CONGESTION DYNAMICS AND WORK ENVIRONMENT: A STRUCTURAL EQUATION MULTIGROUP ANALYSIS

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Abstract

This study aims to be able to analyze the factors that cause congestion in the Brawijaya University environment, an appropriate settlement model is needed so that it can produce solutions in the form of policies that can be applied to the Brawijaya University campus area to reduce congestion which will have an impact on the work environment. The analysis model used is SEM (Structural Equation Modeling) with Multigroup PLS (Partial Least Square) approach. The data used in this study consisted of Group 1 (Faculty of Administrative Sciences) and Group 2 (Faculty of Economics and Business), therefore this study used Multigroup SEM-PLS. The results showed that from the Multigroup SEM-PLS modeling it was shown that the best model was obtained in the Faculty of Economics and Business model (Group 2). This is proven based on modeling results which show a Q square value of 79.47%. The most dominant variable is Parking Facilities, where the strongest indicator in measuring Parking Facilities is the affordability of parking locations to work areas. Therefore, the indicator of the affordability of parking locations can be used as consideration for Universitas Brawijaya to be able to provide comfortable and strategic parking lots for campus residents. The originality of this study is the use of the Multigroup SEM-PLS model with driving behavior and congestion as a mediating variable between parking facilities and the impact of the work environment. where the strongest indicator in measuring Parking Facilities is the affordability of parking locations to work areas. Therefore, the indicator of the affordability of parking locations can be used as consideration for Universitas Brawijaya to be able to provide comfortable and strategic parking lots for campus residents. The originality of this study is the use of the Multigroup SEM-PLS model with driving behavior and congestion as a mediating variable between parking facilities and the impact of the work environment. where the strongest indicator in measuring Parking Facilities is the affordability of parking locations to work areas. Therefore, the indicator of the affordability of parking locations can be used as consideration for Universitas Brawijaya to be able to provide comfortable and strategic parking lots for campus residents. The originality of this study is the use of the Multigroup SEM-PLS model with driving behavior and congestion as a mediating variable between parking facilities and the impact of the work environment.

Keywords: Brawijaya University, Congestion, Impact on Work Environment, SEM-PLS Multigroup.

1. INTRODUCTION

The development of transportation today can have an impact on the environment and human life. The existence of transportation as a supporter of human movement will have positive implications for the increasing growth and development of a city. However, the development of transportation to date not only has positive implications but also negative implications, such as congestion, chaos, and traffic accidents.

Congestion which is commonly found in every urban area, especially in business locations, schools, or campuses, is one of the disturbances to modern life in large-scale cities, including Malang City. For most of us, getting stuck in traffic is a waste of time (Small et al., 2014). Several conditions can trigger and exacerbate congestion, namely population growth, increased number of vehicles, low road capacity, poor urban supervision and planning, and economic growth (Kesuma et al., 2019). According to data from the Central Bureau of Statistics for the City of Malang, population growth has increased 0.27 percent annually from the 2010-2020 period and there has been an increase in the number of vehicles.

Impact of congestion that occurs According to Ponrahon et al. (2019) the resulting traffic circulation can have indirect effects on the environment such as noise pollution which can cause noise during lectures/work environments when congestion occurs during rush hour, loss of natural environment and greenery, degradation of the visual environment by improper or illegal parking, air pollution from motorized vehicles moving or in idle mode due to congestion, energy consumption, land use regulation and health effects.

If you look closely, the source of the congestion that occurs on the streets of Malang City, especially Brawijaya University, is due to the mobility of the large number of academics living in the area around the campus. The mobility of the many academics of Brawijaya University does not only cause congestion around Universitas Brawijaya, congestion also occurs within the campus area of Universitas Brawijaya. In addition, the large number of vehicles entering the parking area of Universitas Brawijaya resulted in a queue around the entrance or exit of the parking area. Some of the causes of congestion in the campus area are the inadequate parking space available and the minimal driving behavior of UB residents (Kutty, et al., 2021).

The capacity of car parking in UB is 624 Parking Space Units (SRP), while the capacity of motorbikes is 5,312 SRP. The need for car parking space is 693 SRP, and the need for motorcycle parking space is 5,902 SRP (Wahyunita & Suharyanto, 2015). We can see this from the large number of vehicles parked on the right or left of the road which results in disruption of road function and driving behavior of UB residents in the campus area of Universitas Brawijaya, such as the road becomes narrow so that if there are two vehicles (cars) from each current passes through the same road simultaneously, the vehicle will run by reducing its speed or one of the vehicles stops first and runs alternately,

From these problems to be able to analyze the factors that cause congestion in Universitas Brawijaya, an appropriate settlement model is needed so that it can produce solutions in the form of policies that can be applied to the campus area of Universitas Brawijaya to reduce congestion. Thus, the subject of this study is more focused on lecturers and students as determinants of policy direction related to parking facilities and facilities at the Faculty of Administrative Sciences and the Faculty of Economics and Business, Universitas Brawijaya. Even though there are more students than lecturers and students, in this study students were used as external factors. This is because students are temporary and will follow stakeholder policies and cannot determine direction and further policy contributions. The novelty in this study is the use of the Multigroup SEM-PLS model with driving behavior and congestion variables as mediating variables between parking facilities and the impact of the work environment.

2. LITERATURE REVIEW

2.1. Parking Facilities

Parking is a stationary state of a vehicle that is not temporarily stopped with the driver not leaving the vehicle. Parking is a necessity for vehicle owners who wants their vehicles parked in a place where the place is easy to reach. Types of parking facilities are classified according to placement and divided into two parking arrangements, namely (Nourinejad et al., 2018):

1. On-street parking

Roadside parking takes place along the road with or without widening the road for parking barriers and visitors this type of parking is very detrimental if not managed properly and also locations with high intensity of land use are less profitable

2. Off-street parking

This parking method occupies a certain parking lot both in an open yard and in a special building and is planned based on applicable standards and does not use the road body. The parking position can be done like on-street parking, only the parking angle setting is affected by the area and shape of the parking lot. Off-street parking is expected to provide a better level of security from vandalism and theft.

