

User satisfaction level of parking space facility: a case of Faculty of Geography, Universitas Gadjah Mada, Indonesia

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Abstract. Every vehicular trip starts and finishes at a parking lot. Therefore, the availability of parking space has to meet the demand of vehicle users so that their activities can be performed smoothly and in time. The needs for parking space in Faculty of Geography tend to increase from year to year due to the increasing use of private vehicles in the faculty. This research aimed to identify the user satisfaction level of the parking space in Faculty of geography and to understand the influence of the parking facility on user satisfaction level. It was survey research because it took samples from a population and used a list of questions as a data collection tool. The data was analyzed quantitatively with descriptive statistics. The satisfaction level was calculated according to an existing regulation, namely the Decree of the Indonesian Minister of Administrative and Bureaucratic Reform No. Kep/25/M.PAN/2004 about General Guidelines for the Assessment of Community Satisfaction Index of Public Service Unit.

The results showed that the mean user satisfaction level of the parking facility and each of its elements were good. In other words, the parking facility was already good in each element. Therefore, the faculty should focus the improvement on making it better.

1. Introduction

Performing an activity requires mobilization, and, for this purpose, vehicles are essential. Without regard to the diverse use of a vehicle, parking lots are necessary for smoothly and punctually running activities in a daily basis. Its availability is inseparable from its setting, layout, and effective capacity, as well as parking service quality, all of which play a role in optimizing parking facilities [6]. Available parking facilities are urgently needed because the use of private vehicles in the Special Region of Yogyakarta increases every year [1].

The Decree of the Indonesian Minister of Transportation No. 66/1993 on Public Parking Facilities explains that:

- a. Parking is a condition representing non-moving vehicle of a non-temporary nature;
- b. Parking facilities outside the roadways are built specially in the form of a parking area (outdoor) and/or a parking building (indoor); and
- c. Public parking facility is outside the roads and in the form of a parking building (indoor) and/or a parking area (outdoor) developed as a stand-alone business that provides public parking services.

This decree also describes the requirements for a public parking facility, namely:

- a. A public parking facility can ensure the safety and smoothness of traffic;
- b. It is easily accessible by users;
- c. For indoor parking lot, it has to meet the construction requirements by the applicable laws and regulations;
- d. For outdoor parking lot, it must have certain limits;



- e. The circulation and position of parking vehicles in either indoor or outdoor parking lots are arranged using traffic signs or road markers; and
- f. Every space used for parking vehicle is marked with letters or numbers so that users can easily find their vehicles.

According to [8], the service quality, as perceived by users, can be identified with a set of customer satisfaction indicators that include five dimensions of service quality. These dimensions, as well as their sub-dimensions, are as follows:

- a. Tangibles (service quality in the form of physical office, computerized administration, waiting room, and information center or point). This dimension represents the modernity of the equipment, the attractiveness of the facilities, the neatness of the officers, and the completeness of the supporting equipment (pamphlet or flowchart).
- b. Reliability (ability to provide reliable services). This dimension is a guarantee that the parking facility can accomplish the desired objectives, facilitate user complaints, perform the right services, provide timely services (as promised), and demand for recording errors.
- c. Responsiveness (the ability to help and provide services quickly and precisely and be responsive to what customer desires). This dimension includes, for instance, a notification from the employees to users about the services provided, fast delivery of the services, and the willingness of the employees to assist users (officers are never too occupied to serve user's demand).
- d. Assurance (hospitality, or the ability of employees in courteously ensuring the confidence of users in the services). This dimension is related to the behavior of the employees (confidence in providing services to users), the user's sense of security, and the ability (knowledge) of the employees to answer questions from users.
- e. Empathy (firm but attentive attitude towards users). This dimension includes, for instance, individual and particular attention from employees to users, a timely service process for all users, and profound services from the employees provided through an understanding of the specific needs and desires of users.

This study focused on motor vehicle parking facilities in Faculty of Geography, Universitas Gadjah Mada, which is located in Sekip Utara, Bulaksumur, Sinduadi District, Sleman Regency. This faculty is one of the educational institutions in Universitas Gadjah Mada that are equipped with parking lots as a supporting facility for campus operation. Therefore, vehicle parking facilities are expected to efficiently help smooth the teaching-learning process, which is the core of the faculty's operation. The effectiveness of parking facilities is inseparable from the layout, capacity, and services of the parking lots provided by the faculty.

