Travel time efficiency for students to school in bandung regency

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Abstract School selection is currently one of the considerations for parents and students in the use of time. Moreover, the determination of the current school associated with the zoning system organized both from elementary to high school that allows school to consider 80% of students who come from the nearby location. Essentially in determining the school is able to streamline, time and mileage for students, but the factors in efficiency was influenced by many things and was out of school by location determination. The purpose of this study was to determine the existence of SMP current location to the efficiency of travel time to get to school students. The research was conducted in Bandung regency, West Java Province. The population consists of the population in this region is the school and the student population. Samples region, using random sampling and selected 31 schools. As for determining the sample of respondents using stratified sampling technique with this type of sampling dispropositional. The method used is descriptive quantitative. Collecting data using a questionaire. The results showed that the overall time taken students can said to be efficient because the data shows that the travel time spent by students to go to school fairly evenly.

1. Introduction

Education is the most important part in the life of the nation, education is one of the most important factors in the development of human resources [1]. With education, people can develop and improve their quality. Republic Act No. 20 Year 2003 on National Education System is the legal basis and the implementation of the national education system reform. The law contains the vision, mission, functions and goals, as well as national education development strategy to achieve quality education, relevant to the needs of society and competitiveness in the global life. In the implementation of the national education goals still faces a variety of problem, one of them is about education equity.

Government efforts to equalize education is to create a policy in the acceptance of new students or admission of students. Where to in 2017 the government began to implement the zoning system at each level of education. The system is organized in Permendikbud No. 17 of 2017 on Admission of New Students of Kindergarten, Elementary, Junior High School, High School, Vocational High School. Schools organized by the local government must accept prospective students who are living in a radius of the zone nearest the school at least 90% of the total overall number of students who received [2].

Transportation facility can influence individual's need and opportunities. Since distance influences the travel-to-school mode choice, students can switch from short distances like cycling to modes appropriate for longer distances like public transport [3, 4]. Theory and evidence suggest that parents and students seek benefits by opting out of the nearest school Opting a far away schools, is associated with costs in terms of
money, time, opportunities, and potentially traveling to unsafe areas. Commuting time have an effect not only over the learning process, but also over the student welfare. The time the student spend could be alternatively used for studying or for recreational activities [5, 6].

Bandung Regency is one area that has begun to apply the zoning system in 2017. Students admission using three selection, including zoning lines with a percentage of 80%, academic, as well as track performance and affirmations 10% respectively [7]. In those guidelines also explained that in general for the school in Bandung Regency has followed the zoning system this is because schools have been named in accordance with their respective sub-district area.

Students or parents commonly choose the school that is nearest to their homes. So that the time taken to get to school is more efficient. In addition, an above-average intelligence who owned students will be spread in all schools, so that competition between schools will be impartial. Therefore, to determine the application of the Students Admission policy is efficient or not in terms of travel time, this research aim to analyze the efficiency of travel time that can be achieved by students based on school location.

2. Research methods
The method used in this research is descriptive method with quantitative approach. The research was conducted in Bandung Regency, West Java Province. For determining the sample of respondents, researcher using stratified sampling technique and using a questionnaire to collecting. Sample of respondents in this study were 400 students, scattered in Junior High School in Bandung. 31 schools have become places of sampling, and thus 13 students were selected from each school. Considerations in determining the effectiveness and efficiency of the sample is, the more schools are involved it will be increasingly representing the population, but instead increasingly inefficient, especially in terms of time, effort and cost.

3. Results and Discussion
3.1. Traveling time
The travel time required to get to junior high school is very diverse because it deals with the distance factor and keberaadaan transport used. Below is a table using the travel time to get to school purposes.

| No. | Traveling time | F   | %    | Category     |
|-----|----------------|-----|------|--------------|
| 1.  | 1-10 minutes   | 150 | 37.5 | Highly Efficient |
| 2.  | 11-15 minutes  | 105 | 26.3 | Efficient    |
| 3.  | 16-20 minutes  | 52  | 13.0 | Efficient enough |
| 4.  | 21-30 minutes  | 58  | 14.5 | Not efficient |
| 5.  | > 30 minutes   | 35  | 8.8  | Extremely Inefficient |
| Total|                | 400 | 100  |              |

The results showed that travel time required students to go to school is quite uneven, less than half (37.5%) of students taking the fastest time is between 1-10 minutes. It is included into the category very efficient. However, a small proportion (8.8%) of students taking the longest time that is longer than 30 minutes and it is very inefficient, because students take longer than 30 minutes to get to school. This will make students feel fatigue.

