Journal of Innovation in Educational and Cultural Research

Volume 3 Issue 4 Year 2022 Pages 651-658
ISSN 2722-9688 | e-ISSN 2722-9696
http://jiecr.org | DOI: 10.46843/jiecr.v3i4.3

Learning Multimodal Transportation Before and After Covid-19 Pandemic

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Abstract: This study aims to look at the trend of Light Rail Transit (LRT) mass transportation during the covid-19 pandemic as a lesson for multimodal transportation courses. The type of qualitative research that becomes a research instrument is the researcher himself (the author) who is directly involved in the research. The determination of informants in this study uses purposive techniques where only certain people or parties will be used as research objectives as a source of information, namely Informant I: Head of the Section on the Utilization of Facilities and Infrastructure, Informant II: Officials making committees of public service agencies, Informant III: Managers of Passenger Numbers and Revenues, Informant IV: Train Travel Organizers. The results of the study are expected to be able to measure the level of understanding of cadets in the Multiomoda Transportation course. Through the pre-test as the average basis for cadets' knowledge of the Multimodal Transportation course of 87.00, then an intervention was carried out through education and material training based on the results of a research study of light rail transit (LRT) mass transportation trends before and after the Covid-19 Pandemic and a reassessment was carried out to obtain the average post-test results and the results changed to 91.86. Through the Paired Sample T-Test test, the significance value of the pre-test and post-test can be tested, a significance value of 0.000 is obtained, which means that there is a significant difference between the pre-test and post-test values. Furthermore, it can be seen the Correlation value of 0.525 which shows the strength of the relationship of the 2 variables tested, namely pre-test and post-test.

Keywords: mass transportation; light rail (LRT); covid-19; multimodal transport

Recommended citation: Komalasari, Y., Masito, F., Kristawan, M., Danim, S., Hamzah, S., & Hadiwinarto. (2022). Learning Multimodal Transportation Before and After Covid-19 Pandemic. *Journal of Innovation in Educational and Cultural Research*, *3*(4), 651-658.

INTRODUCTION

Transportation is the lifeblood of world economic growth. A developed country is shown how good its transportation system is. Indonesia is a developing country, one of which is marked by the development of its national transportation system. Judging from the current road transportation sector, steps are needed to unravel congestion on the road, one of which is through the diversion of the use of private vehicles to public transportation. Multimodal Transportation is one of the compulsory courses in semester V (five) of the Mainland Aquatic Transportation Management (MTPD) study program at the official school under the Transportation Human Resources Development Agency (BPSDM) of the Ministry of Transportation, where one of the materials is the development of the national transportation system. The National transportation system was formed from Multimodal Transportation of goods transportation and Intermodal Transportation, namely the transportation of passengers. The national transportation system is formed from various factors that influence each other. According to KM. 59 of 2005, The realization of an effective and efficient national transportation system faces various challenges, opportunities and constraints in connection with dynamic environmental changes such as regional autonomy, economic globalization, changes in the behavior of demand for transportation services, political conditions, developments in science and technology, concern for environmental sustainability and limited resources. The emergence of the Covid-19 pandemic in almost all parts of the world, of course, also has an impact on the Indonesian state. The transportation sector is one of the biggest affected. There are large-scale social restrictions (PSBB) where the number of transportation service users is limited in accordance with the health protocol rules implemented by the government to reduce the spread of the COVID-19 virus in Indonesia. Changes in the behavior of demand for transportation services certainly affect the decline in the effectiveness of the national transportation system.

Indonesia as a developing country is currently heading to the stage of a developed country, this makes Indonesia carry out development in all fields in order to achieve the welfare of a just and prosperous society. Urban development is one of the aspects that is currently experiencing rapid progress followed by an increase in the number of people, the rapid development of cities in Indonesia which has resulted in the emergence of many problems, one of which is the transportation problem which is an urgency in urban development (Aprilisa,

2019). Congestion is a special feature for developing urban areas. Rail-based public transportation tends to be congestion-free, produce less pollution, and can carry a considerable number of passengers. The phenomenon of rail-based public transportation is one of the choices to overcome congestion problems in the people of Palembang city (Putra & Heryanti, 2020). Transportation problems that exist in urban areas include inadequate facilities and infrastructure, low public awareness of the use of traffic facilities and road equipment, congestion and the implementation of traffic demand management that has not been effective and efficient in controlling traffic movements (Kurniawan et al., 2021). The problem that is often faced today is how to manage transportation by realizing transportation services that are safe, comfortable, and also affordable for the community, and adequate for all their needs (Churniawan et al., 2019). One indicator that this public transport facility can be considered good is knowing the accessibility value of the facility. If public transportation facilities have good accessibility value, then interest in transportation facilities will also increase, so road users will switch to using public transportation vehicles (Riawan & Ahyudanari, 2020).