The objectives of this study were as follows:

1. To identify user satisfaction level with the parking facility in Faculty of Geography; and
2. To analyze the effect of the parking facility in Faculty of Geography on the satisfaction level

2. Method

This study was survey research because it took samples from a population. It used both quantitative and qualitative method. The analysis unit was user individuals as it fitted the context of this research, namely user satisfaction with parking service quality. The population was the users of the parking lots in Faculty of Geography UGM, which consisted of lecturer, employee, and student of the faculty. The respondents were sampled randomly according to the unit area of each parking service.

The research data were collected using two sampling techniques, namely simple random sampling and purposive sampling. These methods were employed due to the large population in this research. Purposive sampling means that the population does not have the same opportunity to be selected as a sample due to the several criteria developed according to the research objectives. In other words, it uses particular considerations that are relevant or can represent the purpose of a study [7].

The data collection tool in this study was a questionnaire, complemented by direct observations to obtain more in-depth picture of the parking lot condition. There were two sets of population acquired in this research, namely executors or managers and parking facility users. Due to the large population of the parking lot users, the respondents were selected using simple random sampling. Meanwhile, the purposive sampling on the population aimed to find more details about the implementation of parking facilities in the faculty. There were roughly 1,500 vehicle users in the faculty. Based on the Morgan table, the sample size with 95% confidence level is 306. The detail of the samples is presented in table 1.

Table 1. Number of respondents by status and type of vehicle.

Vehicle Types	Status				Total	Percentage
	Students	Lecturers and Staffs	Guests	Others		
Motorcycle	244	17	6	4	271	88.9 %
Car	14	9	0	0	23	7.5 %
Bicycle	9	1	0	0	10	3.3 %
Others	1	0	0	0	1	0.3 %
Total	268	27	6	4	305	100 %

The research data were analyzed using a descriptive statistic method. It is one of the scientific ways of collecting, presenting, and analyzing data with actual figures whose basis can be justified to find the correct conclusion. The satisfaction level was calculated according to the Decree of the Indonesian Minister of Administrative and Bureaucratic Reform No. Kep/25/M.PAN/2004 on General Guidelines for the Assessment of Community Satisfaction Index of Public Service Unit. The indicators adopted from the decree are presented in table 2.

The user satisfaction with the parking facility was calculated using the "weighted average value" of each service provided by the facility. The formula is as follows (eq. 1).

$$\text{Weighted average value} = \frac{\text{Total weight}}{\text{Number of elements}} = \frac{1}{17} = 0.058 \quad (1)$$

Furthermore, the Public Satisfaction Index was obtained from the weighted average value with the following formula (eq. 2).

$$\text{Public Satisfaction Index} = \frac{\text{Total values per item}}{\text{Number of elements}} \times \text{Weighted average value} \quad (2)$$

The Public Satisfaction Index ranges from 1 to 5.01. To facilitate its interpretation regarding the quality service and service unit performance of the parking facility (table 3), this index was multiplied by a base value of 20. The formula is as follows (eq. 3).

$$\text{Public Satisfaction Index} \times 20 \quad (3)$$

Table 2. Satisfaction level indicators.

Nr.	Indicators	Sub Indicators
1	Service procedure	<ul style="list-style-type: none"> • The level of information disclosure regarding the service procedure • The level of clarity on the flow in the service procedure
2	Terms of service	<ul style="list-style-type: none"> • The level of simplicity of the service procedure • The level of openness regarding the terms of service • The level of convenience in maintaining and meeting the service requirements
3	Clarity of service employees	<ul style="list-style-type: none"> • The level of clarity regarding terms of service • The level of certainty about the identity and responsibility of the service employees • The level of ease in meeting and contacting the service employees
4	The discipline of service employees	The ability of the employees in completing services promptly
5	Responsibilities of service employees	<ul style="list-style-type: none"> • The level of clarity of employees' responsibility • The level of assurance of employees' responsibility • The level of disclosure of employees' responsibility
6	The ability of service employees	<ul style="list-style-type: none"> • The level of physical ability. • The level of employees' intellectual capacity.
7	Speed of service	<ul style="list-style-type: none"> • Time efficiency in performing the desired services • The level of openness of service completion time
8	Service equality	<ul style="list-style-type: none"> • The level of service equality to all users • The extent of the coverage of service delivery
9	Courtesy and hospitality of employees	<ul style="list-style-type: none"> • The level of courtesy and friendliness of the service employees • The level of respect from employees for users
10	Fairness of service charge	-
11	The certainty of service charge	-
12	The certainty of the service schedule	<ul style="list-style-type: none"> • The clarity of the service schedule • The level of service schedule's reliability
13	Environmental comfort	<ul style="list-style-type: none"> • The level of cleanliness and neatness of the environment where the services are offered • The availability level of service support facility. • The level of completeness and update of service facilities and infrastructure.
14	Safety and security	<ul style="list-style-type: none"> • The level of safety of the facilities • The level of security in the use of facilities and infrastructure services