From these data it can be seen that the time taken by students to get to school as a whole relative in accordance with the standards set which states that the travel time ideal is less than 20 minutes and in general can also be categorized as efficient in terms of time [8].

Students duration time to reaching school not only affected by the distance but also by the type of vehicle they use. It will be more efficient if the school located near student house.
Each school has its own rules, including school hours. There are some schools who entered school in the morning hours starting from grade 7 to grade 9. But some schools are divided into two parts, in the morning and afternoon. This is because the capacity of the school is not possible if one time only. Here is a departure time table for school students.

| No. | Departure to School | F  | %  | Back to Home | F  | %  |
|-----|---------------------|----|----|-------------|----|----|
| 1.  | 5:00 to 5:30 a.m.   | 5  | 0.7| 5:30 to 6:00 a.m. | 4  | 0.6|
| 2.  | 5:31 to 06:00       | 61 | 8.7| 6:01 to 06:30    | 116| 16.5|
| 3.  | 6:01 to 06:30       | 204| 29.0| 6:31 a.m. to 07:00 | 142| 20.2|
| 4.  | 6:31 a.m. to 07:00  | 71 | 10.1| 07:01 to 07:30   | 79 | 11.2|
| 5.  | 10:00 to 10:30 a.m. | 16 | 2.3| 10:01 to 10:30 a.m. | 2  | 0.3|
| 6.  | 10:31 to 11:00      | 23 | 3.3| 10:31 to 11:00   | 16 | 2.3|
| 7.  | 11:01 to 11:30      | 12 | 1.7| 11:01 to 11:30   | 22 | 3.1|
| 8.  | 11:31 to 12:00      | 6  | 0.9| 11:31 to 12:00   | 14 | 2.0|
| 9.  | 12:01 to 12:30      | 2  | 0.3| 12:01 to 13:30   | 5  | 0.7|
| Total|                     | 400| 100| Total          | 400| 100|

Less than half (29%) of students leave school between the of 6:01 to 06:30 pm and 20% students reached the school at 06:31 to 07:00 am. As for the afternoon school has a small portion (3.3%), the participants set off between the 10:31 to 11:00 am. From these data it can be seen that the variation between different departure time. This can happen because the rules made by the school. The variation in distance from the residence to school will affect the travel time, so the students should be able to set the time of departure. Besides, the availability of transport can also influence the departure time. Transport equipment that used are quite diverse, both private vehicles such as motorcycles, cars, and bicycles, as well as public transportation such motorcycle, wagon, and so forth.

3.2. Accessibility Go to School Students
Accessibility is closely related to the selection of a location of the school, as it relates to factors and types of roads, road conditions, process or access to school, availability of transportation mode and distance, as well as the type of vehicles used by students to get to school.

3.3. The type and type of the road traversed by Students heading to School
In each District in Bandung own system of road network in terms of road dimensions and function is the primary arterial roads and collector primer. Meanwhile, the countryside has awakened every village road that connects the village with the village.

| No. | Type and Type Path                     | F  | %  |
|-----|----------------------------------------|----|----|
| 1.  | Footpath                               | 30 | 4.3|
| 2.  | District roads - Jalan State / Province | 2  | 0.3|
| 3.  | Village Road - Road Subdistrict        | 19 | 2.7|
| 4.  | Village Road - Street City / Province  | 2  | 0.3|
| 5.  | Village Road                           | 44 | 6.3|
| 6.  | district roads                         | 17 | 2.4|
| 7.  | Paths - Village Road - Road Subdistrict| 44 | 6.3|
| 8.  | Jalan Setapak and Jalan Desa           | 219| 31.2|
| 9.  | Trail and Road Subdistrict             | 13 | 1.8|
Based on Table 3. The type and the road traversed by students are extremely diverse. It is noticeable that 31.2% of students pass through the mesh walkways and rural roads to get to school. A small portion (6.3%) of students through the trail-sub-sub-district and village road just past it. While a small portion (4.3%) also just passed the footpath. Meanwhile students who pass through the village road districts and sub-districts roads only a small proportion (2.7%) and (2.4%). In addition, a small portion (1.8%) and (1.1%) of students through the trail-districts and 4 types of roads which pass through the trail-sub-sub-State / Province. 0.3% of the total respondents, passing through sub-State / Province

3.4. Road condition
Condition of roads in Bandung Regency is quite good, especially on the main roads, it is enough support for citizens to travel, especially when the students go to school. Average road traversed by the children to Junior High School (SMP Negeri) path was quite good.

