ISSN: 2338-8412 e-ISSN : 2716-4411

Ekombis Review – Jurnal Ilmiah Ekonomi dan Bisnis
Available online at : https://jurnal.unived.ac.id/index.php/er/index
DOI: https://doi.org/10.37676/ekombis.v13i1

The Influence Of Product Design And Process Design On Product Quality At UD. Meto In West Nias Regency

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How to Cite :
Waruwu, S., Zebua, S., Mendrofa, D, S, M., Bate'e, M, M., (2025). The Influence Of Product Design And Process Design On Product Quality At UD. Meto In West Nias Regency.EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi Dan Bisnis, 13(1). doi: https://doi.org/10.37676/ekombis.v13i1

ARTICLE HISTORY
Received [23 Agustus 2024]
Revised [08 January 2025]
Accepted [14 January 2025]

KEYWORDS
Product Design, Process Design, Product Quality.

Abstract

The problem phenomenon that emerged at the research location was the emergence of current furniture trends and styles, ergonomically made by considering comfort, efficiency and minimalism that emphasizes simplicity but elegance that is in great demand by customers.The research approach used in this study is a quantitative approach. In this study, a sample of 30 people was taken from the population according to the guidelines.The data collection techniques used were observation, questionnaires, and documentation. From the results of the study, it was obtained that product design has a significant influence on product quality at UD. Meto. This is reinforced by the T-statistic value of 3.058 and the P-value (Sig.) Of 0.005 which is smaller than alpha (0.05). Therefore, improving product design can be an effective strategy to improve product quality. Process Design also has a significant influence on product quality at UD. Meto. The T-statistic value of 3.413 and the P-value (Sig.) Of 0.002 indicate that process design plays an important role in shaping product quality. Therefore, planning and process design strategy can improve the level of product quality. Together, Product Design and Process Design have a positive and significant influence on Product Quality at UD. Meto. The results of the F-Statistic test of 37.769 and P-value (Sig.) of 0.000 indicate that the combination of product design and process design has a greater impact on product quality.

INTRODUCTION

The development of technology has a major impact on human life, especially in today's business world. The emergence of various businesses, both small and large scale, has led to

increasingly tight competition among companies, both those engaged in the same and different fields. Therefore, production planning is one of the important steps in facing competition, developing business, and achieving profit. To win the competition, companies need to offer quality products that are able to meet the changing tastes of shoppers. Therefore, it is important for businesses to know the changing preferences and needs of their customers. The quality of the products produced and offered by the company greatly determines the success in meeting customer expectations.

Understanding consumer desires is a major concern for companies in various industries, including the furniture industry. This is due to the increasing interest of individuals in the design of household appliances, especially among the rapidly growing community. This development is reflected in designs that continue to follow technological advances and current trends, such as minimalist designs that are designed and produced to meet the needs of housing and various other places.

Currently, in the property industry, business competition is increasing and companies are trying to find profit by creating attractive designs that are in accordance with the trends that are popular with the public. Competition between similar companies encourages them to keep consumers loyal and attract more. High consumer demand for fresh products also encourages companies, especially in the property industry, to innovate and create new designs to stay relevant and up-to-date.

Existing product and process designs need to be continuously maintained and improved, as this reflects the company's identity. Efforts to maintain superior design and become number one are essential to maintain a positive company image in the eyes of customers. With the rapid development of technology and social change, competition between business actors is increasingly fierce. To keep customers interested in their products, businesses must continue to come up with new ideas and use the right tactics.

Lahomi District and its surroundings have great potential to produce companies that produce innovative and high-quality products, attracting consumer interest. One example is a manufacturing company in the construction sector that is widely known in various circles. To maintain its position amidst global competition, this company must continue to improve the quality of its products. The design of the products produced is greatly influenced by the entire production process, from start to finish.

Maintaining product design must be a top priority to maintain a positive company image in the eyes of consumers. Product design is a reflection of the results of production. The better the model and the more it is used by the community, the more positive the perception of the company.

