The Effects of Responsibility and Empathy on Customer Satisfaction in Teaching Factory Learning

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Abstract: Vocational education encourages students to achieve competency in order to make students more prepared when joining the world. In order to achieve this goal, vocational education applies the model of a teaching factory. In factory learning, students are taught to provide direct services and products suitable for sale to general consumers or the public. Fundamental values such as responsibility, empathy, and cooperation in service to society are the keys to this learning. The research aims to determine the simultaneous influence of responsibility and empathy on customer satisfaction in teaching factory learning at UPJ Vehicle Engineering Vocational High School 1 Bendo. The research used a sample of 67 class XII students at Vocational High School 1 Bendo using a Likert scale questionnaire with instrument validity test results using V-Aiken and reliability testing using Cronbach alpha. The research uses multiple linear regression analysis for the independent variables (responsibility and empathy) and the dependent (customer satisfaction) variables. The results of the Anova significance research were 0.000, and the calculated F value was 358.402. Then, the R^2 value was 0.964. This shows that responsibility and empathy significantly influence customer satisfaction, with a percentage of 96.4%. Hopefully, this research can become the basis for further policy-making.

Abstrak: Pendidikan kejuruan mendonrong siswa untuk mencapai kompetensi guna menyiapkan siswa siap memasuki dunia kerja. Guna mencapai tujuan tersebut maka pendiidkan kejuruan menerapkan model pembelajaran teaching factory. Pada pembelajaran yang berbasis teaching factory, pelayanan jasa dan produk langsung layak jual kepada konsumen atau masyarakat umum diajarkan kepada siswa. Nilai-nilai dasar seperti tanggungjawab, empati, kerjasama dalam pelayanan kepada msayarakat menjadi kunci dala pembelajaran ini. Penelitian bertujuan untuk mengetahui pengaruh simultan responsibility dan empathy terhadap customer satisfaction pada pembelajaran teaching factory di UPJ Teknik Kendaraan Rinan SMKN 1 Bendo. Penelitian menggunakan sampel 67 siswa kelas XII di SMKN 1 Bendo dengan menggunakan kuesioner skala likert dengan hasil uji validitas instrumen menggunakan V-Aiken dan uji reliabilitas menggunakan cronbach aplha. Penelitian menggunakan analisis regresi linear berganda untuk dengan variabel indenepden (responsibility dan empathy) serta variabel dependent (customer satisfaction). Hasil penelitian signifikansi anova bernilai 0,000, kemudian nilai F hitung berada pada nilai 358,402 Kemudian nilai R^2 berada pada 0,964. Hal ini menunjukkan responsibility dan empathy berpengrauh signifikan secara simultan terhadap customer satisfaction dengan persentase sebesar 96,4%. Penelitian ini diharapkan mampu menjadi dasar pengambilan kebijakan selanjutnya.

A. Introduction

Vocational education aims to prepare students to join the world of work when they complete their education. The curriculum in vocational education emphasizes competency mastery. Vocational education encourages students to achieve competency in order to make students more prepared to join the world of work (Diwangkoro & Soenarto, 2020). Competencies taught in vocational education include theoretical, practical and entrepreneurial competencies. In developing entrepreneurial competencies, vocational education applies various learning models to support the achievement of these competencies. One learning model that is suitable for this is the teaching factory learning model. The Teaching Factory learning model combines school learning with industry (Irsyad & Effendi, 2023).

In factory learning, students are taught to provide direct services and products suitable for sale to general consumers or the public. The Teaching Thing Factory combined competency-based learning and model learning and training product production-based in their learning. The teaching factory program can run if the school's infrastructure and facilities meet standards for performing production activities in the form of services or goods through their educational program (Siswandi & Sukoco, 2016). In this model, students can practice production-based practices and service activities practised in real life and according to standard procedures in industries or the world of work (Wahjusaputri et al., 2020). Entrepreneurial values are applied in teaching factory learning, including the values of responsibility and empathy.

