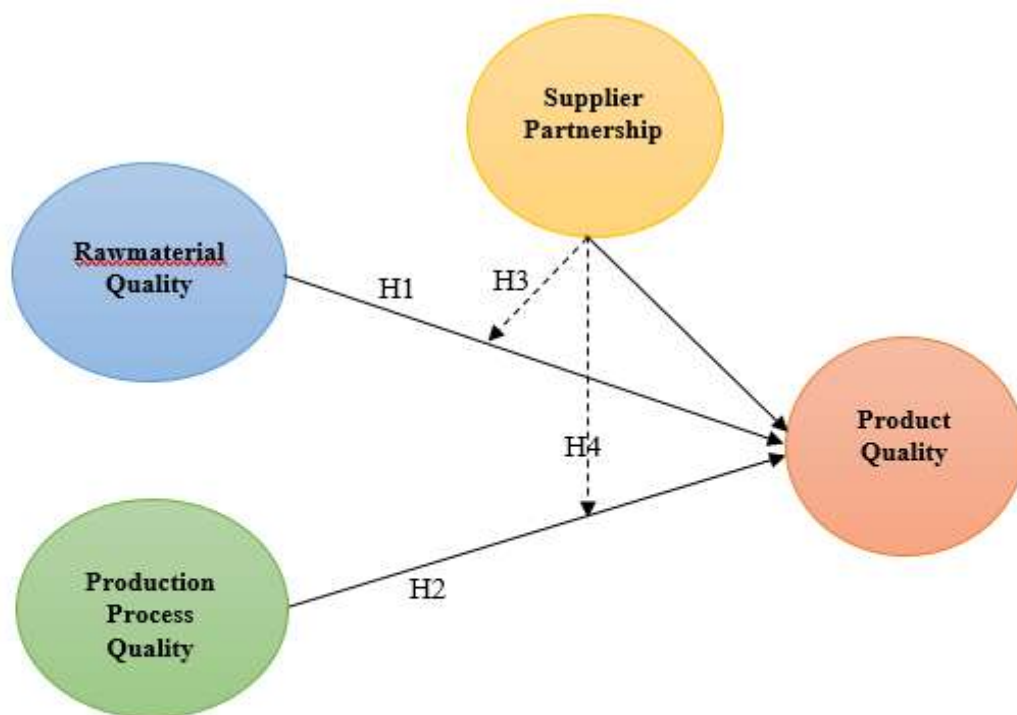
Santoso and Trianti (2021) researched the effect of the quality of raw materials, quality of production and labor on product quality, obtained the result that the quality of raw materials, production processes and quality of labor had a positive and quite strong relationship with product quality, which was explained by 52%. raw material quality, production process and labor quality on product quality, and the remaining 41.8% is explained by other variables not examined in this study.

Umboh et al., (2022) who examined the quality of raw materials and production processes on product quality showed the results that the quality of raw materials had a positive and significant effect on product quality, the production process had a significant positive effect on product quality, labor quality had a significant positive effect on product quality. Furthermore, based on the R Square value, product quality is explained by the quality of raw materials, production processes, and labor quality by 75.70% and the remaining 24.30% is explained by other variables not examined in this study.

Sibarani and Alhazami (2022) examined the effect of the quality of raw materials and production processes on product quality, with the result that there was a positive and significant relationship between the quality of raw materials and production processes on product quality with an R Square value of 48.70%, and the remaining 52.30% is explained by other variables not examined in this study. Satar and Israndi's research (2019) yields a value that the quality of raw materials partially has a positive and significant effect on product quality.

Furthermore, Devi and Untoro (2019) examined process quality, infrastructure quality and interaction quality on loyalty, found that process quality had a positive and significant effect on customer loyalty as process performance. Hudri and Mukhsin (2022) conducted research with the result that the quality of raw materials had a positive and significant effect on product quality, the production process had a positive and significant effect on product quality, but training did not moderate the effect of the relationship between raw material quality and product quality in pottery crafts in Attack. Furthermore, based on the description of the research results, it can be concluded that the research model and hypotheses that were built in Figure 1:

**Image 1**  
**Research Models**



Information:

- > : *Direct Effect*
- - - - -> : *Indirect Effect (moderation effect)*
- Source : *Secondary data, processed, 2022*

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### Research Hypothesis

- H1: The quality of raw materials has a positive and significant effect on product quality
- H2: The quality of the production process has a positive and significant effect on product quality
- H3: Supplier partnerships have a positive and significant effect on product quality
- H4: Supplier partnerships moderate the effect of raw material quality on product quality
- H5: Supplier partnerships moderate the effect of production process performance on product quality

### METHODS

This research is a quantitative research with a descriptive and verification approach. Quantitative research is carried out where researchers make it possible to build hypotheses and test them empirically, are causal or causal (Ferdinand, 2014).