The problem phenomena that emerged at the research location were 1) The emergence of current furniture trends and styles, ergonomically made by considering comfort, efficiency and minimalism that emphasizes simplicity but elegance that is in great demand by customers. This phenomenon encourages UD. Meto to try to find a solution on how to design products and design furniture processes that can follow the expectations and desires of customers and not switch to other similar companies, 2) Lack of variation in the selection of colors, sizes, or product styles resulting in customer dissatisfaction with the furniture products so that customers switch to other companies. This phenomenon encourages UD. Meto to design product designs and furniture process designs to have aesthetics and interesting variations so that customers feel satisfied with quality products, 3) Lack of furniture product planning so that it does not provide comfort, a warm and relaxed atmosphere and does not provide an attraction for customers because it does not match customer desires. This phenomenon encourages furniture designs that are made to meet customer expectations and desires

Understanding the influence of design and design processes on the quality of furniture products is very important, because design has a significant impact on consumer perception, comfort of use, and the aesthetic value of a product. Design also plays a key role in creating the

visual appeal of a product. Consumers are often attracted to products that have attractive designs and attractive aesthetics. Good design can make a product stand out among competitors and attract the attention of potential consumers.

Design can affect perceptions of product durability and affordability. Environmentally friendly designs or using durable materials can increase the value of a product in the eyes of consumers. By understanding the influence of design on product quality, companies can design furniture products that not only meet customer functional requirements but also add value through aesthetic aspects, comfort, and differentiation from competitors.

Based on the phenomenon of problems that have been explained by researchers and the influence of design on the quality of furniture products at the research location, researchers are very interested in investigating further the impact of process design and product design on product quality.

LITERATURE REVIEW

Definition Of Product Design

According to Kotler and Keller (2019: 332), design is the overall features that affect how a product looks, feels, and functions for consumers. Design offers three main aspects:

1. Function
2. Aesthetics
3. Attractiveness

According to Kotler and Keller, good design for a company is related to ease of manufacture and distribution. Meanwhile, for consumers, good design is a product that is visually appealing, as well as easy to open, install, use, revise, and destroy.

According to Azany (2020: 45), product design can be considered as an effort to improve or simplify a product. Improvement includes simplification aimed at making it easier to use the product, while increasing the function and usefulness of the product.

According to Stanton (2020), product design is one of the key aspects in shaping a product's image. Companies are increasingly aware of the marketing value of product design, especially its appearance design. The two main factors in product design are color and product quality. Choosing the right color can provide additional benefits in marketing. The accuracy of management in choosing the right color and determining the right time to change the color of the product can provide more benefits for the company. Optimally utilized colors can increase product sales. The same applies to ensuring that the image of product quality matches consumer needs. Marketing executives must be able to make the right decisions about product quality, so that the product meets the level of quality that matches its function.

According to Kotler (2019), there are seven product design parameters, namely:

1. Characteristics
   The characteristics of a product that support its fundamental function are called characteristics. Many items can be equipped with different additional highlights. The characteristics of a product serve as a competitive tool to differentiate it from competitors. Some organizations are very imaginative in adding new elements to their products. The stable capacity of Japanese companies to work on certain superior products, such as watches, vehicles, and number processors, is one of the important elements in their success. It is considered very effective to face competition by adding new features.
2. Performance
   Buyers of expensive products often compare the performance of various brands in terms of the level of key product characteristics when operating. Often, customers are willing to pay more for better performance as long as the additional cost is considered worth it.

3. Conformance Quality
   The extent to which the design and operation of a product meet the desired standards is called conformance. Conformance quality refers to the degree of conformity and satisfaction of all delivered units compared to predetermined target details. Because it is concerned with conformance to these specifications, this procedure is called conformance.
4. Durability
   Durability is a measure of the expected period of time for which a product will operate. For example, Volvo promotes its cars as having a longer service life to justify a higher price. Buyers are generally more likely to pay extra for products that promise longer service life.
5. Reliability
   Reliability describes the likelihood that a product will not fail or malfunction within a specified period of time. Buyers tend to pay more for products that have a high reputation for reliability because they want to avoid the cost and time required to perform repairs.
6. Repairability
   The ease with which a product can be repaired if a problem or failure occurs is known as "repairability." The ideal repairability is when the product can be repaired quickly and easily at little or no cost.
7. Model (Style)
   The model describes the extent to which a product is attractive and liked by consumers. The model provides advantages through distinctive product features that are difficult to imitate. For example, many car buyers are willing to pay more for a Jaguar because of its striking design, even though the Jaguar may not have the same advantages in terms of durability (reliability).
   One of the factors that consumers consider when buying a product is the use of high-quality materials. In addition, an elegant and luxurious design also influences purchasing decisions, so the relatively high price of the product can be considered reasonable.