Table 3. Perception values, public satisfaction index, converted public satisfaction index, service quality, and service unit performance.

Perception Values	Intervals of Public Satisfaction Index	Intervals of Converted Public Satisfaction Index	Quality of Service	Service Unit Performance
1	1.00 – 2.00	20.00 – 40.00	D	Very Bad
2	2.01 – 3.00	40.01 – 60.00	C	Bad
3	3.01 – 4.00	60.01 – 80.00	B	Good
4	4.01 – 5.01	80.01 – 100.00	A	Very Good

3. Results and Discussion

3.1. User satisfaction level with the parking facility in the Faculty of Geography UGM

The user satisfaction level was calculated from the value of each element, which was adopted from the Decree of the Indonesian Minister of Administrative and Bureaucratic Reform No. Kep/25/M.PAN/2004 on General Guidelines for the Assessment of Community Satisfaction Index of Public Service Unit. Meanwhile, the value of each element was derived from users' assessment of each element of the parking facility. The results are summarized in table 4.

Table 4. User satisfaction level with each element of the parking facility in Faculty of Geography UGM.

Questions	Value Per Element	Descriptions
Disclosure of information on parking service procedure	3.06	Good
The clarity of the flow in the parking service procedure.	3.01	Good
The simplicity of parking service procedure	3.73	Good
The ease/convenience of parking service procedure	3.80	Good
Certainty about the identity and responsibilities of service employees	2.98	Bad
The ease of meeting and contacting service employees	3.66	Good
Discipline in providing the services	3.47	Good
The responsibilities of employees in providing services	3.68	Good
Equal treatment to all users (to receive services)	3.89	Good
The evenness of coverage in service delivery	3.50	Good
The ability (physical and intellectual) of employees in providing services	3.90	Good
The attitude (courtesy and friendliness) of employees in providing services	3.73	Good
the conformity between the service implementation with the established standards	3.21	Good
The cleanliness and neatness of the parking lot	3.09	Good
The availability of supporting facilities	2.80	Bad
The completeness and update of service facilities and infrastructures	2.66	Bad
The safety and security of the parking facility	3.28	Bad

Table 4 showed that 13 (out of 17) elements observed in this study were in a good category. These elements were information disclosure on parking service procedure, parking service procedure, the simplicity of parking service procedure, the ease of parking service procedure, the ease of finding and contacting the service employees, discipline in the services, the responsibility of employees to provide services, equal treatment to all users (to receive parking service), the evenness of the coverage in service implementation, the ability (physical and intellectual) of employees in providing services, the attitudes of employees in providing services, the conformity between the service implementation with the established standards, and the cleanliness and tidiness of the parking lot. On the contrary, the other four elements were categorized by the respondents as either bad or very bad. These elements were the certainty about the identity and responsibilities of service employees, the availability of supporting facilities, the completeness and update of service facilities and infrastructures, and the safety and security of the facilities.

Furthermore, the overall user satisfaction level was calculated by summing the value of each element and multiplying it by the weighted average value (0.058). This calculation yielded an index of 3.38, which was multiplied by a base value of 20. The result of this multiplication was a Converted User Satisfaction Index of 74.37, indicating a B-grade or good service quality.

3.2. The impact of parking facility on user satisfaction level

The Special Region of Yogyakarta is renowned as the city of students. This title makes people with interest in science from Indonesia and other countries choose Yogyakarta as their academic destination. As a consequence, the number of vehicles in Yogyakarta increases from year to year, as seen in figure 1.