2.2. Driving Behavior

Driving behavior that often violates traffic rules and carelessness in driving is included in aggressive driving behavior. Hong et al. (2014) state that driving behavior is said to be aggressive if it is done intentionally, tends to increase the risk of accidents, and is motivated by impatience, annoyance, hostility, and efforts to save time. Driving behavior indicators in this study were car and motorcycle drivers at Brawijaya University as measured by passing other vehicles, how to turn, how to park the vehicle, how to pass/overtake vehicles, and the response from traffic signs which results in increasing the risk to other road users and causing congestion. According to Sagberg (2015), there are three forms of aggressive driving behavior, namely impatience and inattention (impatience and inattention), for example, such as violating a red light and violating the speed limit. Next is a power struggle, for example, cutting lanes on purpose and threatening or insulting with words, gestures, as well as honking continuously. Finally, recklessness and road rage (carelessness and anger), such as driving while drunk and driving at very high speeds. Based on the three forms of aggressive behavior previously described, according to Sagberg (2015) this behavior is caused by 15 factors, namely immobility, restriction, regulation, lack of personal control, being put in danger,

2.3. Congestion

If the traffic flow approaches capacity, congestion starts to occur. Congestion increases when the current is so large that vehicles are very close to each other. Total congestion when the vehicle has to stop or move slowly (Tamin, 2000). Congestion is a condition in the road network that occurs along with an increase in usage, characterized by slower speeds, longer travel times, and increased queues of vehicles. The most common example is the physical use of the road by vehicles. When the traffic demand is large enough that the interaction between vehicles slows down the speed of the traffic flow, this results in some congestion. When demand approaches road capacity (or intersections along the way), extreme congestion occurs.

There are several important impacts or trends in urban transportation services (Rahardjo & Adisamita, 2011; Sholihah et al., 2019), namely:

a. Relatively better accessibility.

b. The smoothness of road traffic is still lacking.

c. The disproportionate number of motorized vehicles with the length of the road available, and

d. The low discipline of road users.

These four trends have caused urban congestion to become increasingly serious, which is an urgent demand to be addressed immediately. Efforts to overcome the problem of congestion must be carried out quickly and precisely in its implementation. Congestion for motorized vehicles has negative impacts in various aspects, namely disrupting the smooth flow of traffic, making travel times longer, fuel consumption increasing, and causing air pollution. Congestion will disrupt the smooth flow of urban traffic, the impact will be longer travel times, and as a result, arriving at the destination late. In addition, creating an uncomfortable atmosphere is tiring, and reduces work concentration. This will reduce one's productive time.

The large number of people choosing to use private vehicles rather than public transportation can also cause congestion because the number of vehicles increases. One of the reasons for not choosing public transportation is because the condition of some urban public vehicles is still unsatisfactory, and they feel less comfortable and safe. The large number of motorists who choose to use private vehicles results in an increase in the budget that must be spent by someone to purchase fuel.

2.4. Work environment

The work environment can be interpreted as the overall work facilities and infrastructure around employees who are doing work which can affect the implementation of work. The work environment includes the workplace, facilities, work aids, cleanliness, lighting, and calm, including the working relationship between the people in that place. The work environment can also be interpreted as everything that is around workers who can influence them in carrying out various assigned tasks (Sholihah et al., 2021).

Prawirosentono (2002) explains that there are many benefits of creating a work environment, including:

1. Minimizing the possibility of work accidents that result in losses.
2. Optimizing the use of equipment and raw materials more productively and efficiently
3. Creating conditions that support the comfort and excitement of work, thereby increasing the level of work efficiency. Due to its increased productivity and increased efficiency, it can ensure the continuity of production processes and business ventures.
4. Directing the participation of all parties to create a healthy and good work climate as a foundation that supports the smooth operation of a business.

The work environment can be beneficial in creating work passion so that work productivity increases (Siahaan & Sholihah, 2020). Therefore, a conducive work environment can indirectly improve employee performance and productivity.

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3. RESEARCH METHODS

The population in this study is all UB employees consisting of lecturers and students. The total population in this study was 7,280 people consisting of 2,341 lecturers and 4,939 students. The sample is representative of the population. The sample in this study were lecturers and staff of the Faculty of Administrative Sciences and Economics with the consideration that the number of lecturers and staff is the largest. This sampling was carried out based on the researcher's considerations because not all samples had criteria that matched the phenomenon under study. Therefore, the researcher chose a purposive sampling technique which determined certain considerations or criteria which had to be fulfilled by the samples used in this study, namely:

1. Respondents have at least 1 year in UB
2. Willing to be a research respondent
3. Respondents filled out all the questions completely

The models and hypotheses formed are as follows:

