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Structural Equation Modeling: The Influence of School Environment on Students' Interest in Selecting State University

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ABSTRACT

Despite prior research on student interest in colleges, this study focuses specifically on how the school environment, including individual factors, friends, and teachers, influences students' interest in attending a state university. Understanding these influences can help improve educational systems to better guide students towards higher education. This study aims to determine the influence of the school environment on students' interest in selecting a state university. This research employs a quantitative approach, utilizing structural equation modeling to analyze the relationships between variables. This study examines how a school environment, captured by twelve indicators across individual, friend, and teacher influences, impacts students' interest in state universities. Therefore, data retrieval based on questionnaires is designed accordingly based on latent variables. The sample in this study were 474 high school and vocational school students on the Indonesia-Timor Leste border, which is precisely located in Timor Tengah Utara Regency. The results showed that the school environment that came from individuals, partners, and teachers had a major influence on students' interest in choosing State University. Based on the analysis of structural equations, it was found that individual environments had a direct influence of 98%, partner environments had an indirect influence of 90%, and teachers also indirectly affected 71%. This study contributes to the field by quantifying the distinct influences of individual, peer, and teacher aspects of the school environment on students' interest in attending state universities. This knowledge can inform the development of targeted interventions to improve educational guidance and support student decision-making.

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A. INTRODUCTION

Education has become a necessity for society, especially the improvement for educational standards. This is due to an improvement in the educational standards that is closely linked to the human resource quality (González-Pérez & Ramírez-Montoya, 2022). If the quality of education is good then it will produce high-quality graduates. High-quality human beings are essential to the development of a nation. The success of a nation's development is strongly influenced by education because with education every individual can advance and thrive to have a decent job. Moreover, the education that each individual has is useful for developing his abilities and talents to the maximum. Therefore, indirectly, education enables one to acquire a variety of understanding in various aspects, such as initiative, principles, skills, creativity and

responsibility (Ode & Hiariey, 2024). There are such demands that lay the foundation for students who have completed their education at the secondary level to be able to pursue studies at the college level (Jabeen et al., 2022).

Selecting a college is an important decision in a student's life, as it can significantly affect future lives (Jiang et al., 2020). Higher education is one of the options for continuing studies after the secondary level, where continuation of studies is useful in preparing students to become members of the community who have the academic ability to develop and apply science and technology (Esra & Sevilen, 2021);(Schneider & Deane, 2014). Students' interest in selecting a state university is important, since it is related to academic success and future career. Therefore, the factors that can influence students in selecting a college becomes important to pay attention (Mufida & Effendi, 2019);(Noveli et al., 2023).

Several studies have analysed factors that influence students' interest in selecting colleges such as, Abramovich et al. (2019) conducted factor analysis on student interest in continuing education to college. Fadillah et al. (2019) also conducted research to identify factors forming student interest when Siregar et al. (2023) conducted an analysis of factors of student interest in choosing a Mathematics study program at college. However, some of the factors studied by previous research involve external and internal factors of students, both environment in and out of school. Basically, the school environment is a key aspect for students to be able to develop potential so that it is a major component for the students to have an open mind in selecting a state college (Letawsky et al., 2003). Previous studies did not specifically analyze the main influence that school environment exerts on students' interest in selecting public universities (Fadillah et al., 2019);(Siregar, 2019);(Jabeen et al., 2022).

The school environment that can affect students' interests in selecting state colleges covers came from of individuals, friends and teachers (Yli-Panula et al., 2022). Individual environment is seen based on motivation, academic ability, attitudes and behavior at school (Nor, 2018); (Henderson & Cunningham, 2023). The environment from friends is based on the support and views of friends towards state colleges, besides the participation in extracurricular routine activities and joint learning is also something that can grow the interest of students in selecting state colleges. While the environment of teachers based on an important role in providing information and guidance to students about college choices, as well as academic support from teachers in providing good teaching so as to support students' interest in studying and continuing higher education (Agrey & Lampadan, 2014); (Nor, 2018).

Some of the above-mentioned school environments influence students in selecting state colleges, so students try to be more selective and have a commitment to realizing the choice of the university they want to go to. Based on the problems that originate from the school environment, this research will show the influence of the school environment on students' interest in selecting a state college. The analysis used is structural equation modeling because variables are constructed based on indicators, commonly known as latent variables (Harlow, 2023);(Hair Jr et al., 2021);(Memon et al., 2021);(Simarmata & Chrisinta, 2022). Structural equation analysis is the most reliable approach for identifying factors using latent variables. This research explores the quantifiable influences of the school environment, specifically those of individual characteristics, peer interactions, and teacher support, on students' interest in attending state universities. The knowledge gained from this investigation is intended to inform

the development of targeted interventions that can empower students and educational stakeholders to make well-informed decisions concerning higher education.

B. METHODS

The stages in this study include identifying the problem of what factors are determining students' interests in selecting a college when evaluating the school environment. Next, observations and field surveys were conducted at some secondary schools on the Indonesian-Timor Leste border that are located in the Timor Tengah Utara district. Based on observations and surveys, the sample size of 474 respondents was obtained. Respondents are high school graduates who have the option to pursue education at the university. The next step is to create a research instrument consisting of variables and indicators. Research variables measured by indicators, also known as latent variables, are given in Table 1.