Definition Of Process Design

The model or scheme for implementing production activities is called process design. This interaction includes various points of view, such as form, quality, materials used, and the type of creation itself. The following are some definitions of process design for a deeper understanding. Mitra Bestari (2019: 39), process design is a system or way to change existing resources into desired products. Each element in production has a specific function that explains its use. Function and process design aim to regulate production activities with the aim of reducing production costs. Sukanto Reksohadiprodjo (2019: 13) said that the selection of inputs, workflows, and methods of making goods and services are all part of process design. Input determination includes the selection of human resources, natural materials and hardware used in the functional cycle, and adjusting them to the association system and the ability to obtain human resources.

Product and service process design, according to Haming and Numajamudin (2019:300), involves cross-departmental and functional activities that involve the interaction of ideas, coordination, and actions from various functions such as marketing, industrial engineering, production, human resources and law. From the opinion above, it tends to be concluded that the cycle configuration includes cross-departmental or practical cooperation within the organization. This includes the creation process, human asset council, tasks, and company systems.

Product Quality

In the contemporary Indonesian word reference, the quality of goods is characterized as the positive or negative degree of eligibility or administration. According to M. Suyanto (2017: 110), quality refers to the extent to which an item can meet the specific needs of a client. Meanwhile, according to Deming (2020: 3), quality is the extent to which a product meets the

needs of the market or consumers, and businesses must fully understand consumer expectations of their products. Garvin and Davis (2019: 34), Environment, labor, processes, and tasks, as well as aspects of the product itself, all aim to meet or even exceed customer or consumer expectations in terms of product quality. In the contemporary Indonesian word reference, the quality of goods is characterized as the positive or negative degree of eligibility or administration. According to M. Suyanto (2017: 110), quality refers to the extent to which an item succeeds in meeting the explicit needs of the client.

Deming explains that quality refers to the extent to which a product meets the needs of the market or consumers, so business actors must really know what consumers expect from their products. Meanwhile, according to Garvin and Davis (2019:128), product quality is a continuously evolving state that includes the product itself, labor, processes, and tasks, and the environment. The goal is to meet or even exceed customer or consumer expectations. In the reference of Contemporary Indonesian words, goods are characterized as labor and products that are delivered and purchased. According to Tjiptono (2017), goods are one of the goods that can be purchased in a store to be bought, sold, or consumed in large quantities to improve health and well-being. Products are often considered special deals, but they actually have more meaning than that.

Anything that can be offered to the market to satisfy a want or need is considered a product in general. Examples of products include tangible goods, services, experiences, events, people, locations, properties, organizations, information, and concepts. An item can be characterized as anything that is displayed to stand out, obtained, utilized or consumed to satisfy a need or need.

According to Kotler (2019), a product includes anything that can be displayed to stand out, utilized, or consumed to satisfy a need or need. Meanwhile, Ricky W. Griffin and Ronaldo J. Products according to Ebert (2019:203) are a collection of values that provide benefits to satisfy customer desires and needs. According to M. Nur Rianto (2020:266), in its basic sense, an object is a collection of physical properties and substances that are original and coordinated in a uniform and known structure. However, in a broader sense, products include various physical (tangible) and non-physical (intangible) characteristics that consumers receive as fulfillment of their desires or needs, such as color, price, packaging, reputation, and producer service.

Purpose And Objectives Of Process Design

Before starting the creation exercise, careful planning in the implementation of the creation cycle is very important. Through careful manufacturing planning, organizations can choose the raw components, types of manufacturing interactions, and hardware to be used. This method not only aims to control production costs, but also ensures that production volume meets the expected targets. Hani (2020:143) understands that in the cycle plan, items are made with predetermined arrangements. The company then decides whether to produce the product internally or to purchase it from another party. Process design also plays a role in determining the feasibility of producing a product. Therefore, process design seeks to select the most economical method of producing an item using existing or potential machinery and offices.

METHODS

The research approach used in this study is a quantitative approach. According to Arikunto (2018: 134), if the number of research subjects is less than 100 people, it is better to conduct population research, all subjects are used as samples. However, the sample can be taken half if the number of subjects is more than 10-25% or more of the total population. In this study, a sample of 30 people was taken from the population in accordance with these guidelines.