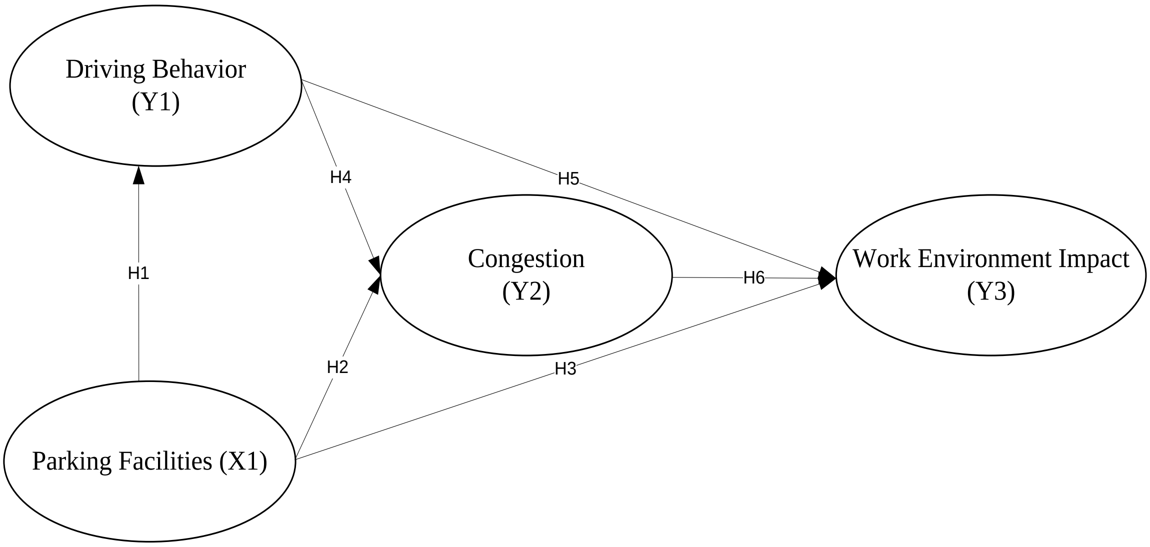

Figure 1: Research Model

The analysis model used is SEM (Structural Equation Modeling) with Multigroup PLS (Partial Least Square) approach. According to Gozali and Hengky (2015), PLS is an alternative approach that shifts from a covariance-based SEM approach to a variant-based one. SEM which is based on covariance generally tests causality or theory, while PLS is more of a predictive model. PLS is an analytical method that can be applied to all data scales, does not require a lot of assumptions, and the sample size does not have to be large. PLS can also be used to explore relationships between variables where the theoretical basis is weak or does not yet exist (proposition testing has not been done) so it can also be used to confirm theories (hypothesis testing). PLS can produce good information so that it can be used either for explanation or prediction or confirmation. The data used in this study consisted of Group 1 (Faculty of Administrative Sciences) and Group 2 (Faculty of Economics and Business), therefore this study used Multigroup SEM-PLS. This research is not based on many assumptions, and the variables in this study are in the form of indicators.

4. RESEARCH RESULT

4.1. Multigroup SEM-PLS Linearity Assumption Test

Linearity testing is carried out using the Curve Fit method, where the reference used is the parsimony principle, that is, if (1) the linear model is significant, (2) the linear model is non-significant, however, all possible models are also non-significant. Model specifications used as the basis for testing are linear, quadratic, cubic, inverse, logarithmic, power, compound, growth, and exponential models. The results of testing the linearity of the relationship between variables are presented in Table 1.

Table 1: Testing Multigroup Linearity Assumptions

No	Connection	Results		Conclusion
		Faculty of Administrative Sciences (Group 1)	Faculty of Economics and Business (Group 2)	
1	Parking Facilities (X1) to Driving Behavior (Y1)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	Significant Linear Model (Linear Sig = 0.001 < 0.05)	linear
2	Parking Facilities (X1) to Congestion (Y2)	Significant Linear Model (Linear Sig = 0.001 < 0.05)	Significant Linear Model (Linear Sig = 0.001 < 0.05)	linear
3	Parking Facilities (X1) to Work Environment Impact (Y3)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	linear
4	Driving Behavior (Y1) to Congestion (Y2)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	linear
5	Driving Behavior (Y1) to Work Environment Impact (Y3)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	linear
6	Congestion (Y2) to Work Environment Impact (Y3)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	Significant Linear Model (Linear Sig = 0.000 < 0.05)	linear

Source: Primary Data Processed, 2023

The results of the linearity assumption test in Table 1 show that the six relationships of each group are good at the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2) which were formed show that the linear model is significant (sig linear model <0.05), which indicates that the assumption of linearity of the relationship between variables in this study is fulfilled. Given that in PLS, the relationship used is in a linear form.

4.2. The Goodness of Fit Multigroup SEM-PLS

The feasibility of the research model can be proven by looking at the analysis of the multivariate determination coefficient expressed by Q-Square (Q^2). Q-Square is a measure of how well the observations made give results to the research model. $Q^2 > 0$ indicates the model has predictive relevance. The criteria for the strength and weakness of the model are measured based on the Q-square predictive relevance value which ranges from 0 (zero) to one (Pranata et al., 2020). The closer to 0 the value of Q-Square predictive relevance indicates that the research model is getting weaker, conversely the further away from 0 (zero), and the closer it is to a value of 1

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(one), it means that the research model is getting better. Based on the R2 value, Q2 or the Stone Geiser Q-Square test for Multigroup SEM-PLS can be calculated, namely:

Table 2: The Goodness of Fit SEM-PLS Multigroup

Faculty of Administrative Sciences (Group 1)	Faculty of Economics and Business (Group 2)
Q2 = 1 – (1 – R12) (1 – R22) (1 – R32) Q2 = 1 – (1 – 0.421) (1 – 0.120) (1– 0.592) = 0.7912	Q2 = 1 – (1 – R12) (1 – R22) (1 – R32) Q2 = 1 – (1 – 0.159) (1 – 0.467) (1– 0.542) = 0.7947

Source: Primary Data Processed, 2023

The calculation results show the valueQ-Square predictive relevance for the Faculty of Administrative Sciences (Group 1) of 0.7912 or 79.12% and the Faculty of Economics and Business (Group 2) of 0.7947 or 79.47%. The Q-Square value of predictive relevance also indicates that the diversity of data that can be explained by the model at the Faculty of Administrative Sciences (Group 1) is 79.12% or in other words the information contained in the data is 79.12% can be explained by the model at the Faculty of Science Administration (Group 1). While the remaining 20.88% is explained by other variables (which are not included in the model) and errors in the Faculty of Administrative Sciences (Group 1). The predictive relevance Q-Square value at the Faculty of Economics and Business (Group 2) produces a value of 79.47% or in other words the information contained in the data is 79, 47% can be explained by the model at the Faculty of Economics and Business (Group 2) and the remaining 20.53% is explained by other variables (which have not been contained in the model) and errors. Thus the model that has been formed is appropriate.

4.3. Outer Model (Measurement Model) Multigroup SEM-PLS

The first part of the SEM analysis is the interpretation of the measurement model or outer model. The measurement model presents variable measurements (as unobservable variables) of each measuring indicator (as observable variables). The measurement model is carried out on each research variable. This measurement model is equivalent to Confirmatory Factor Analysis (CFA). The coefficient of measurement model or called the loading factor states the magnitude/ contribution of the indicator as a measure of the variable. The indicator with the highest loading factor indicates that the indicator is the strongest gauge for the variable being measured. The indicator is declared significant as a measure of the variable if the p-value is <0.05, or the indicator is declared fixed.