Responsibility in the Indonesian language means responsibility, but in terms of the work environment, it can also be interpreted as the ability to complete the work that has been started. Responsibility is an obligation of a unit or individual to carry out the tasks that have been given and apply to both employees and leaders (Azhari & Soepatini, 2024). The character of responsibility is an obligation to carry out or complete tasks that must be fulfilled, have consequences for failure, do the task as best as possible, not blame others if mistakes occur in carrying out the tasks assigned and focus on the goal to get maximum results by emphasize positive attitudes such as assisting people in need (Sari et al., 2022). To increase student responsibility can be improved through the use of learning management systems (Budiantara et al., 2023). By implementing a learning management system, students are trained to be quicker and more responsive to their responsibilities, as well as making students have a greater sense of responsibility to complete their tasks.

Empathy is the ability possessed by individuals to be able to feel what other individuals feel emotionally, thereby giving rise to motivation from individuals to help other individuals (Mallian et al., 2022). Empathy can be influenced by several factors, including age factors, socialization factors, gender factors, cultural factors, and other factors (Behm & Carter, 2021). Empathy means empathy given by workers or employees to consumers in the business world or work. Things related to empathy include having good relationships and understanding customer needs (Zaini, 2022). Empathy can be in the form of attention given by a company individually as a company effort to understand the wishes

and desires of customers or consumers. The company has to understand the customers' problems, act in the interest of the customers, provide personal attention to customers, and have comfortable operating hours (Setiawan, 2018).

According to Mahendra & Indriyani (2018), satisfaction is an emotional response from comparing anticipated results and the actual product received. Customer satisfaction refers to the emotional state in which an individual experiences satisfaction or satisfaction after evaluating a product based on their expectations and the actual performance of these products (Sasongko, 2021). Customer satisfaction is the result of excellent service in various business fields. Customer satisfaction is considered one of the market dimensions (Chandra & Tjiptono, 2021). The concept of customer satisfaction is that customers will feel satisfied if the service provided meets their expectations or is above their expectations but will feel very disappointed if the service provided does not meet their expectations (Samara & Susanti, 2023). Referring to the description above, customer satisfaction is very dependent on service quality, where service quality is closely related to the human resources who provide their service. One way to increase customer satisfaction is to improve human resources quality, which will affect the quality of service. In excellent service, the main goal is to create a sense of satisfaction from consumers. Customer satisfaction can increase by adding company values in the form of moral values and characteristics.

Vocational High School 1 Bendo implements Teaching Factory-based learning by providing services to customers consisting of the general public through the Production and Services Unit (UPJ). However, in practice, consumers still complain about the services provided by UPJ Light Vehicle Engineering. Customer satisfaction is still low, with service carried out by students concentrating on light vehicle engineering skills at Vocational High School 1 Bendo Magetan. The results of interviews with consumers in production units and light vehicle engineering businesses proved that 55% were not satisfied, 30% were satisfied, and around 15% of consumers were reluctant to give an assessment. Several previous studies examined the positive influence of responsibility and empathy on customer satisfaction.

Previous research Akila (2020) regarding studies on the influence of responsibility on performance explains that responsibility partially influences the performance of employees or workers. In previous research, we examined customer satisfaction with mechanical objects, whereas this research refers to vocational school students. Meanwhile, the research environment in schools is not in companies or industrial workshops. The significant difference is regarding the subjects studied, where the previous research subjects were trained workers. However, in this research, there is a novelty in that the subjects studied are students who provide direct services to customers.

Another research in the corporate sector by Azhari & Soepatini (2024) the results of this research are that Corporate Social Responsibility has a relatively positive and significant influence on the level of customer trust. In other cases, customer satisfaction is also considered positively and significantly influencing customer trust. Based on the explanation and various research previously carried out above, this study aims to determine the

influence of responsibility and empathy on customer satisfaction in community services in teaching factory learning. This research discusses corporate social responsibility in general but does not examine the responsibility of individuals or workers in general. The novelty in the research that will be carried out is regarding research carried out on individuals, not on the company as a whole. There has never been previous research that discusses the influence of responsibility and empathy together. There is research on responsibility, which influences customer satisfaction.