By determining the location of the research, the research object and research objectives are certainly fixed and clear, so that it can facilitate the research process and can conduct

research to obtain accurate results. This research was conducted at UD. Meto in West Nias Regency. The data collection techniques used were observation, questionnaires, and documentation. While the data analysis techniques used were validity tests, reliability tests, correlation coefficient tests, determinant coefficient tests, t tests and f tests.

RESULTS

Testing The Validity Of Question Items On Product Design Variables (X1)

To test the validity of each question item, the researcher used the help of the SPSS For Windows Version 26 computer program. The validity test was carried out by comparing the calculated r value with the table r value. In this study, the table r value was obtained from the degree of freedom (df) = n – k, with n = 30 and k = 2, so that df = 28. Based on the table, the table r value for df = 28 with a significance level of 0.05 is 0.361. The validity requirement is if the calculated r value is positive and greater than the table r value, then the question item is considered valid.

Table 1 Results Of The Validity Test Of Question Items Variable X1

No	Description	*Pearson Correlation* (r hitung)	r table (α = 5%)	Result
1	X1.1	0,607	0,361	Valid
2	X1.2	0,701	0,361	Valid
3	X1.3	0,545	0,361	Valid
4	X1.4	0,554	0,361	Valid
5	X1.5	0,685	0,361	Valid
6	X1.6	0,609	0,361	Valid
7	X1.7	0,593	0,361	Valid
8	X1.8	0,692	0,361	Valid

Source: Research Results of Researchers, processed by SPSS Version 26 (2024)

From the table of results of the validity test analysis using SPSS For Windows Version 26, each question item on variable X shows a calculated r value that is greater than the r table value, which is 0.361. This indicates that each question item in variable X is declared valid (for details of SPSS calculations, see the appendix). Validity testing is a method for assessing the extent to which a test or questionnaire is able to measure what should be measured. Validity or validity is indicated by the ability of the measuring instrument to measure what is intended. This process involves comparing the values of A and B. If the value of A is greater than B, then the statements and indicators in the study are considered valid. Conversely, if the value of A is less than B, then the statement is considered invalid.

Testing The Validity Of Question Items On Product Design Variables (X2)

Next, the researcher conducted a validity test for the Process Design variable (X2) using SPSS For Windows Version 26, similar to the validity test on the previous variable. This validity test process is carried out by comparing the calculated r value with the table r value. In this study, the table r value was obtained from the degree of freedom (df) = n - k, where df = 30 - 2, so df = 28. With a significance level of 0.05, the table r value obtained was 0.361.

The requirement to declare a question item valid is if the calculated r value is greater than the table r value. If the calculated r value is positive and greater than the table r value, then the question item can be declared valid.

Table 2 Results Of The Validity Test Of Question Items Variable X2

No	Description	*Pearson Correlation* (r hitung)	r table (α = 5%)	Result
1	X2.1	0,732	0,361	Valid
2	X2.2	0,523	0,361	Valid
3	X2.3	0,529	0,361	Valid
4	X2.4	0,540	0,361	Valid
5	X2.5	0,520	0,361	Valid
6	X2.6	0,695	0,361	Valid
7	X2.7	0,592	0,361	Valid
8	X2.8	0,679	0,361	Valid

Source: Research Results of Researchers, processed by SPSS Version 26 (2024)

Testing the Validity of Question Items on Product Design Variables (Y)

Next, the researcher conducted a validity test for the Product Quality (Y) variable using SPSS For Windows Version 26, as in the previous variable test. The validity test process is carried out by comparing the calculated r value with the r table value. In this study, the r table value is determined based on the degree of freedom (df) = n – k, with df = 30 – 2, so that df = 28. With a significance level of 0.05, the r table value obtained is 0.361.

The requirement to declare a valid question item is if the specified r value is greater than the r table value. Assuming the specified r value is positive and exceeds the r table value, then the matter being investigated can be declared substantial.

The provisions or requirements for legitimacy testing are assuming the specified r value is positive and more prominent than the r table value, then the matter being asked can be declared valid.