1) Parking Facility Variable (X1) Multigroup

In the first part, a multigroup Parking Facility (X1) variable measurement model is presented, namely the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). This variable can be measured by three indicators, namely Parking Location (X1.1), Ease of Access to Parking (Availability of Parking Areas) (X1.2), and Affordability (X1.3). The multigroup Parking Facility (X1) measurement model is presented in the following table.

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Table 3: Multi-group Parking Facility Variable Measurement Model (X1).

Indicator	Faculty of Administrative Sciences (Group 1)			Faculty of Economics and Business (Group 2)		
	Loading Factor	***P-values***	**Conclusion**	***Loading Factor***	***P-values***	**Conclusion**
Parking Location (X1.1)	0.857	0.000	Significant	0.918	0.000	Significant
Ease of Access to Parking (Availability of Parking Areas) (X1.2)	0.796	0.000	Significant	0.911	0.000	Significant
Affordability (X1.3)	0.940	0.000	Significant	0.942	0.000	Significant
AVE	0.751			0.853		
Composite Reliability	0.900			0.946		
Alpha Cronbach	0.833			0.914		

Source: Primary Data Processed, 2023

Variable indicators of Parking Facilities (X1) Multigroup namely Parking Location (X1.1), Ease of Access to Parking (Availability of Parking Areas) (X1.2), and Affordability (X1.3) are declared significant as a measure of the variable Parking Facilities (X1) in the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). The three indicators in Group 1 and Group 2 have positive loading factor values and p-values <0.05 (significant). This means that the indicators of Parking Facilities (X1) in the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2) are significant as a measure of the Parking Facilities variable (X1). Due to the positive loading factor coefficient, it indicates that the high and low parking facilities (X1) are determined by the high and low wide parking location, ease of access to parking or availability of parking space, and affordability, namely the ease of finding parking spaces at the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). The Affordability Indicator (X1.3) is the strongest measure of the Parking Facility variable (X1) at the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2) because it has the highest factor loading coefficient. This can be interpreted that the assessment of the Parking Facility variable (X1) can be seen from the high affordability (X1.3) at the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). In addition, the Parking Facilities variable (X1) at the Faculty of Administrative Sciences (Group 1) obtained an AVE value of 0.751, a composite reliability value of 0.900, and a cronbach alpha value of 0. 833 which met the measurement requirements. The Faculty of Economics and Business (Group 2) obtained an AVE score of 0.853, a composite reliability score of 0.946, and a cronbach alpha score of 0.914 which met the measurement requirements.

2) Driving Behavior Variable (Y1) Multigroup

The second part is shown by the Multigroup Driving Behavior (Y1) variable measurement model, namely the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). This variable can be measured by five indicators, namely Encountering Other Vehicles (Y1.1), How to Turn (Y1.2), How to Park the Vehicle (Y1.3), How to Pass/Overtake Vehicles (Y1.4), and Response from

Signs Traffic (Y1.5). Table 4 below presents the driving behavior variable measurement model (Y1).

Table 4: Driving Behavior Variable Measurement Model (Y1) Multigroup

Indicator	Faculty of Administrative Sciences (Group 1)			Faculty of Economics and Business (Group 2)		
	Loading Factor	***P-values***	**Conclusion**	***Loading Factor***	***P-values***	**Conclusion**
Encounter with Other Vehicles (Y1.1)	0.888	0.000	Significant	0.950	0.000	Significant
Turn Way (Y1.2)	0.888	0.000	Significant	0.882	0.000	Significant
How to Park the Vehicle (Y1.3)	0.986	0.000	Significant	0.917	0.000	Significant
How to Pass/Overtake Vehicles (Y1.4)	0.977	0.000	Significant	0.913	0.000	Significant
Response from Traffic Signs (Y1.5)	0.753	0.000	Significant	0.880	0.000	Significant
AVE	0.814			0.826		
Composite Reliability	0.956			0.960		
Alpha Cronbach	0.940			0.947		

Source: Primary Data Processed, 2023

Indicators for measuring the variable Driving Behavior (Y1) Multigroup, namely Passing by Other Vehicles (Y1.1), How to Turn (Y1.2), How to Park a Vehicle (Y1.3), How to Pass/Overtake Vehicles (Y1.4), and Response of Traffic Signs (Y1.5) has a positive loading factor value and p-value <0.05 (significant) at the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). This means that the five indicators are significant as a measure of the driving behavior variable (Y1) in the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). Because the loading factor coefficient is positive, it indicates that the good or not of Driving Behavior (Y1) in the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2) is determined by whether or not UB's people currently encounter another vehicle, how to turn while driving, how to park a vehicle, how to pass/overtake vehicles, as well as the response from traffic signs.

The highest loading factor coefficient is obtained in How to Park a Vehicle (Y1.3) as the strongest gauge of Driving Behavior (Y1) at the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2) the indicator that is the strongest gauge is Vehicle Passing Another (Y1.1). That is, driving behavior (Y1) at the Faculty of Administrative Sciences (Group 1) is mainly seen from how to park a vehicle (Y1.3), and at the Faculty of Economics and Business (Group 2) is shown by meeting other vehicles (Y1.1). In Table 4 it is also known that the AVE value at the Faculty of Administrative Sciences (Group 1) is 0.814. In addition, it also obtained at the Faculty of Administrative Sciences (Group 1) a composite reliability value of 0.956 and a Cronbach alpha value of 0.940 which met the measurement requirements.

3) Multigroup Congestion Variable (Y2).

The next section presents a multigroup measurement model for the Congestion variable (Y2), namely the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2) as measured by four indicators, namely the Number of Vehicles (Y2.1), Speed (Y2.2), Accessibility (Y2.3), and Road Network

(Y2.4). Table 5 below presents a measurement model for the Congestion variable (Y2).

