INFLUENCE OF CURBSIDE PUBLIC FACILITIES ON PASSENGER COMFORT AT RADIN INTEN II INTERNATIONAL AIRPORT, INDONESIA

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ABSTRACT
This study examines the influence of curbside facility services on passenger comfort at Radin Inten II International Airport, Lampung. Using a quantitative approach with 44 respondents, the study applied Spearman's Rank correlation and simple linear regression. Results indicate that all six facilities significantly affect passenger comfort, with charging stations showing the strongest influence ($\beta = 0.852$; $\varrho = 0.841$) and lactation rooms the weakest ($\beta = 0.399$; $\varrho = 0.373$). The findings suggest that improving curbside infrastructure in accordance with national standards is essential for enhancing passenger satisfaction.
Keywords: curbside facilities, passenger comfort, airport services, public infrastructure, service quality, Indonesia

INTRODUCTION

Air transportation is one of the most preferred modes of travel for its speed, efficiency, and safety. Airports are the first and last contact point affecting passengers' perception of service quality. According to [1] of ICAO, airports are areas for aircraft arrival, departure, and movement, including necessary facilities.

Radin Inten II International Airport in Lampung is a strategic provincial hub with steadily rising passenger numbers.. AMC data show departures increased from 340,861 in 2020 to 599,327 in 2024, and arrivals from 266,898 to 578,759, highlighting the need for improved airport infrastructure, especially curbside areas

The curbside area in front of the terminal is a key transition point affecting passengers' first impressions. On the Job Training at the Terminal Inspection Service found issues like missing FIDS, lactation room, charging stations, poor toilets, leaks, slippery floors, and inadequate prayer signage.

These findings contradict national service standards. According to Article 219 of Law No. 1 of 2009 on Aviation, airport operators are mandated to provide facilities that meet safety, security, and service standards. Furthermore, Ministerial Regulation [2] states that passenger services start at the departure curbside and continue into the terminal (PM 41/2023, Article 8). Articles 14 and 15 require essential facilities like AC, lighting, sanitation, information systems, toilets, lactation rooms, charging stations, and prayer areas for passenger comfort.

The importance of physical infrastructure in service perception is supported by [3], who state that *servicescape* elements such as layout, cleanliness, and information

signage significantly affect perceived service quality [4] also notes that a clean and well-maintained physical environment enhances psychological comfort and reinforces a positive service image. [5] emphasizes that comfort includes physical, environmental, and psychological dimensions that are directly influenced by public facilities.

Previous studies have also validated the role of curbside services in shaping passenger satisfaction and overall airport image [6] These studies suggest that the availability and quality of public-facing facilities significantly affect the overall travel experience and passengers' willingness to use the airport in the future.

This study examines how curbside facilities—such as information, cleanliness, and essential amenities—affect passenger comfort at Radin Inten II Airport. Using a quantitative approach, it evaluates compliance with national standards and the impact on service quality.

METHODS

This study adopts a quantitative descriptive approach to determine the influence of curbside facility services on passenger comfort at Radin Inten II Airport. According to [7] and [8] , quantitative research uses a positivist approach to analyze populations or samples, test hypotheses, and explain phenomena through numerical data and statistical techniques.

Research Variables

The variables in this study are divided into two types: independent variable (X) and dependent variable (Y). The ndependent variable (X) represents facility services in the curbside area, which include six measurable indicators.

These six components reflect key aspects

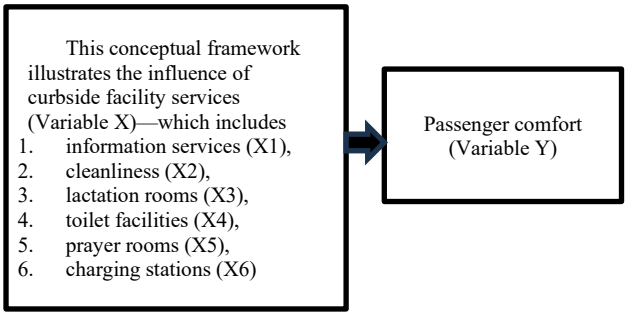

Figure 1 Conceptual framework of the study.

of passenger services

Mandated under Ministerial Regulation No. PM 41 of 2023, particularly Articles 14 and 15, which emphasize that comfort-related facilities must be available and accessible from the moment passengers arrive in the curbside area.