This research aims to determine the level of responsibility, empathy, and customer satisfaction in UPJ services teaching factory learning at Vocational High School 1 Bendo Magetan. More specifically, this research aims to test the correlation or substantial relationship between responsibility and empathy that students as business actors in the teaching factory have on customer satisfaction. Furthermore, the results of this research can be used as a means of evaluation and improvement for teaching factory learning.

B. Method

This study uses a quantitative research model with a correlational approach to determine one variable's influence on other variables. This study uses quantitative and descriptive research design where the research gets an overview from data collection and fact-finding and then analyses with interpretation with existing relevant theories. The variables in this research consist of the independent variables Responsibility (X1) and Empathy (X2), which are mentioned by the dependent variable Customer Satisfaction (Y). The population is students with a concentration in light vehicle engineering expertise at Vocational High School 1 Bendo. Based on the population size of 198 students, the sample taken was 67 students using the Slovin formula. This research was conducted in October-November 2024. The research design is drawn in Figure 1.
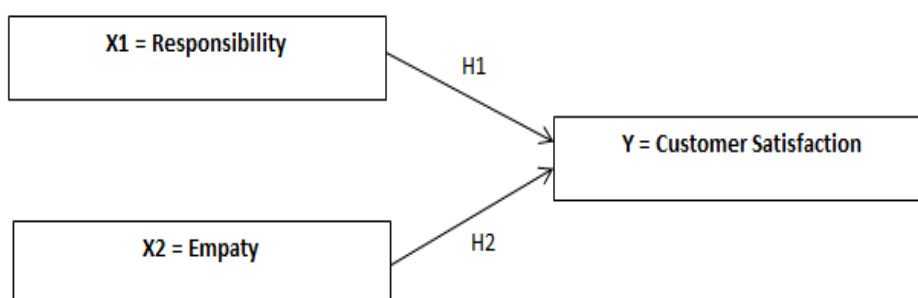

Figure 1. Research Design

The questionnaire is used to collect the data with a Likert scale of 1-5 options. This research was analyzed using descriptive analysis, analysis of correlation data between variables, and multiple linear regression techniques, using data obtained through validation sheets from material experts and users in the fields of learning models (teaching factory). Instrument validation is taken to count the content validity and empirical validity. The

content validity coefficient, which is shown below, was determined using the formulas of Aiken's V to determine the content validity coefficient.

Table 1. Instrument Validity Criteria

V Value	Validity Level
0,8 – 1,0	Very High
0,6 – 0,8	High
0,4 – 0,6	Moderate
0,2 – 0,4	Low
0,0 – 0,2	Very Low

The instrument reliability estimate is calculated using the standard Cronbach alpha index. So it is visible. The classification that shows the instrument's reliability level can be presented in the table below.

Table 2. Reliability Level of Cronbach Alpha

R-Value	Reliability Level
0,8 – 1,0	Very Reliable
0,6 – 0,8	Reliable
0,4 – 0,6	Moderate
0,2 – 0,4	Less Reliable
0,0 – 0,2	No Reliable

Data analysis was performed using descriptive statistical techniques. The interpretation of quantitative research data uses the guidelines in Table 3 below.

Table 3. Guide to Interpretation of Quantitative Research Results

Formula	Category
M+1,5SD < X	Very High
M+0,5SD < X ≤ M+1,5SD	High
M–0,5SD < X ≤ M+0,5SD	Moderate
M–1,5SD < X ≤ M-0,5SD	Low
X < M-1,5SD	Very Low