Table 5: Multigroup Congestion Variable Measurement Model (Y2).

Indicator	Faculty of Administrative Sciences (Group 1)			Faculty of Economics and Business (Group 2)		
	Loading Factor	***P-values***	**Conclusion**	***Loading Factor***	***P-values***	**Conclusion**
Number of Vehicles (Y2.1)	0.452	0.000	Significant	0.394	0.000	Significant
Speed (Y2.2)	0.941	0.000	Significant	0.890	0.000	Significant
Accessibility (Y2.3)	0.859	0.000	Significant	0.714	0.000	Significant
Road Network (Y2.4)	0.980	0.000	Significant	0.809	0.000	Significant
AVE	0.697			0.528		
Composite Reliability	0.896			0.807		
Alpha Cronbach	0.831			0.694		

Source: Primary Data Processed, 2023

Based on Table 5, the indicators for the Number of Vehicles (Y2.1), Speed (Y2.2), Accessibility (Y2.3), and Road Network (Y2.4) which measure the variable Congestion (Y2) Multigroup obtain a positive loading factor value and p-value < 0.05 (significant). That is, the four indicators are declared significant in measuring the variable Congestion (Y2) at the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). The positive loading factor coefficient indicates that the Congestion condition (Y2) is determined by the level of the number of vehicles, the speed of the driver, the accessibility of the vehicle, and the road network in the area of the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2) Universitas Brawijaya.

The highest loading factor value of the Faculty of Administrative Sciences (Group 1) is on the Road Network indicator (Y2.4). At the Faculty of Economics and Business (Group 2) the loading factor value is the Speed indicator (Y2.2). This means that the good Road Network indicator (Y2.4) is the main indicator that shows the variable Congestion (Y2) in the Faculty of Administrative Sciences (Group 1). Whereas in the Faculty of Economics and Business (Group 2) it is high indicator Speed (Y2.2) is the main indicator showing variable Congestion (Y2). In addition, at the Faculty of Administrative Sciences (Group 1) information was obtained that the AVE value was 0.697, the composite reliability value was 0.896, and the Cronbach alpha value was 0.831 which fulfilled the measurement requirements. And at the Faculty of Economics and Business (Group 2) an AVE value of 0.528 was obtained, a composite reliability value of 0.807, and a cronbach alpha value of 0.697 which fulfilled the measurement requirements.

4) Work Environment Impact Variable (Y3) Multigroup

The last section presents the fourth measurement model, namely the Multigroup Work Environment Impact (Y3) variable consisting of the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics and Business (Group 2). This variable is measured by five indicators, namely the Impact of Physical Work Environment (Y3.1), Non-Physical Work Environment (Y3.2), Work Motivation (Y3.3), Level of Work Stress (Y3.4), and Physical Conditions (Y3. 5). The multi-group Work Environment Impact (Y3) measurement model is presented in the following table.

Table 6: Work Environment Impact Variable Measurement Model (Y3)*Multigroup*

Indicator	Faculty of Administrative Sciences (Group 1)			Faculty of Economics and Business (Group 2)		
	Loading Factor	***P-values***	**Conclusion**	***Loading Factor***	***P-values***	**Conclusion**
Impact of Physical Work Environment (Y3.1)	0.999	0.004	Significant	0.816	0.000	Significant
Non-Physical Work Environment (Y3.2)	0.999	0.000	Significant	0.852	0.000	Significant
Work Motivation (Y3.3)	0.986	0.000	Significant	0.863	0.000	Significant
Work Stress Level (Y3.4)	0.999	0.000	Significant	0.928	0.000	Significant
Physical Condition (Y3.5)	0.999	0.000	Significant	0.913	0.000	Significant
AVE	0.993			0.766		
Composite Reliability	0.999			0.942		
Alpha Cronbach	0.998			0.923		

Source: Primary Data Processed, 2023

Based on Table 6, it is known that the five indicators of the variable Work Environment Impact (Y3)in the Faculty of Administrative Sciences (Group 1) have a positive loading factor value and p-value <0.05, which can be stated as significant. This means that the five indicators are significant as a measure of the Work Environment Impact variable (Y3) at the Faculty of Administrative Sciences (Group 1). Because the loading factor coefficient is positive, it indicates that whether or not the Work Environment Impact (Y3) is determined by whether it is good or not the impact of the physical work environment, the impact of the non-physical work environment, work motivation, level of work stress, and the physical condition of UB residents in the area of the Faculty of Administrative Sciences (Group 1) Universitas Brawijaya.

Indicator Impact of Physical Work Environment (Y3.1), Non-Physical Work Environment (Y3.2), Work Stress Level (Y3.4), and Physical Conditions (Y3.5) are the strongest variables Work Environment Impact (Y3) because it has the highest loading factor coefficient of 0.999.

This means that assessment variable Work Environment Impact (Y3) seen from the height Impact of Physical Work Environment (Y3.1), Non-Physical Work Environment (Y3.2), Level of Work Stress (Y3.4), and Physical Conditions (Y3.5) UB residents in area Faculty of Administrative Sciences (Group 1) Universitas Brawijaya. In addition, the Work Environment Impact variable (Y3) obtained an AVE value of 0.993, a composite reliability value of 0.999, and a Cronbach alpha value of 0.998 which met the measurement requirements.

At the Faculty of Economics and Business (Group 2), the five indicators that measure the variable Work Environment Impact (Y3) are Impact of Physical Work Environment (Y3.1), Non-Physical Work Environment (Y3.2), Work Motivation (Y3.3), Level of Work Stress (Y3.4), and Physical Conditions (Y3.5).

These indicators are declared significant as a measure variable Work Environment Impact (Y3) because of the p-value < 0.05 (significant). In addition, it was found that the loading factor values of the five indicators were positive. This means that whether the Work Environment Impact (Y3) is good or not is determined by whether it is good or not the impact of the physical work environment, the impact of the non-physical work environment, work motivation, the level of work stress, and the physical condition of UB residents in the area Faculty of Economics and Business (Group 2) Brawijaya University.