This research was conducted on MSME owners in Serang City, with the number of samples referring to the sampling criteria proposed by Ferdinan (2014), namely the number of feasible samples is the number of indicators multiplied by a multiplier between 5 and 10. The indicators in this study are 11 indicators and the multiplier factor 10, so the feasibility of the maximum number of samples is 110, with the calculation:

$$\begin{aligned}\text{Number of samples} &= 10 \times \text{number of variable indicators} \\ &= 10 \times 11 = 110 \text{ respondents.}\end{aligned}$$

The data analysis technique used is structural equation modeling (SEM) with the help of SmartPLS 3.3 software to process the data. The sampling technique used is purposive sampling, and the data used is primary data collected based on random distribution of questionnaires to business owners or MSME actors in Serang City.

*Structural Equation Modelling*(SEM) which is used as a data analysis technique is used to test the statistical model with several provisions, namely to test the validity based on the value of loading factors  $> 0.5$ , AVE  $> 0.5$  and the indicator value of the construct variable is greater than the other construct variables, then to test the reliability using the value composite reliability  $> 0.7$  and cronbach's alpha  $> 0.6$  (Abdillah and Hartono, 2015).

To test the hypothesis, it is done by comparing the calculated t value with the t table value, if the t calculated value is greater than t table, then the hypothesis is accepted, and vice versa, or with the understanding that if the t-statistic value is  $> 1.96$ , then the hypothesis is accepted. and vice versa, then to determine the significance using the value if the p value  $< 0.05$ , then the influence relationship is significant.

To find out the R-Square value which explains the magnitude of the influence of exogenous variables on endogenous variables, use the substantive range, namely between R-Square values: 0.75, 0.50, and 0.25 with the conclusion of the model: strong, medium and weak (Ghozali, et al. al. 2015). Meanwhile, to find out the role of the mediating variable, the Variance Accounted For (VAF) test is used with the criteria if the VAF value is greater than 80%, then the variable mediates in full (full mediation), if the VAF value ranges from 20% to 80%, then the mediating variable is fully mediated. partial mediation and VAF values below 20% indicate that there is no mediating effect on these variables (Hair et. al., 2013; Sholihin, 2014).

### RESULTS AND DISCUSSION

#### RESULTS

The research results include an outer model with convergent validity and discriminant validity, as well as composite reliability. Furthermore, for the inner model, it discusses the influence between variables with R2 square, hypothesis testing, and testing the influence of moderating variables.

##### 1) Outer Model Analysis

Based on the results of the convergent analysis used to measure the validity of the construct indicators, it is determined based on the loading factor value with the criterion that an indicator

is said to be valid if the loading factor value is greater than 0.7. These values can be seen in table 1:

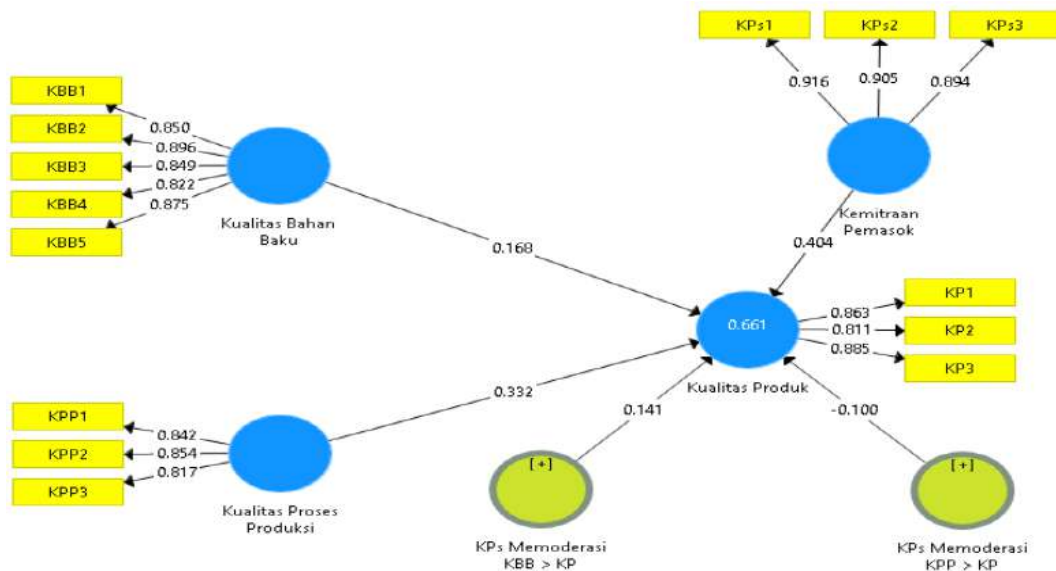
Tabel 1 Nilai Faktor Loading Berdasarkan Convergent Validity