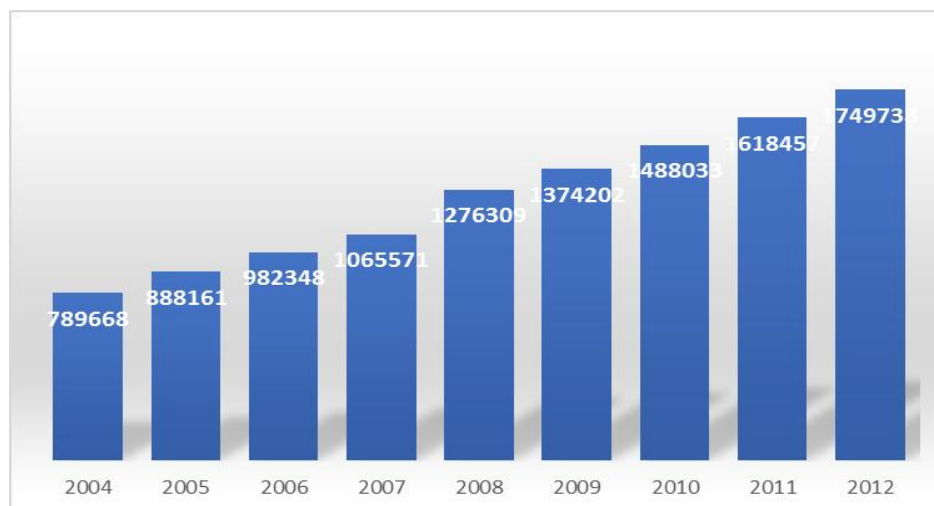


Figure 1. The number of registered motor vehicle users in the Special Region of Yogyakarta.

Universitas Gadjah Mada is one of the many educational means in the Special Region of Yogyakarta. Its Faculty of Geography also contributes to the rising trend of the number of motor vehicles. Therefore, parking facilities should be provided by every academic service that has high mobility. The manager is expected to offer parking services so that the vehicles can enter to and leave from the faculty neatly and conveniently. This study assessed the 17 elements of user satisfaction based on the users' perception of the services provided by the parking facilities in the Faculty of Geography.

The manager had prepared a plan for the development of parking facilities to be comfortable, orderly, and safe. This plan included the construction of the facilities, which, according to the manager, had currently caused some inconvenience to parking lot users in the faculty. Due to the unrealized plan to develop a single parking facility in the university, instead of one facility in every faculty, the construction of on-site parking lots in the Faculty of Geography continued. Physical improvements would likely continue in the form of road blocking, CCTV installation, plan development, and road sign and lighting installation. There was another plan to arrange the layout of parking space by type of vehicle for a more systematic and comfortable parking lot utilization by students, lecturers, employees, and guests.

The results showed that each element was perceived as good by the users, indicating a good facility as a whole. If an element is good, a further development likely emphasizes on making it better. On the contrary, if an element receives a bad rating from users, then further improvement has to analyze the cause of such assessment first. In this case, researchers can design open-ended questions for identifying the arguments or reasons behind the poor and very-poor rating of an element given by users.