The research design or process starts with searching for initial research data to find out existing problems, then making research instruments, and then validating the instruments with experts. The next step is collecting research data on samples. After that, it continues by analyzing research data with the SPSS program and then finally drawing or drawing various conclusions according to the hypothesis or not from the analysis results that have been processed. This research design is depicted in the figure below.
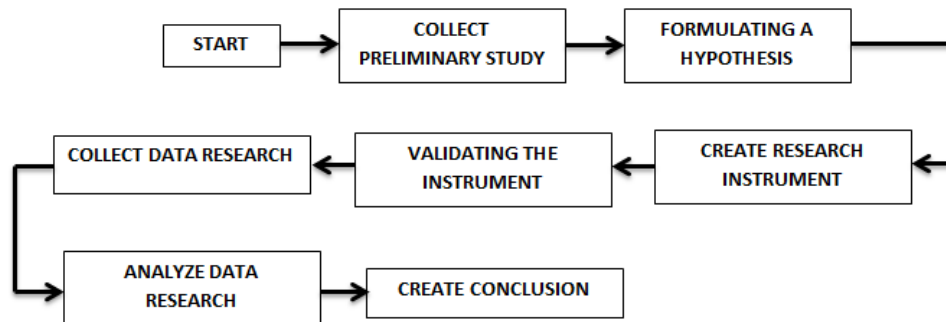
Figure 2. Research Flowchart

C. Result and Discussion
Result

Responsibility

The results of the research carried out in this study show that the average or mean value for the responsibility variable category was 29,56. Then, for the standard deviation, the value is 3,33. This variable was analyzed using the SPSS system, using the T-test to decide or specify the influence between responsibility and partial customer satisfaction so that the correlation could be seen whether it had an effect. The categorization of the research results is presented in Table 4 below.

Table 4. Interpretation of Responsibility

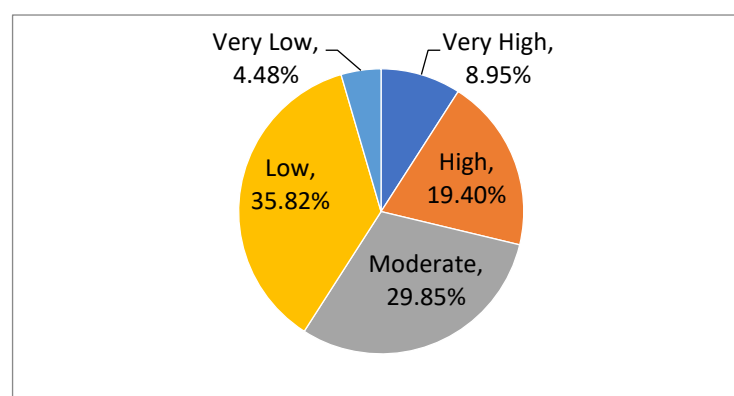| Category	Score Range	Percentage
Very High	$34,56 < X$	8,95 %
High	$31,23 < X \leq 34,56$	19,40 %
Moderate	$27,90 < X \leq 31,23$	29,85 %
Low	$24,57 < X \leq 27,90$	35,82 %
Very Low	$X < 24,57$	4,48 %
Total		100 %

Figure 3. Responsibility Level Percentage

Table 4 shows that the percentage of the responsibility category, which has a very low category, is 4.48%. The low category is 35.82%, the medium or medium category is 29.85%, the high category has a percentage of 19.40%, and the very high category has a percentage of 8.95%. The highest percentage was obtained by a low responsibility value of 35.82%.

Empathy

Based on this study's research, the average or mean value for the empathy variable category was 30,40. Then, for the standard deviation, the value is 3,41. This empathy was analyzed using the SPSS system, using the T-test to decide or specify the influence between empathy and partial customer satisfaction so that the correlation could be seen whether it had an effect. The categorization of the research results is presented in Table 5 below.

Table 5. Interpretation of Empathy

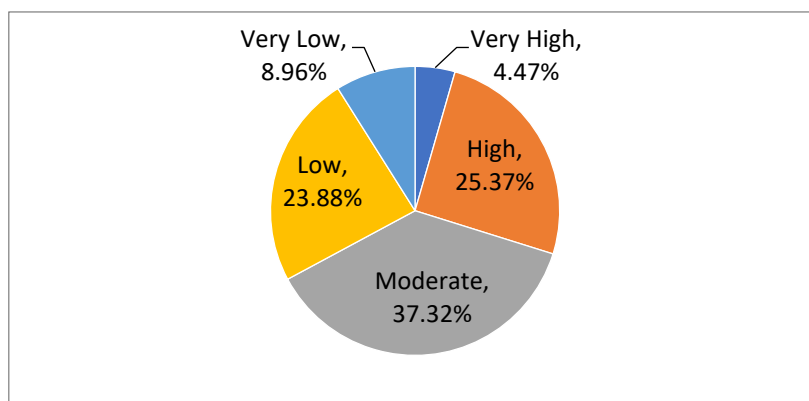| Category	Score Range	Percentage
Very High	35,52 < X	4,47%
High	32,11 < X ≤ 35,52	25,37%
Moderate	28,69 < X ≤ 32,11	37,32%
Low	25,27 < X ≤ 28,69	23,88%
Very Low	X < 25,27	8,96%
	Total	100 %