Table 3 Results Of The Validity Test Of Question Items For Variable Y

No	Description	*Pearson Correlation* (r hitung)	r tabel (α = 5%)	Result
1	Y.1	0,742	0,361	Valid
2	Y.2	0,443	0,361	Valid
3	Y.3	0,659	0,361	Valid
4	Y.4	0,518	0,361	Valid
5	Y.5	0,525	0,361	Valid
6	Y.6	0,676	0,361	Valid
7	Y.7	0,675	0,361	Valid
8	Y.8	0,709	0,361	Valid
9	Y.9	0,692	0,361	Valid
10	Y.10	0,781	0,361	Valid

Source: Research Results of Researchers, processed by SPSS Version 26 (2024)

From the table above, it is known that the validity of the correlation between variables shows a significant relationship and a strong correlation between each pair of variables. The calculated r value for each item is greater than the r table value, so it can be concluded that variables X1 (Product Design), X2 (Process Design), and Y (Product Quality) are all valid.

In addition, reliability measures the extent to which the research instrument can be relied on. With a Cronbach's Alpha value approaching 1, it indicates a high level of reliability, meaning that the instrument is consistent and can be trusted in measuring the variables studied.

DISCUSSION

Based on the interview results above, it can provide an explanation of the Village SDGs System Analysis in Sustainable Development in Loloana'a Gido Village, Gido District, Nias Regency. The Village SDGs system analysis is an important approach to understanding the objectives of SDGs that can be implemented in an integrated manner at the village level. In the context of Loloana'a Gido Village, Gido District, Nias Regency, this analysis will help identify the potential, challenges, and strategies to achieve sustainable development, namely:

1. Understanding the Village SDGs Concept
   Village SDGs are an adaptation of several global SDGs goals that are adjusted to the local village context. Village SDGs emphasize the importance of sustainable, inclusive, and equitable development for all villagers.
2. Identification of Potential and Challenges
   In terms of natural resources, Loloana'a Gido Village may have the potential for natural resources such as forests or agriculture that can be optimized to support sustainable development. In terms of local wisdom, Loloana'a Gido Village may have local wisdom that can be integrated with SDGs to achieve sustainable development and in terms of an integrated community, a cohesive village community with a spirit of mutual cooperation can be an important social capital to support the implementation of SDGs.
3. Strategy
   Based on the analysis of potential and challenges, a strategy needs to be developed to achieve the goals and targets of SDGs in Loloana'a Gido Village. Programs and activities need to be designed and implemented to achieve the SDGs goals. Periodic monitoring and evaluation are needed to ensure the effectiveness of the SDGs program and identify areas that need improvement. Collaboration between the village government, community, community organizations, and the private sector is essential to achieve the SDGs goals.

Analysis of the Village SDGs system is an important step to achieve sustainable development in Loloana'a Gido Village. By understanding the potential and challenges, developing the right strategy, and building strong collaboration, this village can achieve the SDGs goals and create a better future for all its citizens.

Based on the results of the interviews with the informants above, the researcher discussed the interview results based on the objectives of this study, namely

1. Village SDGs Implementation System in Loloana'a Gido Village

The implementation of Village SDGs in Loloana'a Gido Village is a complex process and involves various parties. The following are some important aspects in the implementation of Village SDGs:

a. Understanding and Mastery of Village SDGs
   The village government carries out socialization and education to residents. Village residents need to understand the goals of Village SDGs and how these goals are relevant to their lives. Effective socialization and education can be done in various ways, such as village meetings, training, and dissemination of information through local media. Furthermore, carrying out capacity development for village officials and residents involved in village development

activities. The village government, village officials, and the community need to have the capacity to plan, implement, and monitor programs that support Village SDGs. Training and mentoring can help increase their capacity.

b. Planning and Implementation
The village government carries out the Preparation of Village Development Plans (RKPDes) which are integrated with Village SDGs. RKPDes must contain targets and programs that are in line with the objectives of the Village SDGs. Developing priorities that are targeted by the village. The village can choose priority programs that are most relevant to local conditions and needs. These programs must be designed in a participatory manner, involving various stakeholders in the village. In the planning and implementation stages, the Loloana'a Gido Village Government utilizes local resources. The village can utilize local resources, such as natural, cultural, and human resource potential, to support the implementation of the Village SDGs.

c. Monitoring and Evaluation
At this stage, the Loloana'a Gido Village Government develops a monitoring and evaluation system. The village needs to have an effective monitoring and evaluation system to monitor the progress of the implementation of the Village SDGs. This system can involve measurable indicators that are relevant to the targets set. The monitoring and evaluation process is carried out transparently and accountably. The village community is involved in this process and is given access to information on the progress of the implementation of the Village SDGs.