Table 4. Conditions Road to School

| No. | Road condition | Frequency (F) | Percentage (%) |
|-----|----------------|---------------|----------------|
| 1.  | Very good      | 36            | 9.0            |
| 2.  | Well           | 260           | 65.0           |
| 3.  | Not good       | 98            | 24.5           |
| 4.  | Badly damaged  | 6             | 1.5            |
| Total |                | 400           | 100            |

Most (65%) respondents state that road conditions to the school are in good condition. The road traversed by junior high school children are already quite good because of the road most of the walkways, the village and sub-district which is paved or in the cast. Although the path of no uneven or perforated but overall is good.

3.5. Students Toward Access to School

Table 5. Students Toward Access to School

| No. | Access    | Frequency (F) | Percentage (%) |
|-----|-----------|---------------|----------------|
| 1.  | Very easy | 66            | 16.5           |
| 2.  | Easy      | 304           | 76.0           |
| 3.  | Difficult | 30            | 7.5            |
| 4.  | Very difficult | 0       | 0              |
| Total |          | 400           | 100            |

Based on Table 5, the access of students to school can be said to be easy. This is evident from the answers of respondents, the majority (76%) of respondents answered easily, while a small part (7.5%) respondents difficult.

3.6. Distance Towards School
Distance to school depends on where the students lived. The implementation of the policy by using zoning, is now easier for students who lived close to the school, to choose the school. After analysis, the distance from their homes to school are extremely diverse. The following are the results of the analysis.
1. > 1 Km 194 48.5
2. 1.1 to 5 Km 170 42.5
3. 5.1 to 10 Km 31 7.8
4. 10.5 to 15 Km 3 0.8
5. > 15 Km 2 0.5
**Total** 400 100.0

The results showed that less than half (48%) of students has a distance of less than 1 km to school. While less than the other half (42%) has a distance of between 1.1 - 5 km to go to school. While the other 7.8% between 5.1 to 10 km. 0.8% other students considerable distances namely from 10.5 to 15 km to go to school, as well as a small portion (0.5%) of the total students to travel more than 15 km to go to school. From the above data it can be seen that the distance from the residence of students heading to school as a whole is relatively accordance with the standards which states that the ideal distance is 1.5 km junior locations for minimum standards, and 6 km for maximum distance [8].

3.7. transportation
Transportation support everyday human activity, particularly in mobilityIn Bandung itself has a wide range type of transport to travel. Student have many choices in choosing a good transportation using private or public transportation. The following can be known about the ease of getting transportation to get to school.

| No. | Category  | Frequency (F) | Percentage (%) |
|-----|-----------|---------------|----------------|
| 1.  | Very easy | 63            | 16             |
| 2.  | Easy      | 267           | 67             |
| 3.  | Difficult | 66            | 17             |
| 4.  | Very difficult | 4  | 1.0          |
| **Total** | 400 | 100          |

Based on Table 7, it can be seen that more than half (67%) of respondents said that available modes of transportation to get to school could easily be. 17% of the respondents said that the availability of modes of transport difficult to obtain, this is due to lack of or limited mode of transportation to get to school. While 16% respondents mention easier and 1% of respondents of other states is very difficult.

Available modes of transportation to get to school can be categorized easily earned by residents. However, if people use means of transportation to school or not, here is the explanation.

| No. | Category  | F   | %   | Information |
|-----|-----------|-----|-----|-------------|
| 1.  | Yes       | 228 | 57.0| 92 respondents (40%) ushered parents |
| 2.  | Not       |     |     | 136 respondents (60%) do not transfer the elderly |
|     | 1-10 minutes | 55 | 13.8| |
|     | 11-20 minutes | 52 | 13  | |
|     | 21-30 minutes | 29 | 7.3 | |
|     | > 30 minutes | 36 | 9.0 | |
| **Total** | 400 | 100 |   | 

The results showed 57% of students using transportation to get to school, and 60% of students are not escorted by parents, but they use it themselves. 43% of students do not use the means of transportation to get to school, it indicates that the students walk to school. The time it takes students to walk to school is quite varied, ranging from 1-10 minutes to over 30 minutes. 13.8% and 13% of students walking between 1
-10 minutes and 11-20 minutes. Beside that, 9% of students walked more than 30 minutes, and 7.3% of students walk between 21-30 minutes. Kind of mode of transport used by students is very diverse, ranging from privately owned vehicles or public transportation. The following are the types of transportation used students when heading or go to school.