Indicator The level of work stress (Y3.4) is the strongest measure of the variable Work Environment Impact (Y3) because it has the highest factor loading coefficient. This means that the assessment variable Work Environment Impact (Y3) is seen from the height Work Stress Level (Y3.4) UB residents in the area Faculty of Economics and Business (Group 2) Brawijaya University. In addition, the Work Environment Impact variable (Y3) obtained an AVE value of 0.766, a composite reliability value of 0.942, and a Cronbach alpha value of 0.913 which met the measurement requirements.

4.4. Inner Model (Structural Model) Multigroup SEM-PLS

The structural model presents the relationship between research variables. The structural model coefficients state the magnitude of the relationship between one variable and another. There is a significant influence between one variable on another variable if the p-value <0.05.

The results of the multigroup structural model are presented in full in Table 7, Figure 2 for the Faculty of Administrative Sciences (Group 1) and the Faculty of Economics (Group 2) in Figure 3.

Table 7: Multigroup SEM-PLS Structural Model

No	Variable Relations	Faculty of Administrative Sciences (Group 1)			Faculty of Economics and Business (Group 2)		
		Coefficient	*P-values*	Con.	Coefficient	*P-values*	Con.
1	Parking Facility (X1) to Driving Behavior (Y1)	0.655	0.000	Sig.	0.417	0.000	Sig.
2	Parking Facility (X1) to Congestion (Y2)	0.015	0.925	No Sig.	0.691	0.000	Sig.
3	Parking Facility (X1) to Work Environment Impact (Y3)	0.185	0.090	No Sig.	0.669	0.000	Sig.
4	Driving Behavior (Y1) to Congestion (Y2)	0.371	0.022	Sig.	0.014	0.850	No Sig.
5	Driving Behavior (Y1) to Work Environment Impact (Y3)	0.525	0.000	Sig.	-0.052	0.433	No Sig.
6	Congestion (Y2) to Work Environment Impact (Y3)	0.236	0.022	Sig.	0.139	0.367	No Sig.

Source: Primary Data Processed, 2023

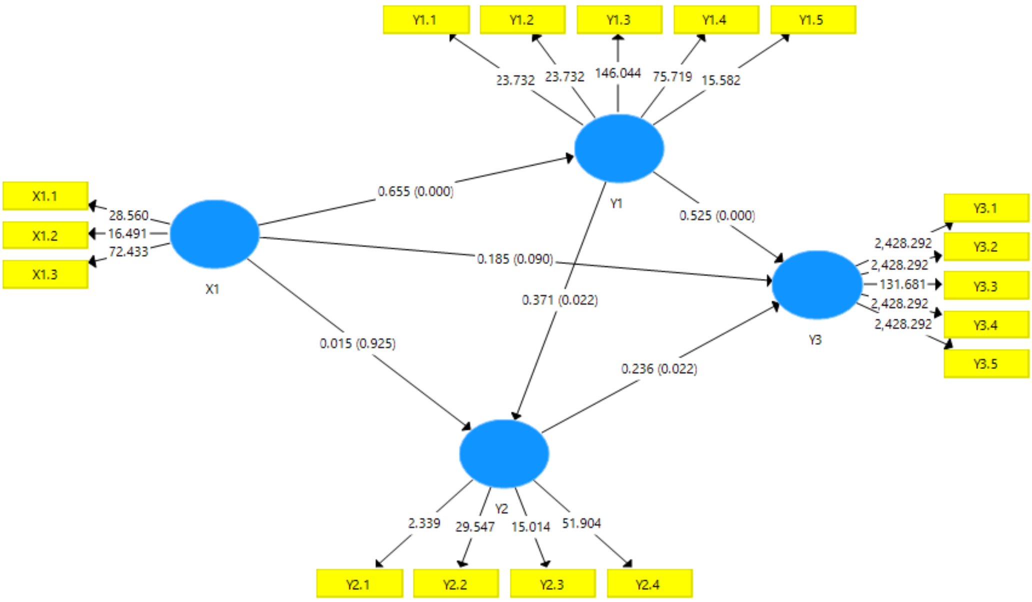

Figure 2: SEM-PLS Structural Model of the Faculty of Administrative Sciences (Group 1)

Source: (Primary Data Processed, 2023)

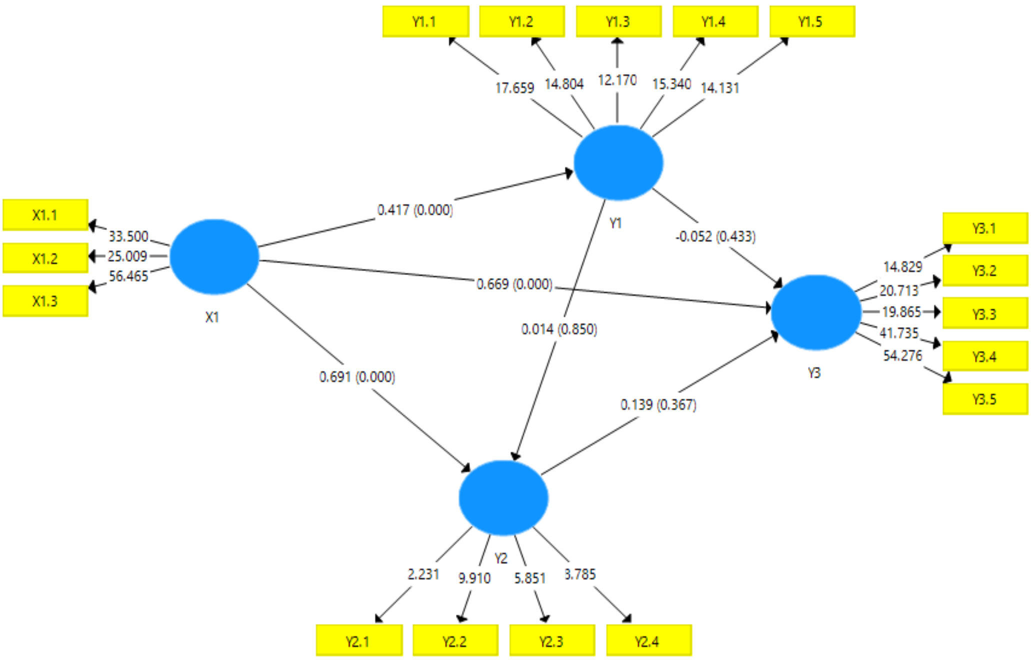

Figure 3: SEM-PLS Structural Model of the Faculty of Economics and Business (Group 2)