In a previous study of Bakhtiar (2018) where the level of municipal transport performance did not match the requirements seen from several indicators. So it is appropriate for the government to take steps or policies in overcoming the problems that exist on this path. Nirwan and Wahju (2012) stated that rail-based mass transportation tends to be free of congestion, produce less pollution, and can carry a considerable number of passengers. In addition, the process requires little land acquisition compared to land acquisition for the construction of new roads. Putra and Heryanti (2020) stated that the large number of public transport fleets with roadworthy conditions can cause traffic jams and accidents. The problem in this study is that the high mobility of vehicles in the city causes many problems for road users, traffic at certain hours, density of mode use from 08.00 to 17.00 WIB (working hours), so that the activities of the city community will form movement patterns related to social mobility. The large level of community movement must be supported by adequate transportation facilities and infrastructure to anticipate various transportation developments in the people of Palembang. Transportation is a derivative demand due to economic, social, cultural activities and so on. Along with the growth of an area or city, both in terms of economy and in terms of population, it will have an impact on increasing the use of transportation services, including the use of public transportation services for its movement. Within the macroeconomic framework, transportation is the backbone of the economy at the national, regional and local levels, both for urban and rural areas (Edy et al., 2019).

Light Rail Transit (LRT) is a mode of mass transportation of light rail that is expected to divert personal use to mass transportation users to reduce congestion, especially in the city of Palembang (Anisah et al., 2020). Light Rail Transit (LRT), or railways can make efficient use of road space and reduce the use of private vehicles, which will have an impact on the efficiency of fuel oil use, reduce air pollution, and reduce the incidence of traffic accidents (Riawan & Ahyudanari, 2020). The existence of LRT (Light Rail Transit) in the city of Palembang as mass transportation is a manifestation of the concept of multimodal transportation in accordance with Government Regulation Number 8 of 2011, namely the transportation of goods using at least 2 (two) different modes of transportation based on 1 (one) contract as a transportation document. multimodal transportation from one place where the goods are received by the multimodal transportation business entity to the place intended for the delivery of goods to the recipient of multimodal transport goods. Currently, LRT (Light Rail Transit) in the city of Palembang has begun to synergize with other transportation such as bus companions, Damri, and other transportation in the city which makes the trip more comfortable without being disturbed to get to the destination. This concept can certainly be the right lesson in the application of the multimodal transportation system course. Intermodal/intermodal transfers are the key to successful urban transport, ease of coverage/accessibility to and from LRT stations must have a clear scheme (Sianipar, 2019).

Palembang City LRT (Light Rail Transit) was inaugurated by the President of the Republic of Indonesia on July 15, 2018 as the first LRT system built and operated in Indonesia. It is hoped that the Palembang LRT can be an initiator in providing a rail-based urban mass transit system for other cities in Indonesia. The city of Palembang, which has a population of more than 1.8 million people (in 2018), has been clarified as a Metropolitan City. Therefore, the development of mass transport must be realized. In accordance with the definition in Law 26 of 2007 concerning spatial planning, the Greater Palembang metropolitan area has met the requirements for clarification of a metropolitan area, namely the existence of functional relationships and an integrated regional infrastructure network system with a minimum population of 1,000,000 people (one million) people (Komalasari, 2022).

Ideally, a metropolitan city as big as Palembang has a mass transportation system (either road-based or rail-based) which is the backbone of urban passenger transportation services. Therefore, the development of a mass transportation system is quite urgent to be realized in the city of Palembang. Currently, the LRT (Light Rail Transit) transportation system in Palembang City has been served by 8 Trans Musi corridors, 7 conventional bus routes, 5 public transportation routes and 5 taxi companies. However, the role of road-based modes of public transport has not been able to overcome the increasingly even congestion in the city in recent years. This prompted the emergence of a proposal to develop a light rail-based mass transportation system (monorail/LRT)

in the city of Palembang.