Figure 4. Empathy Level Percentage

Based on Table 5, we can see that the percentage of the empathy category with a very low category is 8.96%. The low category is 23.88%, the medium or medium category is 37.32%, the high category has a percentage of 25.37%, and the very high category istage of 8.96%. The highest percentage was obtained by a moderate responsibility value of 37.32%.

Customer Satisfaction

Based on the research results carried out in this study, the average or mean value for the customer satisfaction variable category was 30,03. Then, for the standard deviation, the value is 3,33. The categorization of the research results is presented six below.

Table 6. Interpretation of Customer Satisfaction

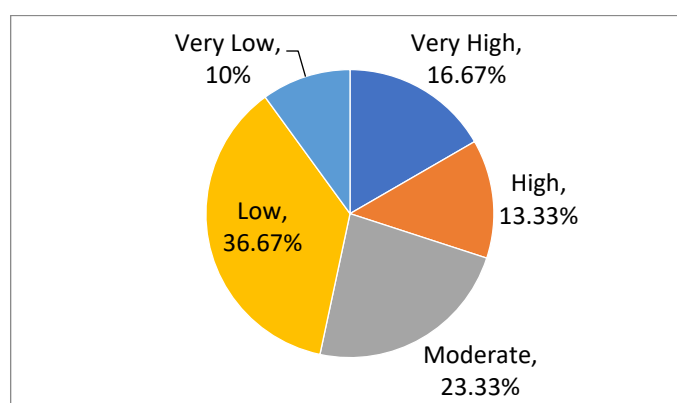| Category	Score Range	Percentage
Very High	$35,03 < X$	16,67 %
High	$31,70 < X \leq 35,03$	13,33 %
Moderate	$28,36 < X \leq 31,70$	23,33 %
Low	$25,02 < X \leq 28,36$	36,67 %
Very Low	$X < 25,02$	10 %
	Total	100 %

Figure 5. Customer Satisfaction Level Percentage

Based on Table 6, we can see that the percentage of the customer satisfaction category, which has a very low category, is 10%. The low category is 36.67%, the medium or medium category is 23.33%, the high category has a percentage of 13.33%, and the very high category has a percentage of 16.67%. The highest percentage was obtained by a moderate responsibility value of 37.32%.

The research results used the F and T-Test to determine the partial influence of the responsibility variable on customer satisfaction, the empathy variable on customer satisfaction, and simultaneously the responsibility and empathy variables on customer satisfaction.

The Effects of Responsibility on Customer Satisfaction

The outcome of the multiple linear regression analysis between responsibility and customer satisfaction is shown below. The data obtained is then analyzed using targeted linear analysis techniques to determine how big or whether there is a significant or insignificant influence between responsibility and customer satisfaction.

Table 7. The Effect of Responsibility on Customer Satisfaction

		Coefficients				
	Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.027	1.093		.940	.356
	Responsibility	.360	.071	.372	5.097	.000

a. Dependent Variable: Customer Satisfaction

Based on the calculation results of multiple simple linear regression analyses, the calculated t value is 5.097, whereas the t table value with a sample size of 67 is 1.667. If the calculated t value is > than the t table, then the dependent variable influences the independent variable. Then, the results of the significance calculation show that the significance value is 0.000. If the significance value is <0.05, there is a significant influence between the independent and dependent variables. Based on the calculated t value and significance, this shows a significant influence between responsibility and customer satisfaction.