The dependent variable (Y) is passenger comfort, which refers to the subjective experience of safety, convenience, and satisfaction during the passenger's time at the airport. According to [5], it includes physical, environmental, psychospiritual, and sociocultural aspects, Meanwhile,[9] emphasize comfort as shaped by service quality and environment. Research Population and Sample

The population includes all users of the curbside area at Radin Inten II Airport, including departing passengers and those accompanying or picking them up.

Although the population varies in age, background, and purpose, no specific classification is made, as the study targets general service perceptions. AMC data shows 1,178,086 total passengers in 2024, or about 3,228 per day.

This study used random sampling to ensure unbiased and representative data. According to [10], *"Random sampling is characterized by giving all members of the population an equal chance to be selected as a sample randomly and without bias."* This

approach was deemed appropriate for capturing varied user perceptions within a large and heterogeneous population.

To determine the appropriate sample size, the researcher applied the Taro Yamane formula, which is commonly used in quantitative research involving large populations with random sampling. The formula is expressed as follows:

$$n = \frac{N}{N \,.\, d^2 + 1}$$

$$n = \frac{3228}{3228 \times (0{,}15)^2 + 1}$$

$$n = \frac{3228}{73{,}63}$$

$$n = 44$$

Research Instrument

This study used a structured (closed-ended)questionnaire to measure perceptions of curbside facility service quality at Radin Inten II Airport. A 4-point Likert scale was used to assess each item. This scale allows respondents to indicate their level of agreement with each statement, with the following score ranges:

Table 1 Likert Scale for Questionnaire Assessment

No	Symbol	Description	Score
1	4	Strongly Agree	4
2	3	Agree	3
3	2	Disagree	2
4	1	Strongly Disagree	1

The Likert scale is effective for measuring attitudes and evaluating service experiences. According to [11], it helps assess perceptions and opinions in service quality research.

Data Analysis Techniques

Questionnaire data were analyzed using SPSS v25 through several stages, including instrument testing and analysis of relationships between variables.

Validity Test

Validity, derived from the Latin word *validus* meaning "strong" or "robust," refers to the extent to which the conclusions drawn from research can be considered accurate and credible. According to [12], validity ensures that the research findings genuinely reflect the phenomena being studied and are not influenced by external factors.

Validity testing in this study was conducted using SPSS by employing the Pearson Product Moment and Corrected Item-Total Correlation methods to evaluate the accuracy and consistency of each questionnaire item in measuring its intended variable. With 44 respondents and a significance level of 5% (r table = 0.304), an item was deemed valid if the correlation coefficient (r hitung) or the Corrected Item-Total Correlation exceeded 0.304, indicating that the item effectively represents and contributes to the measurement of curbside facility service quality and passenger comfort.

Reliability Test

Reliability testing is conducted to assess the consistency and stability of a research instrument when measuring the same construct under consistent conditions. In this study, the Cronbach's Alpha method was used to evaluate the internal reliability of the questionnaire items.

An instrument is considered reliable if the Cronbach's Alpha (α) value exceeds 0.60. As stated by, [7] a reliability coefficient above 0.60 indicates that the instrument produces consistent results and can be trusted for repeated measurements.