Source: (Primary Data Processed, 2023)

The SEM-PLS structural model formed in the Faculty of Administrative Sciences (Group 1):

$Y1 = 0.655\ X1 + \zeta_1$

$Y2 = 0.015\ X1 + 0.371\ Y1 + \zeta_2$

$Y3 = 0.185\ X1 + 0.525\ Y1 + 0.236\ Y2 + \zeta_3$

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The SEM-PLS structural model formed in the Faculty of Economics and Business (Group 2):

$Y1 = 0.417\ X1 + \zeta_1$

$Y2 = 0.691\ X1 + 0.014\ Y1 + \zeta_2$

$Y3 = 0.669\ X1 – 0.052\ Y1 + 0.139\ Y2 + \zeta_3$

The results of testing the direct influence structural model as presented in Table 7, Figure 2, and Figure 3 are as follows:

1. Influence Parking Facility (X1) to Driving Behavior (Y1), obtained a structural coefficient of 0.655, and a p-value of 0.000 at the Faculty of Administrative Sciences (Group 1). Because the p-value <0.05, and the coefficient is positive indicating that there is a significant and positive effect between Parking Facility (X1) to Driving Behavior (Y1). The better/broader Parking Facility (X1), the result is even better Driving Behavior (Y1) in the Faculty of Administrative Sciences (Group 1). At the Faculty of Economics and Business (Group 2), influence Parking Facility (X1) to Driving Behavior (Y1), obtained a structural coefficient of 0.417, and a p-value of 0.000. Because the p-value <0.05, and the coefficient is positive indicating that there is a significant and positive effect between Parking Facility (X1) to Driving Behavior (Y1). The better/broader Parking Facility (X1), the result is even better Driving Behavior (Y1) at the Faculty of Economics and Business (Group 2).
2. Influence Parking Facility (X1) to Congestion (Y2), obtained a structural coefficient of 0.015, and a p-value of 0.095. Because the p-value > 0.05, it means that there is no effect significant variable Parking Facilities (X1) to Congestion (Y2) in the Faculty of Administrative Sciences (Group 1). This indicates that the better/more widespread parking facility (X1), will have no significant effect on congestion conditions (Y2) in the Faculty of Administrative Sciences (Group 1) Universitas Brawijaya. Whereas the influence of Parking Facility (X1) to Congestion (Y2) at the Faculty of Economics and Business (Group 2), obtained a structural coefficient of 0.691, and a p-value of 0.000. Because the p-value <0.05 and the structural coefficient is positive, it means that there is an influence significant and positive variable Parking Facilities (X1) to Congestion (Y2). This indicates that the better/more widespread the Parking Facility (X1), the better the Congestion conditions (Y2) in the Faculty of Economics and Business (Group 2).
3. Influence Parking Facility (X1) to Work Environment Impact (Y3) on Faculty of Administrative Sciences (Group 1), obtained a structural coefficient of 0.185, and a p-value of 0.090. Because the p-value > 0.05, indicates that there is no significant effect between Parking Facility (X1) to Work Environment Impact (Y3). The more good/wide Parking Facilities (X1), so will not affect the high low Work Environment Impact (Y3) in the Faculty of Administrative Sciences (Group 1) Universitas Brawijaya. Meanwhile in the Faculty of Economics and Business (Group 2), the influence of Parking Facility (X1) to Work Environment Impact (Y3), obtained a structural coefficient of 0.669, and a p-value of 0.000. Because the p-value <0.05, and the coefficient is positive indicating that there is a significant and positive effect between Parking Facility (X1) to Work Environment Impact (Y3). The more good/wide Parking Facilities (X1), the result is even better the Work Environment Impact (Y3) in the Faculty of Economics and Business (Group 2) Universitas Brawijaya.

4. Influence of Driving Behavior (Y1) to Congestion (Y2), obtained a structural coefficient of 0.371 and a p-value of 0.022 in the Faculty of Administrative Sciences (Group 1). Because the p-value <0.05 and the structural coefficient is positive, it means that there is an influence significant and positive driving behavior variable (Y1) to Congestion (Y2). This indicates that the better the Driving Behavior (Y1) of UB residents in Faculty of Administrative Sciences (Group 1) Brawijaya University, will cause the level of conditioning Congestion (Y2). Whereas in the Faculty of Economics and Business (Group 2), the influence of Driving Behavior (Y1) to Congestion (Y2), obtained a structural coefficient of 0.014 and a p-value of 0.850. Because the p-value > 0.05 and the structural coefficient is positive, it means that there is no effect significant and positive driving behavior variable (Y1) to Congestion (Y2). This indicates that the good Driving Behavior (Y1) of UB residents in the Faculty of Economics and Business (Group 2) Universitas Brawijaya, does not affect conditions Congestion (Y2).
5. At the Faculty of Administrative Sciences (Group 1), influence Driving Behavior (Y1) to Work Environment Impact (Y3) obtained a structural coefficient of 0.525, and a p-value of 0.000. Because the p-value <0.05 and the coefficient is positive indicating that there is a significant and positive effect between driving Behavior (Y1) to Work Environment Impact (Y3). the better Driving Behavior (Y1) of UB residents in Faculty of Administrative Sciences (Group 1) Brawijaya University, then it will be a good Work Environment Impact (Y3). While influencing Driving Behavior (Y1) to Impact of the Work Environment (Y3) on the Faculty of Economics and Business (Group 2), obtained a structural coefficient of-0.052, and p-value 0.433. Because the p-value > 0.05 and the coefficient is negative indicating that there is no significant and negative effect between Driving Behavior (Y1) to Work Environment Impact (Y3). the better Driving Behavior (Y1) of UB residents in the Faculty of Economics and Business (Group 2) Universitas Brawijaya, then it will not result in either or notWork Environment Impact (Y3).
6. Effect of Congestion (Y2) to Work Environment Impact (Y3) on the Faculty of Administrative Sciences (Group 1), obtained a structural coefficient of 0.236 and a p-value of 0.022. Because the p-value <0.05 and the structural coefficient is positive, it means that there is an influence significant and positive variable Congestion (Y2) to Work Environment Impact (Y3). This indicates that the Congestion level (Y2) is getting conditioned in the area faculty of Administrative Sciences (Group 1) Brawijaya University, which will result in a good Work Environment Impact (Y3). Whereas in the Faculty of Economics and Business (Group 2), the effect of Congestion (Y2) to Work Environment Impact (Y3), obtained a structural coefficient of 0.139 and a p-value of 0.367. Because the p-value > 0.05 and the structural coefficient is positive, it means that there is no effect significant and positive variable Congestion (Y2) to Work Environment Impact (Y3). This indicates that the conditioned Congestion level (Y2) in the area of the Faculty of Economics and Business (Group 2) Universitas Brawijaya will not affect whether or not the Work Environment Impact (Y3) is good.