The Effects of Empathy on Customer Satisfaction

The results of the multiple linear regression analysis between empathy and customer satisfaction are shown below. The data obtained is then analyzed using targeted linear analysis techniques to determine how big or whether there is a significant or insignificant influence between empathy and customer satisfaction.

Table 8. The Effect of Empathy on Customer Satisfaction

		Coefficients				
	Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.027	1.093		.940	.356
	EMPATHY	.605	.069	.642	**8.801**	**.000**

a. Dependent Variable: Customer Satisfaction

According to the calculation results, which count the multiple simple linear regression analysis, the calculated t value is 8,801, whereas the t table value with a sample size of 67 is 1,667. If the calculated t value is > than the t table, it can influence the independent variable on the dependent variable. Then, the results of the significance calculation show that the significance value is 0.000. If the significance value is <0.05, there is a significant influence between the independent and dependent variables. The calculated t value and significance show that empathy and customer satisfaction are significantly influenced.

The Effects of Responsibility and Empathy on Customer Satisfaction

The F test analyses the influence of two independent variables on the dependent variable. Below are the results of the F test to determine whether there is a significant influence between responsibility and empathy on customer satisfaction.

Table 9. Results of r^2

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.982a	.964	.961	.64752

a. Predictors: (Constant), Empathy, Responsibility

Based on the results of calculating r2, which is the percentage factor of the influence of the independent variable on the dependent variable. Table 5 shows that the r2 value is 0.964; this means that empathy and responsibility variables influence 96.4% of customer satisfaction. Meanwhile, the remaining 3.6% is influenced by other factors outside these variables.

Table 10. Results of ANOVA

ANOVAa						
	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regression	300.546	2	150.273	358.402	.000b
1	Residual	11.321	27	.419		
	Total	311.867	29			

a. Dependent Variable: Customer

b. Predictors: (Constant), Empathy, Responsibility

Based on the calculation results of multiple simple linear regression analyses, it is known that the significance value of X1 (responsibility) and X2 (empathy) towards Y (customer satisfaction) is 0.000. Suppose the significance value is <0.005, then the variables X1 and If the calculated F value > F Table, then there is an influence of X1 and X2 on Y simultaneously. The positive and significant influence percentage is also shown in the R squared value of 0.964. This shows that responsibility and empathy have an influence of 96.4% on customer satisfaction, while other factors influence the remaining 3.6%.

Discussion

Based on the percentage data regarding responsibility, empathy and customer satisfaction, the responsibility variable has the highest percentage at a low level, and the empathy variable has the highest at a medium level. The customer satisfaction variable is at a low level. The low level of responsibility has an impact on low customer satisfaction. This is supported by the results of the partial T-test and simultaneous F-test, where the variables responsibility and empathy have a positive simultaneous effect on customer satisfaction.

The higher the value of responsibility and empathy, the higher the level of customer satisfaction.

Responsibility is important for students in carrying out their role in teaching factory learning. Student's attitudes can be created from the teaching factory and behaviour following the world of work with responsibilities so that tasks are completed according to targets (Wahjusaputri et al., 2020). In reality, the field of teaching factory learning still leaves several problems; the values expected to appear in the teaching factory are low, such as the value of responsibility and empathy. According to several studies, a company's added value to increase customer satisfaction can be increased by increasing empathy and responsibility.

Optimal implementation of responsibilities can increase customer satisfaction. The responsibilities in question are in the form of company and personal responsibilities in carrying out their duties (Adila, 2023). Responsibility influences customer satisfaction because responsibility means meeting customer needs with appropriate and immediate action. Customers will feel satisfied if the service provided is as expected. Responsibility is not only held by students, but it is also the responsibility of teachers to instil responsibility (Nurhadi & Lyau, 2018). This responsibility is related to teacher competence.

Empathy has a huge role in customer satisfaction. In this research, it is explained that empathy has an important role in influencing customer satisfaction. This is also supported by research Setiawan (2018), which states that empathy positively influences customer satisfaction. Employees can show empathy to customers by wishing them a happy birthday, reminding them when routine service has arrived, and wishing them various holidays personally. Empathy has the `most significant role in influencing customer satisfaction (Haris, 2023). To provide maximum empathy towards customers, data is needed from consumers so that the form of empathy conveyed can be timely and on target. To increase students' sense of empathy, this can be done by making learning more inclusive (Iriyani et al., 2025).