As explained by [7],*" Spearman correlation is an analytical technique used to examine the strength of the relationship between two variables expressed in the form of rankings.*

The output from SPSS provides correlation coefficients which are interpreted based on the following scale [11]

Table 2 Interpretation of Correlation Coefficient (KK)

Correlation Coefficient (KK)	Interpretation
KK = 0.00	No Correlation
0 < KK ≤ 0.20	Very Weak Correlation
0.20 < KK ≤ 0.40	Weak Correlation
0.40 < KK ≤ 0.70	Moderate Correlation
0.70 < KK ≤ 0.90	Strong Correlation
0.90 < KK < 1.00	Very Strong Correlation
KK = 1.00	Perfect Correlation

Spearman's Rank Correlation

The Spearman Rank correlation test was used to examine the relationship between each independent variable (X1–X6) and the dependent variable (Y), namely passenger comfort. This test is appropriate because the data collected are in ordinal form using a Likert scale and do not necessarily follow a normal distribution. As such, Spearman Rank is a non-parametric alternative to Pearson correlation, suitable for analyzing monotonic relationships between ranked variables.

Normality Test

The Shapiro-Wilk test was conducted to verify whether the data were normally distributed, suitable for small sample sizes [13] Results indicated non-normality; hence, non-parametric tests were used.

Simple Linear Regression Analysis

This study uses simple linear regression analysis to measure the influence of each independent variable (X1–X6: information service, cleanliness, lactation room, toilet, worship facility, and charging station) on the dependent variable, passenger comfort (Y). This method is appropriate for examining causal relationships using quantitative data, where each predictor is tested separately. The analysis calculates the regression coefficient (β) and significance level (Sig.) to assess the strength and direction of influence and its statistical validity. This approach helps identify which facilities most significantly impact passenger comfort, supporting evidence-based airport service improvements.

RESULTS AND DISCUSSION

This section presents the results of the data analysis, which includes the findings from the validity test, reliability test, Spearman's Rank Correlation, normality test, and simple linear regression analysis. The data analysis was conducted using SPSS version 25.

1. **Validity Test**

The validity of the questionnaire items was tested using the Pearson Product Moment correlation and Corrected Item-Total Correlation. All items for the six independent variables (X1–X6) and the dependent variable (Y) exhibited correlation coefficients greater than the cut-off value of 0.304 at a 5% significance level. This indicates that each item is valid and effectively represents the construct it was designed to measure.

2. **Reliability Test**

The internal consistency of the questionnaire was assessed using Cronbach's Alpha.

Table 3 Reliability Test Results Based on Cronbach's Alpha

Variable	Cronbach's Alpha	Interpretation
Information Services	0.802	Good Reliability
Cleanliness	0.774	Acceptable Reliability
Lactation Room	0.820	Good Reliability

Availability		
Toilet Facilities	0.804	Good Reliability
Worship Facilities	0.753	Acceptable Reliability
Charging Stations	0.757	Acceptable Reliability
Passenger Comfort	0.829	Good Reliability

The Cronbach's Alpha values for all variables exceed the 0.60 threshold (Nunnally, 1978), which confirms that the instrument reliably measures the intended constructs.

Spearman's Rank Correlation

The non-parametric Spearman's Rank correlation test was used to determine the strength and direction of the association between each independent variable and passenger comfort. Table 2 summarizes the correlation coefficients.

Correlations

			Total_X1	Total_X2	Total_X3	Total_X4	Total_X5	Total_X6	Total_Y
Spearman's rho	Total_X1	Correlation Coefficient	1.000	.870**	.519**	.769**	.873**	.878**	.804**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000
		N	44	44	44	44	44	44	44
	Total_X2	Correlation Coefficient	.870**	1.000	.441**	.932**	.708**	.893**	.805**
		Sig. (2-tailed)	.000	.	.003	.000	.000	.000	.000
		N	44	44	44	44	44	44	44
	Total_X3	Correlation Coefficient	.519**	.441**	1.000	.451**	.476**	.438**	.373*
		Sig. (2-tailed)	.000	.003	.	.002	.001	.003	.013
		N	44	44	44	44	44	44	44
	Total_X4	Correlation Coefficient	.769**	.932**	.451**	1.000	.616**	.843**	.736**
		Sig. (2-tailed)	.000	.000	.002	.	.000	.000	.000
		N	44	44	44	44	44	44	44
	Total_X5	Correlation Coefficient	.873**	.708**	.476**	.616**	1.000	.699**	.646**
		Sig. (2-tailed)	.000	.000	.001	.000	.	.000	.000
		N	44	44	44	44	44	44	44
	Total_X6	Correlation Coefficient	.878**	.893**	.438**	.843**	.699**	1.000	.841**
		Sig. (2-tailed)	.000	.000	.003	.000	.000	.	.000
		N	44	44	44	44	44	44	44
	Total_Y	Correlation Coefficient	.804**	.805**	.373*	.736**	.646**	.841**	1.000
		Sig. (2-tailed)	.000	.000	.013	.000	.000	.000	.
		N	44	44	44	44	44	44	44