The implementation of the Village SDGs is an ongoing process and requires a strong commitment from all parties. By involving the community, village government, and various stakeholders, and by optimally utilizing local resources, villages can achieve the Village SDGs targets and realize a better life for all its citizens.

Table 4 Results Of Reliability Test

Variable	Reliabilitas Coefficient	Cronbach Alpha	*Criteria*
Product Design	30	**0,773**	High
Process Design	30	**0,733**	High
Product Quality	30	**0,835**	High

Source: Data processed by researchers from SPSS 26 (2024)

From table 4, it can be seen that the results of the reliability test show that all variables show values greater than the Cronbach-alpha value of 0.60, so all can be said to be reliable or the instrument can be trusted and can be continued for further research. Interpretation of Regression Analysis

1. Multiple linear regression analysis is a statistical method used to analyze the relationship between one dependent variable and two or more independent variables. The goal is to determine how well the independent variables explain the variation in the dependent variable and to evaluate the contribution of each independent variable to the dependent variable, namely:
   a) Product Design: If the coefficient is significant and positive, it indicates that Product Design is related to increased Product Quality.

b) Process Design: If the coefficient is significant and positive, it indicates that Process Design is related to increased Product Quality.

By understanding the extent to which these two independent variables contribute, UD. Meto formulates a more appropriate strategy to improve product quality, for example by improving product design or adjusting the process design strategy according to consumer preferences

2. In this context, the constant value of 2.805 indicates the estimate of product quality at the zero point of the independent variables. In other words, when Product Design and Process Design are zero, the estimated product quality has a value of 2.805.
3. Product Design, with a coefficient of 0.518, indicates that every one-unit increase in this variable is followed by an increase in product quality of around 0.518, assuming that other independent variables remain constant. This provides an understanding that process design can positively affect the level of product quality.
4. Process Design also has a significant impact, with a coefficient of 0.630. This means that every one-unit increase in Process Design is followed by an increase in product quality of around 0.630, assuming that other independent variables remain unchanged. This indicates that an effective Process Design strategy can play an important role in improving product quality levels.
5. Overall, the results of the analysis show that Product Design and Process Design together and individually have a significant positive influence on product quality. These results provide a strong foundation for strategic decision making in improving product design and managing process design to strengthen product quality at UD. Meto. This regression analysis provides a deeper understanding of the relationship between these variables and provides an empirical basis for developing more effective production strategies.

CONCLUSION AND SUGGESTION

Based on the results of research conducted at UD. Meto on the influence of product design and process design on product quality, it can be concluded that:

From the results of the research instrument test, it can be concluded that there is an influence of product design and process design on product quality at UD. Meto so that the hypothesis in this study is accepted.The validity test of variables X1, X2 and Y is declared valid, where the calculated r result is greater than the r table, which is 361.

Reliability test of variable X is 0.642> 0.60, so that from the results of the reliability test of variable X whose alpha coefficient value is 0.691 it is declared reliable. Variable Y is 0.724> 0.60, so that from the results of the reliability test of variable Y whose alpha coefficient value is 0.724 it is declared reliable.

The correlation coefficient above, (rxy) item number 1 is obtained at 0.999% and for N = 30 at a significance level of α = 5%, the data obtained rtable = 0.361. By referring to the valid invalid criteria, item number 1 in the questionnaire with rxy of 0.999> 0.361 is concluded to be valid.Based on a simple linear regression test, the Significance (Sig.) Shows whether the coefficient of each independent variable is significant or not.

In this case, product design and process design are both significant at a significance level of 0.05. Product design has a significant influence on product quality at UD. Meto. This is reinforced by the T-statistic value of 3.058 and the P-value (Sig.) Of 0.005 which is smaller than alpha (0.05).

Therefore, improving product design can be an effective strategy to improve product quality.Process Design also has a significant influence on product quality at UD. Meto. The T-statistic value of 3.413 and the P-value (Sig.) of 0.002 indicate that process design plays an

important role in shaping product quality. Therefore, process design planning and strategy can improve the level of product quality.

Together, Product Design and Process Design have a positive and significant influence on Product Quality at UD. Meto. The results of the F-Statistic test of 37.769 and the P-value (Sig.) of 0.000 indicate that the combination of product design and process design has a greater impact on product quality.

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