Inclusive learning can increase students' sense of empathy with others because it has a higher intensity of communication. By understanding differences, students learn to appreciate, work together and support each other. They also learn to understand social, cultural, and background diversity. Reduce isolation and improve quality of life. Students with special needs can develop their social skills by interacting with peers. Prepare yourself to face a diverse world. Students learn to develop empathy, patience, and a deeper understanding of the lives and struggles of others.

Various factors, especially service factors, influence customer satisfaction. To increase customer satisfaction, excellent service, better known as excellent service, is needed (Maulyan et al., 2022). Excellent service, referred to in this case, is in the form of improving service relating to after-sales treatment and direct service provided by the company to customers. It was further explained that customer satisfaction is influenced by various factors, including product quality, price, service quality, emotional factors, cost, and convenience (Lonardi et al., 2021). The higher the quality of the product produced, the higher customer satisfaction, and the more excellent the quality of service provided, the

more customer satisfaction will increase. From an emotional perspective, customer satisfaction is also influenced by emotional factors; in this research, we discuss empathy. The higher the employee or company's empathy towards consumers, the higher customer satisfaction.

Customer satisfaction is an important factor that can be a determining factor in building and maintaining strong customer loyalty. According to Sasongko (2021), fostering customer loyalty through value creation tends to result in satisfaction with long-term customers and consequent rewards for the company. These statements are also relevant to the findings of other studies (Al-Ghamdi & Badawi, 2019), which determined that customer satisfaction has a noteworthy affirmative impact on loyalty. Customer satisfaction influences loyalty because satisfied customers will feel comfortable and not want to move elsewhere. They will continue to order again in the same and promote the company to other potential customers. Customer satisfaction can be created due to several factors: Service quality, customer value, and product excellence. Customer loyalty can have an impact on company profits and company survival.

Ultimately, customer satisfaction depends on the quality of service provided, both general and individual. On the individual employee side, the thing that influences customer satisfaction, according to Apriasty & Simbolon (2022), the research results is responsiveness. This relates to the readiness and the ability of its employees to have a sense of helping each other and other employees' consumers and the employee's ability to respond quickly and efficiently to requests then how they inform about when the service will be provided again according to the schedule and how the scheduled service can be carried out quickly and on time. Improvements in service quality are considered very influential or have a high influence on efforts to increase customer satisfaction; this is also justified by Subekhi & Hadibrata (2020), where the higher quality of employee service to customers, we can be sure that the higher level of customer satisfaction. To increase customer satisfaction by paying attention to service quality, management must always pay attention to what consumers want and need and organize regular training and development regarding excellent service for employees so that employees can always provide good service to customers (Suminar, 2017).

D. Conclusion

According to the results of a study used multiple linear regression analysis with independent variable data consisting of responsibility and empathy for the dependent variable, namely customer satisfaction, it can be concluded that partially responsibility has a significant effect on customer satisfaction, and empathy has an effect on customer satisfaction. Simultaneously, two variables, responsibility and empathy, have a simultaneous and very significant influence on customer satisfaction in the Light Vehicle Engineering teaching factory learning model, which is practising at Vocational High School 1 Bendo.

The results of this research can be used as a guide for other schools to improve quality learning, especially in teaching factories. Responsibility and empathy are important aspects that must continue to be improved to support increased customer satisfaction and impact customer loyalty. This result is supported by an R-squared value of 0.964, which means responsibility and empathy influence 96.4% of customer satisfaction, and other factors influence the remaining 3.6%.

In future research, it is recommended to conduct research with additional data in the form of interviews so that more valid data results can be obtained by combining two research methods, namely quantitative research and qualitative research. From the existing research results, it is necessary to improve the character learning taught to students placed in teaching factory learning. Student service at the teaching factory can be improved by improving character to increase customer satisfaction. This research references policymakers when making decisions and taking corrective steps in the future. It is also hoped that this research can be used to develop further similar research.

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