| No. | Transport type                                      | Go (%) | Return (%) |
|-----|-----------------------------------------------------|--------|------------|
| 1   | Bike                                                | 8      | 2          |
| 2   | Personal Motor and Transport                        | 17     | 4.3        |
| 3   | Motorcycle taxi and Public Transport                | 5      | 1.3        |
| 4   | Motorcycles, Public Transport and Railways          | 1      | 0.3        |
| 5   | Public transport and Delman                         | 2      | 0.5        |
| 6   | Personal Motor                                     | 116    | 29         |
| 7   | Taxibike                                            | 23     | 5.8        |
| 8   | Private car                                         | 2      | 0.5        |
| 9   | Public transport / freight village                  | 61     | 15         |
| 10  | Delman                                              | 7      | 1.8        |
| 11  | Transport Online                                    | 4      | 1          |
| 12  | No (Walking)                                        | 154    | 39         |
| 13  | Truck                                               | 0      | 0          |

Total: 400 100 400 100

Table 9. Transport use type of Students When Go and Home from School

The results of the above study, data showed that 39% of students do not use any means of transportation to go to school. This indicates that students go to school on foot. While 29% students use private vehicle. Public transport / transit village used by a minority (15%) of students, motorcycles (5.8%) and other small 4.3% of students using a private motor as well as public transport as a means of transportation to go to school.

From the above data it can be seen that there are differences in the percentage of means of transportation used when going to and from school. 42% of students do not use any means of transportation when coming home from school. An increase of 3%, it indicates that there is students who at the time went by car, but when the return of learner’s walks. 23% of students return using public transportation, meanwhile 19% of students use private bike

The following are the results of analysis of the percentage of use of means of transportation by students who can be seen in the table below.

Table 10. Transportation Equipment Usage by Students

| No. | Category               | Frequency (F) | Percentage (%) |
|-----|------------------------|---------------|----------------|
| 1   | No (walking)           | 154           | 39             |
| 2   | Go to school           | 45            | 11             |
| 3   | Home from school       | 13            | 3.3            |
| 4   | Go and Home from School| 188           | 47             |

Total: 400 100

Table 10 showed that 47% of students using transportation as much as 2 times that at the time of going to and from school. While 39% of students do not use vehicle.

The results showed that Bandung regency have so many public transportation and it is enough to facilitate citizens mobility. Besides, most of the residents own vehicles such as motorcycles or cars, making it easier for people to do the activity. However, less than half of students using transportation twice a day,
this is considered burdensome because students can create fatigue, stress and decrease the motivation of students being too tired on the way to school.

![Figure 1. Map of Efficiency Time, Distance and Transportation Cost Junior High School in Bandung](image)

The results of the overall study travel time taken by students efficiently because the data shows that the travel time spent by students to go to school fairly evenly. Most (76.7%) of students taking the fastest time is between 1-20 minutes. From these data it can be seen that the time taken by students to get to school as a whole relative in accordance with the standards which states that the travel time ideal is less than 20 minutes and in general can also be categorized as efficient in terms of time [8]. Proximity between a residence with schools to make children take a short time to go to school. With close proximity, students can walk to school. However, there is still inefficient fraction (23.3%) of students take the longest time is between 21-30 minutes and over 30 minutes. It is inefficient, because students take longer than 20 minutes to get to school. In contrast to the results of other research that stated maximum travel time from home to school in a single trip takes 90 minutes for elementary and middle school students, and 60 minutes for middle school students [9]. Long journey times to indicate the distance would be far outweighed by the time required.

A short distance away from the residence to school will take a long time to get to schools that have an impact on students feel fatigue, loss of motivation to learn. The location of the school has a considerable influence on the student home management. Urban middle school student, compared with rural counterparts, reported being more self-motivated during homework [10].

There are variations in travel time that is passed by students, due to the location of residence of different students, so that the distance and the time taken by students were different. In addition, the means of
transport used every student is different, so it affects the time it takes to school. The closer the distance, the faster the time taken by students and this will be more efficient.

Overall distance, time, and costs incurred by the parents can be said to be efficient. However, schools in some areas in Bandung there are not efficient in terms of distance, time and cost. The region, among others Ciwidey, Pasir Jambu, Cicalengka, Bojongsoang, Arjasari, Pangalengan, Paseh, Rancaekek, and Majalaya. This happens because of the uneven distribution of the population, so that the area school outreach is becoming more widespread and causes considerable distance between the residence to the school. To reach the school children take a long time and cost a bit.

4. Conclusion
The results of the overall study travel time taken by students efficiently because the data shows that the travel time needed by students to go to school fairly evenly. Most students fastest travel time is between 1-20 minutes. However, there are still a small fraction efficient learner take the longest time is between 21-30 minutes and no more than 30 minutes.

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