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Figure 2 Spearman's Rank Correlation Results between Independent Variables and Passenger Comfort

The analysis shows that all facility variables have a positive correlation with passenger comfort. Notably, charging stations (X6) show the highest correlation coefficient (ϱ = 0.841), indicating their critical role in influencing comfort, whereas lactation room availability (X3) presents the lowest correlation (ϱ = 0.373), suggesting a relatively smaller impact.

Normality Test

The normality test was conducted to determine whether the data obtained in this study followed a normal distribution, which is essential for selecting the appropriate statistical analysis technique. Given the sample size of fewer than 50 respondents, this study employed the Shapiro-Wilk test, which is recommended for small sample sizes.According to [13] *Data are considered to be normally distributed if the significance value (p-value) is greater than 0.05. Conversely, if the p-value is less than 0.05, the data are not normally distributed.*

The Shapiro-Wilk test was applied to each independent variable (X1–X6) to assess their distribution characteristics. The statistical analysis was performed using SPSS version 25, and the results are summarized as follows:

Table 4 Normality Test Results Using Shapiro-Wilk for Each Variable

Variable	Shapiro-Wilk Statistic	Sig. (p-value)	Distribution
Information Service	0.99975	100.000	Normal
Cleanliness	0.99841	0.99740	Normal
Lactation Room	0.99637	0.80631	Normal
Toilet Facilities	0.99726	0.93620	Normal
Worship Facility	0.99390	0.36405	Normal
Charging Station	0.99591	0.71980	Normal
Passenger Comfort	0.99591	0.67980	Normal

All variables yielded p-values greater than 0.05, indicating that the data for each variable follow a normal distribution. These results validate the use of parametric or non-parametric tests depending on further

analytical objectives, but confirm that normality is not a concern for this dataset.

3. ***Simple Linear Regression Analysis***

To evaluate the influence of each curbside public facility service variable (X1–X6) on passenger comfort (Y), a simple linear regression test was conducted for each independent variable. The results are as follows:

Information Services (X1) on Passenger Comfort (Y)

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	3.182	1.954		1.629	.111					
	Total_X1	.861	.105	.783	8.165	.000	.783	.783	.783	1.000	1.000

a. Dependent Variable: Total_Y

Figure 3 Simple Linear Regression Result of X1 (Information Services) on Y (Passenger Comfort)

The regression analysis of X1 showed a standardized coefficient (Beta) of 0.783 with a significance value (p) of 0.000, which is lower than 0.05. This result indicates a strong and significant positive effect of information services on passenger comfort. The t-value of 8.165 further confirms this relationship. Thus, the better the information services provided at the curbside, the higher the perceived comfort of passengers.

Cleanliness (X2) on Passenger Comfort (Y)

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	3.609	2.176		1.658	.105					
	Total_X2	.806	.113	.740	7.126	.000	.740	.740	.740	1.000	1.000

a. Dependent Variable: Total_Y

Figure 4 Simple Linear Regression Result of X2 (Cleanliness) on Y (Passenger Comfort)

The regression result for cleanliness shows a Beta value of 0.740 and a significance level (p) of 0.000. With a t-value of 7.126, this demonstrates that cleanliness has a strong and statistically significant influence on comfort. It highlights that the cleanliness of curbside areas directly contributes to a better passenger experience.