However, around 2019 the world experienced a crisis due to the COVID-19 pandemic. Covid-19 has hit all sectors, including the transport sector. Coronavirus disease 2019 (COVID-19) was detected in December 2019 in the city of Wuhan, located in Hubei province, People's Republic of China (Birtus & Lazaroiu, 2021; Irfan et al., 2021; Mitchell, 2021; Ahmad et al., 2022). Rail transport suspended their operations and the train station provided a quiet, massless look after the spread of COVID-19. Strict lockdowns imposed by government officials due to the spread of COVID-19 (Hao et al., 2021). According to Dineros & Dipasupil in Kennedy et al. (2020), lockdown is an urgent protocol that is usually used to restrain people from leaving a place or area. The lockdown is intended to prevent the spread of the Covid-19 virus (Yunus & Rezki, 2020). During the lockdown, community activities were very limited and had to keep their distance, there were no face-to-face school activities, work from home instead of in the office, activities at tourist attractions were closed and shopping malls or malls were also closed. This leads to a decrease in the movement of transport activities. Indonesia does not know lockdown, but is more familiar with the term regional quarantine based on Law No. 6/2018 concerning Health Quarantine. According to Government Regulation Number 21/2020, regional quarantine is a restriction on the number of residents in an area. What is being done in Indonesia is physical distancing or some experts say semi-lockdown, or partial lockdown, or softened lockdown.

Covid-19 in Indonesia has brought many changes in the economic, social, political and transportation systems. One of them is the restriction of activities carried out by the government to stop the spread of the Covid-19 virus (Widyarini et al., 2022). The transportation of passengers, goods and logistics, to rent or charter has a significant direct impact. The spread of the COVID-19 outbreak is influenced by the level of mobility of urban people, both inner-city and out-of-town mobility (Ghiffari, 2020). Like the impact of COVID-19 on transportation in the Jabodetabek area, namely all modes of transportation in Jabodetabek experienced a significant decrease in passengers (Luthfiyah & Miro, 2020). This also applies to public transportation in South Sumatra. The economic and social impact of the covid-19 outbreak on public transport goes beyond service performance and health risks to financial viability, social equality and sustainable mobility where there is a risk that if the public transport sector is perceived as a poor transition to a post-pandemic state, the idea of transporting From the foregoing, researchers conducted a study on Mass Transportation Trends During the Covid-19 Pandemic Light Rail Transit (LRT) Transport Case Study South Sumatra as a Study of Multimodal Transportation course. The purpose of this study is to include the latest research results of multimodal transportation into the teaching material and see the learning outcomes before and after intervention through education and training by including research results in the teaching material through pre-test and post-test.

METHODS

This research is a type of qualitative research stated by Bogdan and Taylor (1993) as a research procedure that produces descriptive data in the form of written or spoken words from humans and observable behaviors. Researchers use several data collection techniques, namely observation, interviews and documentation. This research took place at the Ministry of Transportation of the Republic of Indonesia, especially at the South Sumatra Light Rail Management Center as a light rail operator and PT Kereta Api Indonesia (Persero) as a light rail operation. In this study, the research instrument is the researcher himself (the author) who is directly involved in the research. Researchers as the main instrument are researchers who plan, collect, and interpret data. The determination of informants in this study uses purposive techniques, where only certain people or parties will be used as the researcher's goal as a source of information. According to Sugiyono, qualitative research is not known for the concept of population and samples. Sources of information for qualitative research are informants or resource persons related to research problems and by researchers are considered capable of providing information and data (Sugiyono, 2007). There are 4 (four) informant in this study including informant I: Head of Section utilization of Facilities and Infrastructure, informant II: Official Making Committee of the Public Service Agency, informant III: Manager of Passenger Numbers and Revenue and informant IV: Railway Travel Regulator.

RESULT AND DISCUSSION

The results of the interview coverage of public service standards include 6 (six) aspects, including service procedures, completion times, service costs, service products, facilities and infrastructure and the competence of service delivery officers. The following are the results of questions related to the scope of public service standards to 4 (four) informants / resource persons that have been determined, including in the service procedures there is already a legal basis that is the current reference, including the Regulation of the Minister of Transportation Number 69 of 2019 concerning Minimum Service Standards for Transportation of People by Train, SOPs in accordance with the Regulation of the Head of Palembang Regional Division III Number SOP. EVP.DV.III/KL.104 /II/3 /DV.3-2021 issued on February 26, 2021 as well as the SOP which is being reviewed

by the South Sumatra Light Rail Management Center. The current complaint resolution time is 98% of complaints completed 2% in the settlement process but there is no complaint hotline at this time, so only an IKM survey is carried out. The current service fee is in accordance with the Regulation of the Minister of Transportation Number 22 of 2020 concerning LRT tariffs and the determination of tariff details is contained in the Regulation of the Minister of Transportation Number 197 of 2015 for the pioneer tariff component that has been running for 4 years.