Indikator	Loading Factor	Cut of Value	Keterangan
KBB-1	0,850	0,7	Valid
KBB-2	0,896		Valid
KBB-3	0,849		Valid
KBB-4	0,822		Valid
KBB-5	0,875		Valid
KPP-1	0,842	0,7	Valid
KPP-2	0,854		Valid
KPP-3	0,817		Valid
KP-1	0,863	0,7	Valid
KP-2	0,811		Valid
KP-3	0,885		Valid
KPs-1	0,916	0,7	Valid
KPs-2	0,905		Valid
KPs-3	0,894		Valid

Sumber: Data primer diolah, 2022

Furthermore, it can be seen from the research model formed in Figure 2:

Figure 2. Research Model with Factor Loading Value



To see the validity value of a construct, it can be seen from the results of the composite reliability and Cronbach alpha tests with the stipulation that if the composite reliability and Cronbach alpha values are greater than 0.7, then the construct is said to be reliable. The composite reliability and Craobach's alpha values can be seen in table 2:



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Table 2. Composite Reliability Analysis Results and Cronbach Alpha

Variable	Composite Reliability	Cronbach's Alpha	Cut of Value	Information
Raw Material Quality	0.933	0.912	0.7	Reliable
Production Process Quality	0.876	0.787	0.7	Reliable
Product quality	0.890	0.818	0.7	Reliable
Supplier Partnership	0.932	0.890	0.7	Reliable

Source: Primary data processed, 2022.

Based on table 1 and figure 1 regarding the factor loading values, it is illustrated that all indicators analyzed and used in this study are valid based on convergent validity, because the factor loading values already meet the requirements, namely greater than 0.7, meaning that each indicator can represent the construct studied. Furthermore, in table 2 regarding the composite reliability and Cronbach's alpha values, they also meet the requirements, namely the value is greater than the cut of point of 0.7, meaning that the research instruments used are reliable or in other words that respondents have consistent answers to questions or statements. when used twice to measure the same symptoms.

## 2) Inner Model Analysis

The results of the evaluation of the inner model illustrate the influence between the variables studied, namely raw material quality, production process quality, product quality and supplier partnerships. Evaluation of the inner model is done by looking at the value of R<sup>2</sup> (R Square). The results of the research for the value of R<sup>2</sup> (R Square) are in table 3:

Table 3 Value of R<sup>2</sup> (R Square)

Variable	R <sup>2</sup> (R Square)	Rule of Thumb	Conclusion
Product quality	0.661	0.75 ----0.50 ---- 0.25 strong, moderate, weak	Moderate

Source: Primary data processed, 2022

Thus it can be stated that the R<sup>2</sup> value of 66.1% implies that: product quality can be explained by the variable quality of raw materials and the quality of the production process by 66.1 percent and the remaining 3.9% is explained by other variables not examined in the model this.

The value of R<sup>2</sup> is in the range of 0.50 to 0.75, with the category that the effect is moderate.

Furthermore, to test the hypothesis is done by comparing the t-count or t-statistic value with the t-table value which is 1.96. The values compared are as in table 4, in the table of results of t test analysis and significance.

Table 4. Results of t test analysis and significance

Connection Between Variables	Coefficiency	Standard Deviation	t. Statistics/ t. Count	P Value
KBB→KP	0.168	0.098	1.705	0.089
KPP→KP	0.332	0.099	3,342	0.001
KPs→KP	0.404	0.100	3,730	0.000





KPs→KBB*KP	0.141	0.135	1,046	0.296
KPs→KPP*KP	-0.100	-0.098	1.019	0.309

Source: Primary data processed, 2022

Based on statistical analysis through SmartPLS operations, the results are as shown in table 4, so the results of testing the hypothesis can be conveyed that:

**H1:** The quality of raw materials has a positive and significant effect on product quality.

The results of the statistical analysis of the direct effect of raw material quality on product quality obtained a t-count value of 1.705 and a t-table value of 1.96, with a P value of 0.089. Based on the results of the data analysis, the t statistical value is less than 1.96, and the P value is greater than 0.05, so it can be stated that the quality of raw materials has no effect and is not significant on product quality, and hypothesis 1 is rejected.