5. DISCUSSION

From the results of the goodness of fit, it is known that the Q square value of all models shows a value above 50% so it can be said that all models formed can be said to be good/strong. However, if you look at the highest Q square value, the result is that the model at the Faculty of Economics and Business (Group 2) is the best model with a Q square value of 79.47%.

Based on the results of student interviews, information was obtained that congestion at Brawijaya University could disrupt teaching and learning activities. This is due to the queues for access to enter the gates of Brawijaya University during certain hours, the difficulty of finding parking, the lack of parking facilities, and the distance from the parking area to the class where they study. It's not uncommon for them to be late for class, just because of the difficulty in finding a parking area due to the large number of vehicles entering Brawijaya University. In addition, the large number of motorized vehicles causes air pollution felt by students.

This incident can disturb the comfort and health of students. Congestion that occurs also has an impact on student stress levels which can reduce their concentration while studying in class so that learning activities are less than optimal. The hope of students for stakeholders who can determine policies is to pay attention to parking facilities which will have an impact on congestion and the work environment that occurs so that they feel comfortable and safe when they are in the UB campus area.

In line with this, in this model, it is known that the Parking Facility variable is the most dominant variable influencing both Driving Behavior and Congestion and also the Impact of the Work Environment. Meanwhile, the strongest indicator for measuring parking facilities (X1) is the affordability indicator for parking locations and work areas (X1.3) in terms of the measurement model. This is in line with the research of Mianti and Budiwitjaksono (2021) which states that the perception of choosing a parking area affects performance.

The indicator of the affordability of parking locations with work areas needs to be considered or improved again because it is the strongest indicator in measuring parking facilities at Brawijaya University. Therefore, the affordability of parking locations with work areas can be used as a consideration for Universitas Brawijaya to be able to provide comfortable and strategic parking lots for campus residents while still paying attention to the health conditions of the campus environment to create a campus atmosphere that is safe, comfortable and healthy.

The following are recommendations for parking models and policies that can be conveyed by researchers based on research results obtained for the campus in reducing congestion in the Brawijaya University area, namely:

1. Maximize parking space and recommend parking lots, so that it can reduce the expansion of parking areas and can be replaced with a green environment (for example in the parking lot of the Faculty of Economics and Business and around the main library of Universitas Brawijaya).
2. Making facilities for the convenience of UB residents who walk to campus, for example, making galvalume connected to each faculty so that pedestrians can be comfortable from the hot sun and rain.

3. Maximizing the existence of former shelters that provide internal public transportation by making it centralized at several points (especially at the gates of Jalan Veteran, Jalan Panjaitan, and Jalan MT Haryono where public transportation passes), then providing internal public transportation for UB residents that is environmentally friendly, for example bicycles or electric vehicle.
4. Providing surveillance cameras or CCTV to be able to monitor the driving behavior of UB residents in the Universitas Brawijaya area.
5. Paying attention to vehicles parked in the area of Universitas Brawijaya whether they are UB citizens or not, for example by prohibiting online motorcycle taxis or online drivers from staying for a long time or entering basecamp in the area of Universitas Brawijaya by leaving a KTP (Identity Card) at the entrance gate, if it reaches 10 the minutes that have not come out must pick up their KTP at the guard post, where the post functions to foster violations of online motorcycle taxis or online drivers that exceed the time limit.
6. Recommended re-submission related to the policy of using stickers for UB residents, this can make it easier for the security guard at the gate to check whether the vehicles that enter are UB citizens or not, so that they can reduce the number of vehicles entering the Universitas Brawijaya area.

6. CONCLUSIONS AND RECOMMENDATIONS

From the Multigroup SEM-PLS modeling it is shown that the best model is obtained in the Faculty of Economics and Business model (Group 2). This is proven based on modeling results which show a Q square value of 79.47%.

The most dominant variable is Parking Facilities, where the strongest indicator in measuring Parking Facilities is the affordability of parking locations to work areas. Therefore, the indicator of the affordability of parking locations can be used as consideration for Universitas Brawijaya to be able to provide comfortable and strategic parking lots for campus residents.

The hope, in this case, is that Universitas Brawijaya makes new policies to reduce the number of vehicles and improve the road network so that it can condition the congestion that occurs. Efforts to overcome the problem of congestion must be carried out quickly and precisely in its implementation.

Congestion can have a negative impact in various aspects, namely disrupting the smooth flow of traffic, longer travel times, increasing fuel consumption, and causing air pollution. Congestion also results in longer travel times, as a result of arriving at the destination late. In addition, creating an uncomfortable atmosphere is tiring, and reduces work concentration. This will reduce one's productive time.

Indicators of the affordability of parking locations can be used as consideration for Universitas Brawijaya to be able to provide comfortable and strategic parking lots for campus residents while still paying attention to the health conditions of the campus environment to create a campus atmosphere that is safe, comfortable and healthy.

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