The service product is currently carried out only for passengers and goods with dimensions of 100x40x30 cm with a maximum weight of 20 kg, with operating times starting from 06.54-19.54 with a total of 88 trips per day, headway 17-19 minutes and travel time of 47 minutes to DJKA and 49 minutes to the airport. The facilities and infrastructure are adequate and have been integrated with other modes of transportation and are friendly to vulnerable groups (people with disabilities, the elderly, pregnant women, and toddlers). The competence of service delivery officers is provided by PT. KAI. through Service Level Agreement (SLA), have certification and application of service ethics by providing penalties and rewards.

Multimodal Transportation is one of the compulsory courses in semester V (five) of the Mainland Water Transportation Management (MTPD) study program. As a candidate for a transportation officer who is competent and professional in their field, prospective cadets need to carry out the education process properly during lectures. In the multimodal transportation course, it is explained that the development of the national transportation system is influenced by various factors, both internal and external. The results of the research on the trend of Light Rail Transit (LRT) mass transportation in the city of Palembang were included in the learning element to update the needs of students for transportation development. Learning was carried out to the Cadets in semester V (five) of the Mainland Water Transportation Management study program as many as 47 (forty-seven) people, 2 (two) classes. Learning results are seen in the pre-test scores before research and intervention in the course and post-test results after analysis of research and intervention data in the course.

The type of research used in processing cadet learning outcomes data is a quantitative type with a cross-sectional research design. This study aims to see the average difference in the pre-test and post-test values so that a paired sample t-test analysis test is carried out (Komalasari & Utama, 2022). The population of this study is the Cadets of Diploma III in Land Water Transportation Management (MTPD) which amounts to 47 (forty-seven) people. To obtain optimal results, minimal sample calculations are carried out according to the method of mathematical analytical research in pairs (Dahlan, 2010). Using examples from the research of Tobase et al. (2017), the error value considered meaningful is 8.4. Because there is no data on the standard deviation of the average difference, it is used that the standard deviation is twice out of 11 minimum average differences which is considered meaningful. However, in this study, no minimum sample is needed, because the study will use total sampling. The inclusion criteria of this study are all Diploma III in Mainland Aquatic Transportation Management (MTPD) which fill out an informed consent sheet, a complete examination questionnaire. Incomplete or unfilled data became the exclusion criteria of this study.

The data collection technique is to use participant observation from the exam questionnaire filled out by the research sample through a google form. The data analysis carried out in this study is univariate analysis and bivariate analysis. Univariate analysis was performed to see the average of the pre-test and post-test scores performed to cadets. While the bivariate test is carried out to test the significance of changes in knowledge in cadets. Analysis of mass transportation trends during the Covid-19 pandemic, the case study of LRT (Light Rail Transit) south Sumatra based on the Government Regulation of the Republic of Indonesia Number 8 of 2011 has been used as a study in the field of multimodal transportation. The results of the application of learning based on the learning outcomes of students. The following are the results of cadet learning achievements in the Multimodal Transportation course carried out before the research (pre-test) and after the research (post-test) can be seen in the following table:

Univariate Test (Data Frequency)

From the univariate test results, in the pre-test variable, an average value of 87.00 was obtained, a median value of 88.00, a standard deviation of 4.37 was obtained. As for the post-test variable, the average value was obtained at 91.86, the median value at 92.00, and the standard deviation value at 4.62.

	Mean	Median	SD	Minimum	Maximum
Pre-Test	87.00	88.00	4.37	80.00	98.00
Post-Test	91.86	92.00	4.62	82	100

Figure 1. Univariate Test (Data Frequency)

Data Normality Test

Variable	State	Itself.	Conclusion
Pre-Test	0.962	0.136	Normal distributed data
Post-Test	0.095	0.123	Normal distributed data

Figure 2. Data Normality Test

The normality test aims to test whether the data of dependent variables and independent variables have normally distributed data or not. Good data is to have a normal or close to normal data distribution. To test normality, it can be analyzed using the Shapiro Wilk Test method because the data is less than 100 samples. The basis for decision making is that if the t-statistical probability value > the level of significant = 0.05, then the regression model meets the assumption of normality. From the table above, it can be seen that the pre-test and post-test variables are normally distributed (sig > 0.05).