**H2:** The quality of the production process has a positive and significant effect on product quality.

The results of statistical analysis of the direct effect of the quality of the production process on product quality with a positive coefficient value of 0.332, and obtained a t-count value of 3.342 and a t-table value of 1.96, with a P value of 0.001 which is less than 0.05 or significant. Based on the results of the data analysis, the statistical t value is greater than the t-table value, with a positive relationship direction and a P value greater than 0.05 or significant. So it can be stated that the quality of the production process has a positive and significant effect on product quality, and hypothesis 2 is accepted.

**H3:** Supplier partnerships have a positive and significant effect on product quality.

The results of the statistical analysis of the influence of supplier partnerships on product quality show that the t value is 3.730 and the P value is 0.000, with a positive coefficient value of 0.404. Thus it can be said that the t-count is greater than 1.96, the P value is less than 0.05, and the direction of the relationship is positive, meaning that the supplier partnership has a positive and significant effect on product quality, and hypothesis 3 is accepted.

**H4:** Supplier partnerships moderate the effect of raw material quality on product quality.

The results of statistical analysis of the indirect effect of moderating partnerships with suppliers on the influence of product quality obtained a t-count value of 1.046 and a t-table value of 1.96, with a P value of 0.296. Based on the results of the data analysis, the statistical t value is smaller than the t-table value, so it can be stated that supplier partnerships do not moderate the effect of raw material quality on product quality, and are not significant because the P value is greater than 0.05. Thus hypothesis 4 is rejected.

**H5:** Supplier partnerships moderate the influence of production process quality on product quality.

The results of statistical analysis of the indirect effect of moderating partnerships with suppliers on the influence of product quality obtained a t-count value of 1.019 and a t-table value of 1.96, with a P value of 0.309. Based on the results of the data analysis, the statistical t value is smaller than the t-table value, so it can be stated that the supplier partnership is not able to moderate the effect of the quality of the production process on product quality, and is not significant because the P Value is greater than 0.05. Thus hypothesis 5 is rejected.

## DISCUSSION

In the first hypothesis it is generated that the quality of raw materials does not have a positive and significant effect on product quality, meaning that every increase of one unit of raw material quality does not lead to an increase in product quality. The results of this study do not support the research

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conducted by Santoso and Trianti (2021); Umboh et al., (2022); Sibarani and Alhazami (2022) and Satar and Israndi (2019), whose research results state that the quality of raw materials has a positive and significant effect on product quality.

In the second hypothesis it is produced that the quality of the production process has a positive and significant effect on product quality, meaning that every increase of one unit of quality in the production process will increase one unit of product quality. These results support the results of research that has been carried out by Santoso and Trianti (2021); Umboh et al., (2022); Sibarani and Alhazami (2022); and Devi and Untoro (2019) as well as Hudri and Mukhsin (2022) whose research results state that the quality of raw materials has a positive and significant effect on product quality.

The third hypothesis results that partnerships with suppliers have a positive and significant effect on product quality, meaning that every increase of one unit of partnership with suppliers can increase one unit of product quality.

The fourth hypothesis is that partnerships with suppliers do not moderate the effect of raw material quality on product quality, meaning that partnerships with suppliers cannot increase the effect of raw material quality on product quality. Another understanding is that every increase of one unit of raw material quality which can increase one unit of product quality, is not caused by a partnership with suppliers.

The fifth hypothesis is that partnerships with suppliers do not moderate the effect of the quality of the production process on product quality, meaning that partnerships with suppliers cannot increase the effect of the quality of the production process on product quality. Another understanding is that every increase of one unit of quality in the production process which can increase one unit of product quality is not caused by a partnership with suppliers.

## **CONCLUSION**

Based on the results of the analysis and discussion, several conclusions can be conveyed from this study. The quality of raw materials does not have a positive and significant effect on product quality, meaning that every increase of one unit of raw material quality cannot improve product quality. However, on the other hand, the quality of the production process has a positive and significant effect on product quality, meaning that every increase of one unit of quality in the production process can increase one unit of product quality, for SMEs in Serang City. Partnerships with suppliers have a positive and significant effect on product quality, meaning that every increase of one unit of partnership with suppliers can increase one unit of product quality, for SMEs in Serang City.

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