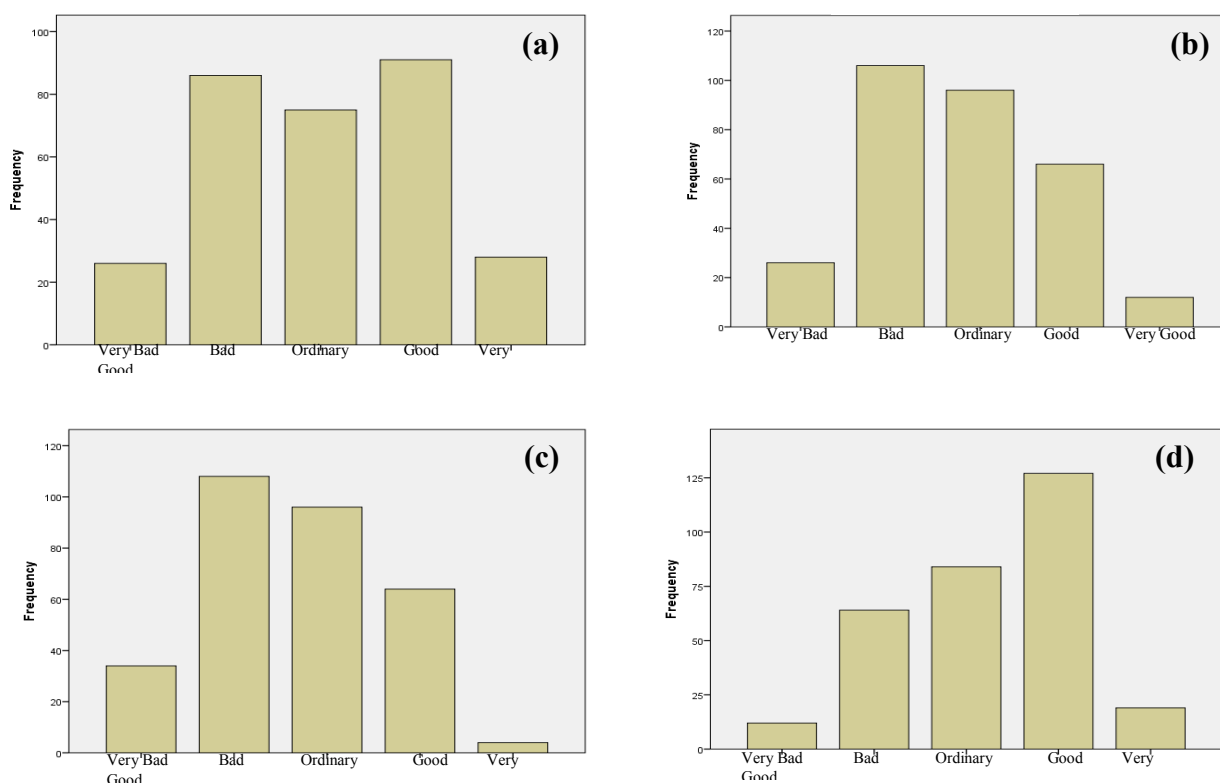


Figure 2. The frequencies of elements with averagely bad and good rating: (a) the certainty of the identity and responsibilities of employees, (b) the availability of supporting facilities, (c) the quality and completeness of facility and infrastructure, and (d) safety and security.

Regarding the identity and responsibility of the employees of the parking facility in the Faculty of Geography (figure 2a), on average the respondents gave an unsatisfactory rating with the element value of 2.98. Their identity was still difficult to distinguish from employees in other departments because there was no unique identification. Based on direct observation in the field, they did not wear uniforms unlike the security personnel in the faculty. Also, the lack of information on the shift schedule of the employees was perceived as a difficulty for parking lot users when they needed

assistance. As an effort to improve the parking service in the faculty, the respondents suggested the provision of information boards containing the personal data of the employees in charge of a particular shift along with their responsibilities.

Regarding the availability of supporting facilities (figure 2b), on average the respondents gave a poor rating with the element value of 2.80, categorized as bad service quality. Some of the shortcomings expressed by the respondents were the lack of CCTV monitoring, minimum lighting, non-roof parking space, uncomfortable access to parking lots (i.e., bad drainage), frequently changed parking signs and markers, and poorly functioning parking barrier gates. The respondents expected the existing development and improvement to be able to resolve these inconveniences.

Regarding the completeness and the extent of facilities and infrastructures (figure 2c), on average the respondents gave a poor rating with the element value of 2.66, categorized as bad service quality. The respondents complained the impractical use of parking tickets that aimed to calculate the number of vehicles entering to and leaving from the faculty. Moreover, the license plate written on the ticket was never checked accurately against the vehicles passing through the barrier gates. Other complaints were the minimum of the security, modern parking facilities (the parking service was still conventional), lighting, and parking signs and markers, as well as the poorly functioned automatic barrier gates. As an effort to improve the parking services in the faculty, the respondents suggested a parking system similar to the one implemented at the UGM Central Library.

Regarding the safety and security of the parking lots (figure 2d), on average the respondents gave a good rating, with the element value of 3.28, categorized as a good service quality. According to some of the respondents, the security of the parking facility in the faculty was fair except for the outdoor parking lot. There has been rampant theft of helmets and motorcycles, which was a worrisome problem, especially to the users. The less-than-optimal security coverage could be improved by monitoring remote parking lots and installing CCTVs to control the security of the parking lots in the faculty.