Uji Paired Sample T-Test

Variable	Mean	Herself	P-Value	Correlation	There
Knowledge of Multimodal Transportation Course					
Pre-Test	87.00	0.645	0,000	0.525	-6.174 s/d -3.564
Post-Test	91.86	0.682			

Figure 3. Uji Paired Sample T-Test

From the table above, a significance value of 0.000 is obtained, which means that there is a significant difference from *the pre-test and post-test* values. Furthermore, it can be seen the Correlation value of 0.525 which shows the strength of the relationship of the 2 variables tested, namely pre-test and post-test. This research was conducted to assess the level of Cadets of the D.III Land Water Management (MTPD) Study Program in the Multimodal Transportation course. The average *pre-test* result is 87.00. These results show the average of the cadet's basic knowledge of the Mulltimoda Transportation course. After the intervention of education and training courses based on the results of the research, a reassessment was carried out to obtain the average *post-test* results. The average *post-test* result changed to 91.86 There was a significant increase in the basic knowledge possessed by the Cadets after being given education and training on the material. Furthermore, the data were tested using a *paired sample t-test* analysis test with a *cross-sectional* research design to aim to see the average difference in *the pre-test* and *post-test* values that were previously carried out by the data normality test to ensure that the data was normally distributed, namely with the similarity in the amount between *pre-test and post-test data.* The success of the research can be seen from the significant increase in exam results through the average pre-test results and the average post-test results indicates that the discussion of lecture materials for educational and training interventions is based on the results of the latest research analysis periodically in order to maintain the understanding of cadets in the entire lecture material.

Transportation is an indispensable part of people's lives. The growth and development of a community requires the role of transportation services that support community business activities in general (Purwanti et al., 2018). The selection of modes can be said to be the most important stage in determining the policy of implementing transportation (Rusmandani et al., 2022). The advantages and disadvantages of public transportation can be obtained from the form and service system of transportation routes. The provision of quality transportation services to the community is one of the main tasks of the government so that there is a need for coordination in policy strategies, planning and implementation (Prasetyo, 2016). Giannopoulus (1989) says that the most ideal form and route is one that as much as possible has a shape that resembles a straight line with a round-trip service system. According to him, the route in the form of a loop, circle or "G" will give the impression of wasting time for passengers. This situation is very pronounced if passengers want to go to the area opposite the starting point, because passengers have to turn first before reaching their destination (Rita, 2018).

Light Rail Transit (LRT) South Sumatra is one of the rail-based public transportation that is expected to solve transportation problems in the city of Palembang (Widiyanti, 2019). The government through the issuance of the Minister of Transportation Regulation Number 119 of 2018 concerning the Organization and Work Procedures of the South Sumatra Light Rail Management Center has established a South Sumatra LRT Technical Implementation Unit which is broadly tasked with managing and improving the sustainability of South Sumatra LRT services. The concept of LRT (Light Rail Transit) transportation in the city of Palembang as mass transportation that is integrated with other inner-city transportation such as bus friends, Damri and other transportation is the government's effort to break congestion by diverting the use of private vehicles to mass transportation by improving the quality of service so as to increase interest for consumers. users of

transportation services. Based on the analysis and discussion in this study, students were able to identify and study the application of the urban transportation multimodal transportation system in multimodal transportation teaching materials obtained in educational institutions.

CONCLUSION

Based on the results of the research obtained, it was concluded that the test of research application on multimodal transportation teaching materials from a total of 47 (forty-seven) cadets was as follows. The respondents in this study were Cadets of the Diploma III Study Program in Mainland Water Transportation Management Research (MTPD) using a total of sampling, out of a total of 47 research samples. The average pre-test result was 87.00 as the average basis for Cadets' knowledge of multimodal transportation courses After intervention was carried out through education and material training based on the results of processed research data on the trend of mass light rail transit (LRT) transportation in the city of Palembang before and after the Covid-19 pandemic, a reassessment was carried out to obtain the average post-test results. The average post-test result changed to 91.86. There are indicators of success with a significant increase in the average value of the pre-test and post-test. Through the Paired Sample T-Test test, the significance value of the pre-test and post-test can be tested, a significance value of 0.000 is obtained, which means that there is a significant difference between the pre-test and post-test values. Furthermore, it can be seen the Correlation value of 0.525 which shows the strength of the relationship of the 2 variables tested, namely pre-test and post-test.

ACKNOWLEDGMENT

We would like to thank you:
1. Director of Palembang Aviation Polytechnic
2. South Sumatra Light Rail Management Center under the Directorate General of Railways
3. PT. Indonesian Railways (Persero) Drive III
4. Head of PPPM Center of Palembang Aviation Polytechnic
4. All students/cadets who have participated in this research.

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