Lactation Room (X3) on Passenger Comfort (Y)

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	11.222	2.982		3.763	.001					
	Total_X3	.399	.152	.375	2.621	.012	.375	.375	.375	1.000	1.000

a. Dependent Variable: Total_Y

Figure 5 Simple Linear Regression Result of X3 (Lactation Room) on Y (Passenger Comfort)

The Beta coefficient for the lactation room variable is 0.375, with a p-value of 0.012,

which is still below the 0.05 threshold. Although the effect is statistically significant, the influence strength is moderate compared to other variables. This suggests that the availability and condition of lactation rooms moderately support passenger comfort, particularly for passengers traveling with infants.

Toilet Facilities (X4) on Passenger Comfort (Y)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity St
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance
1	(Constant)	4.932	2.385		2.067	.045				
	Total_X4	.726	.122	.676	5.942	.000	.676	.676	.676	1.000

a. Dependent Variable: Total_Y

Figure 6 Simple Linear Regression Result of X4 (Toilet Facilities) on Y (Passenger Comfort)

Toilet facilities have a Beta of 0.676 and a p-value of 0.000, indicating a strong and significant effect on passenger comfort. The t-value of 5.942 reinforces this. Toilets that are clean, accessible, and properly maintained are crucial for enhancing overall comfort during transit.

1) **Worship Facilities (X5) on Passenger Comfort (Y)**

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	3.546	3.092		1.147	.258					
	Total_X5	.783	.156	.612	5.019	.000	.612	.612	.612	1.000	1.000

a. Dependent Variable: Total_Y

Figure 7 Figure 5. Simple Linear Regression Result of X5 (Worship Facilities) on Y (Passenger Comfort)

Worship facilities scored a Beta of 0.612 and p-value of 0.000, with a t-value of 5.019. This indicates a moderately strong and significant influence on comfort. Such facilities support the spiritual and psychological well-being of passengers, which is essential, especially in a culturally and religiously diverse country like Indonesia.

Charging Station (X6) on Passenger Comfort (Y)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.280	2.350		.970	.338					
	Total_X6	.852	.119	.741	7.160	.000	.741	.741	.741	1.000	1.000

a. Dependent Variable: Total_Y

Figure 8 Simple Linear Regression Result of X6 (Charging Station) on Y (Passenger Comfort)

Charging stations recorded the highest Beta value of 0.741 with a significance level of 0.000 and a t-value of 7.160. This suggests that charging stations are the most dominant factor influencing passenger comfort. With increasing reliance on electronic devices, charging accessibility is perceived as a critical service.

3.1 Discussion

This section discusses the influence of each curbside facility variable (X1–X6) on passenger comfort (Y), using statistical results and theoretical perspectives. The discussion interprets the strength, significance, and implications of each variable based on the correlation and regression analysis.

X1: Information Services

According to [3], *tangible cues such as signage and real-time information systems influence perceived service quality by reducing uncertainty and increasing user confidence.* This finding supports the observation that the absence of a Flight Information Display System (FIDS) at Radin Inten II Airport leads to confusion and discomfort for passengers (TIS Documentation, 2025).

The high β-value (0.861) also indicates that improvements in this facility would yield a substantial increase in perceived comfort, highlighting its strategic importance for airport management.

X2: Cleanliness

As stated [9], *clean and orderly environments enhance user satisfaction by providing psychological security and physical comfort.* Observational data from the TIS report noted recurring issues such as slippery floors and water leaks during rain in the curbside canopy area, which contribute to discomfort and safety risks. These findings align with the high statistical values obtained and confirm the urgent need for infrastructure repairs and regular maintenance routines.

X3: Lactation Room Availability

This is likely due to the specific demographic characteristics of passengers who may not be traveling with infants or nursing children. Nevertheless,[5] emphasizes that *comfort must be inclusive, addressing diverse physical and emotional needs of all service users.* The absence of this facility, as confirmed during field observations, reflects a gap in compliance with PM 41 of 2023, which mandates the provision of lactation rooms in public terminal zones.While the effect is limited on general comfort perception, its availability remains critical for accessibility and service equity.