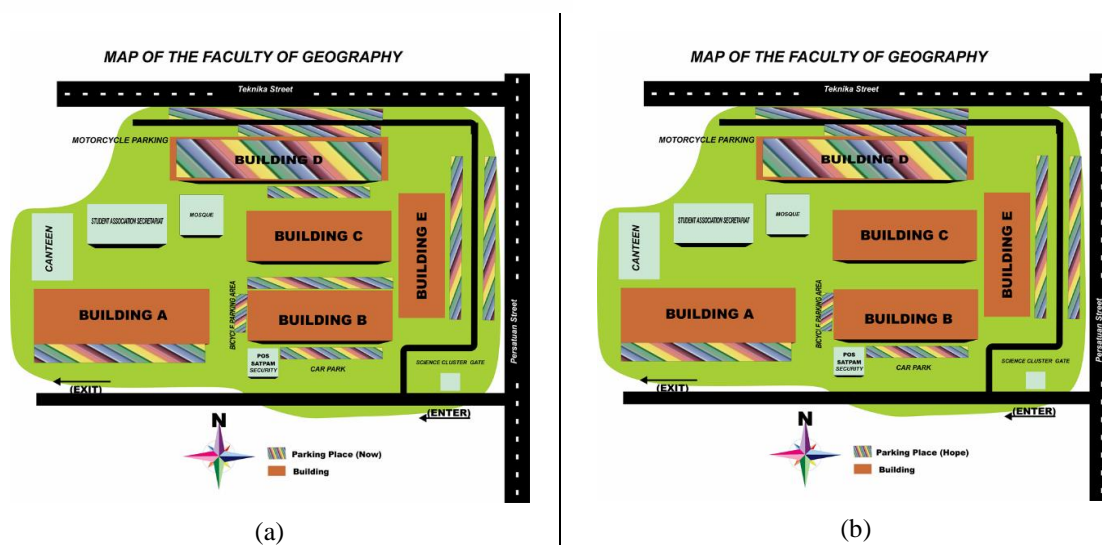


Figure 3. The designs of the parking space in Faculty of Geography at the time of research (a) and based on users' expectations (b).

Figure 3 shows the difference between the current parking space design and the desired layout by the users and the manager. At the time of research, nearly all of the empty spaces in the faculty was used as a parking lot (figure 3a). The expected locations of the parking lots by the users (figure 3b) did not show significant differences. Users' expectations mostly included the reparation/improvement of

the facilities, services, and systems. Based on the results of the interviews with users and the provider of the parking facilities, some expectations were described, for instance:

1. According to the plan, Building D was used as a parking lot. However, because of the current circumstances, the space on the north of this building remained unoccupied and was often used for parking motorcycles. Users expected this situation to continue in the future.
2. Users demanded regularity and clarity about the allotted space for parking motorcycles, namely the basement and on the east side of Building E. However, Building E required some improvements or a plan to arrange the parking motorcycles neatly. Meanwhile, cars were preferably parked between Buildings B and C, on the south and east sides of Building B, and in front of Building A.
3. The university's plan to develop parking lots outside the faculties and provide special vehicles like bicycles to connect the lots to the faculties was appreciated.
4. Instead of a parking lot, users would like to have open space on the south of Building D.
5. The ticketing system for vehicle entrance was still performed per cluster by the policy of the university. The entrance gate of the faculties in science cluster was planned to relocate from Faculty of Geography to Faculty of Biology in the following year.
6. The floor plan for other infrastructures had been already developed, including the addition and improvement of parking signs and facilities like CCTV. Users also demanded more lighting because the students often stayed late in the faculty and accessed the parking lots at night.

4. Conclusion

This research concluded that:

1. The average user satisfaction level with the parking facility in the Faculty of Geography was good. This level was obtained from the calculation of the users' assessment on every element of the parking services in the faculty; and
2. The results showed that each element was perceived as good by the users, indicating a good facility as a whole. If an element is good, a further development likely emphasizes on making it better. However, four element received poor rating due to the following factors: the unclear identity of the employees, minimum parking signs, bad drainage, ineffective ticket system, and the absence of CCTV installations.

5. Acknowledgment

This research was part of the Laboratory of Population and Economic Resource, Faculty of Geography UGM. Taking place in the Faculty of Geography, this research was expected to contribute to the decision making and the development of the faculty. This research was funded by BPPTN-BH in 2017 and conducted for eight months. The 2014 students of the Department of Geography and Environmental Science participated in data collection through interviews with approximately 300 respondents.

6. References

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