X4: Toilet Facilities

According to [10], *public restrooms serve as hygiene indicators and are often used as benchmarks for facility quality in transport terminals.* Field observations at Radin Inten II Airport noted that toilets in the curbside area were not fully operational and lacked proper maintenance.

The high statistical impact reflects passengers' demand for clean, accessible, and well-maintained toilet facilities, reinforcing the urgency to upgrade this service area in accordance with national standards.

X5: Worship Facilities

Ministerial Regulation No. 41 of 2023 emphasizes the inclusion of religious service spaces in public areas, especially in culturally diverse societies. However, according to TIS documentation, access to prayer rooms was not well signposted, and in some cases, the rooms were not accessible from the curbside. This result indicates that visibility, signage, and access to prayer facilities significantly affect comfort perception, especially for passengers who seek spiritual readiness before departure.

X6: Charging Station

In the digital age, where passengers rely on mobile devices for boarding, communication, and navigation, the ability to charge devices becomes a critical need. As noted by [3], *modern service quality is increasingly defined by the availability of technology support infrastructure.*

Field observations confirmed that no charging stations were available in the curbside area, which created frustration among travelers. The extremely high β-value reflects the urgency of implementing this facility to meet the expectations of tech-reliant passengers.

CONCLUSION

This study, involving 44 respondents, investigated the impact of curbside facility services on passenger comfort at Radin Inten II International Airport, Lampung, using a quantitative descriptive approach. All six variables—information services, cleanliness, lactation rooms, toilets, worship areas, and charging stations—showed a positive and significant effect on comfort, with charging stations ($\beta = 0.852$; $\varrho = 0.841$) being the most influential, followed by information services and cleanliness. The lactation room had the least impact, suggesting limited relevance to most passengers. These findings highlight

the importance of digital accessibility and environmental quality, support regulatory standards (Ministerial Regulation No. 41 of 2023), and align with service quality theories linking infrastructure to psychological comfort.

REFERENCES

[1] I. C. A. Organization, *Aerodromes Annex 14 to the Convention on International Civil Aviation Volume 1: Aerodrome Design and Operations*, 5 ed. ICAO, 2009.

[2] Republic of Indonesia. (2023). *Regulation No. PM 41 of 2023 on Airport Services at Airports*.

[3] Zeithaml V. A. Bitner M. J. & Gremler D. D., *Services Marketing: Integrating Customer Focus Across the Firm*, (7th ed.). McGraw-Hill Education., 2018.

[4] Kotler P., *Atmospherics as a marketing tool*, 49(4). Journal of Retailing, 1973.

[5] Kolcaba K, *Comfort Theory and Practice: A Vision for Holistic Health Care and Research*. New York: Springer Publishing Company., 2003.

[6] Adiwangsa, A. F., & Azhar, H. P. O. (2023). The Effect of Services at Curb Area on the Image of Lombok International Airport. *Jamparing: Jurnal Manajemen dan Pariwisata*, 1(2).

[7] Sugiyono. (2013). *Quantitative, Qualitative, and R&D Research Methods*. Bandung: Alfabeta.

[8] Arikunto, S. (2010). *Research Procedure: A Practical Approach* (Revised ed.). Jakarta: Rineka Cipta. [in Indonesian]

[9] K. L. Kotler, P., & Keller, *Marketing Management*, 15 th edit. pearson, 2016.

[10] Hardani, et al. (2020). *Qualitative and Quantitative Research Methods*. Yogyakarta: Pustaka Ilmu.

[11] Sugiyono. (2019). *Quantitative, Qualitative, and R&D Research Methods*. Bandung: Alfabeta.

[12] Purba, Y. O., & Fadhilaturrahmi. (2021). *Instrument Testing Techniques for Educational Research*. Bandung: Widina Bhakti Persada.

[13] Ghozali, I. (2016). *Multivariate Analysis Application with IBM SPSS 23*. Semarang: Diponegoro University Publisher.