Table 1. Research Variables and Indicators

Latent Variable		Indicators
Variable Type	**Description**	
Exogenous variable	Individuals (X1)	Academic achievement (X11) Discipline (X12) Responsibility (X13) Courage (X14) Politeness (X15)
	Friends (X2)	The academic influence of friends (X21) Extracurricular activity participation (X22) The influence of friends in college selection (X23) Learning group (X24)
	Teachers (X3)	Academic support (X31) Information about state colleges (X32) Care (X33)
Endogenous variables	Student interests (Y1)	Studies program (Y11) Geographical location (Y12) College reputation (Y13)

This study is a quantitative approach, employing a self-administered questionnaire as the primary data collection tool. The questionnaire, meticulously designed to assess the distinct influences of the school environment on students' interest in state universities, is comprised of multiple sections. These sections utilize a set of indicators to capture various aspects, including students' individual characteristics (e.g., academic motivation, self-efficacy regarding college success), peer interactions (e.g., friends' attitudes towards attending state universities, participation in joint learning activities), and teacher support (e.g., perceived quality of instruction, guidance offered on college options). This multi-faceted approach ensures a comprehensive evaluation of the school environment's influence on students' university choices. The questionnaire has undergone rigorous validity and reliability testing to guarantee the accuracy and consistency of the collected data. Once the data collection from the respondents is complete, the data analysis is carried out. The data analysis process carried out to apply SEM to the data that has been collected involves the help of R Software. SEM is one of statistical method that used for evaluation the relationships among latent variables (Rosseel, 2020);(Thakkar, 2020). The data analysis steps carried out in this study are:

1. A conceptual model consisting of latent variables is first constructed. This step lays the foundation for SEM analysis. Here, the theoretical relationships between variables of interest are defined. Latent variables (unobserved constructs) represent underlying factors that influence the observed variables which can be directly measured.
2. A path diagram is then built to represent the conceptual model visually. The path diagram displays both latent and observed variables, along with arrows indicating the hypothesized relationships between them.
3. An examination of CFA (Confirmatory Factor Analysis) is conducted. This step assesses how well the observed variables represent the latent constructs. CFA helps ensure that the measures capture the intended underlying factors.
4. The assumptions underlying SEM are then examined. These assumptions include normality of data and linearity of relationships. In this stage, it is checked if the data meets these assumptions. If not, transformations or alternative SEM methods may be required.
5. The parameters of the measurement and structural models are then assumed. This involves specifying the model parameters, such as path coefficients (strength of relationships) and error variances. Essentially, the mathematical structure of the model is defined.
6. An evaluation of the measurement models is then conducted. This builds upon the previously performed CFA and further evaluates how well the observed variables reflect the latent constructs. It assesses the fit of the measurement model to the data.
7. The structural model is then evaluated. This stage focuses on the overall fit of the entire model (including both measurement and structural parts) to the data. Here, it is determined if the hypothesized relationships between latent variables hold true in the data.
8. Testing of hypotheses is then performed. This stage involves formally testing the specific predictions derived from the conceptual model. Statistical tests are used to assess if the relationships between variables are statistically significant.
9. Conclusions are then drawn. Based on the evaluation of the model fit and hypothesis testing, conclusions about the relationships between the variables are drawn. The results are interpreted in the context of the research question and the limitations of the study.

C. RESULT AND DISCUSSION

School is an ideal place to develop the character and social skills of students, as well as the ones that most influence students' interests in choosing a state college. Therefore, by paying attention to the environmental aspects of the school, it can identify the factors that influence the interests of students in selecting state colleges. In addition, students will be motivated to have an interest in continuing their studies at state colleges. Students who feel accepted, supported, and engaged in learning during school tend to be more motivated for better academic achievement in higher education.

Based on the initial identification of factors of the school environment that originate from individuals (X1), students' interest in selecting state university consists of 5 indicators:

academic achievement (X11), discipline (X12), responsibility (X13), courage (X14), and courtesy (X15). The environment of friends (X2) is composed of 4 indicators: academic influence of friend (X21), participation in extracurricular activities (X22), influence of friend in selection of major (X23), and learning group (X24). The teacher environment (X3) consists of three indicators that are academic support (X31), information about state universities (X32), and concern (X33). The measurement of student interest in selecting state university (Y) consists of three indicators: study program (Y11), geographical location (Y12), and state university reputation (Y13).

Based on the indicators that build the variables X1, X2, X3, and Y, the structural model given in Figure 1 is formed. There are 4 latent variables, consisting of 3 exogenous variables and 1 endogenic variable. The data collected on the basis of these variables is analyzed through structural equation modeling to find out the influence of the school environment on the interest of students in selecting state colleges. The research variables are broken down based on indicators, and the early stages of the analysis of structure equations perform estimates of the formation of the model consisting of a measurement model and a structural model. Estimating the formation of a structural equation model is the stage of analysis in estimating the value of parameters in a model based on the data used (Zhang, 2022). Estimate the parameters in this study using the maximum likelihood assumption (ML) (Harlow, 2023).

Based on the initial identification of school environment factors derived from individual (X1) students in influencing student interest in selecting state university consists of 5 indicators, namely academic achievement (X11), discipline (X12), responsibility (X13), courage (X14), and courtesy (X15). The friend environment (X2) consists of 4 indicators, namely the academic influence of friends (X21), participation in extracurricular activities (X22), the influence of friends in selecting majors (X23), and study groups (X24). Teacher environment (X3) consists of 3 indicators, namely academic support (X31), information about state universities (X32), and concern (X33). While the measure of student interest in selecting state university (Y) consists of 3 indicators, namely study program (Y11), geographical location (Y12), and state university reputation (Y13).

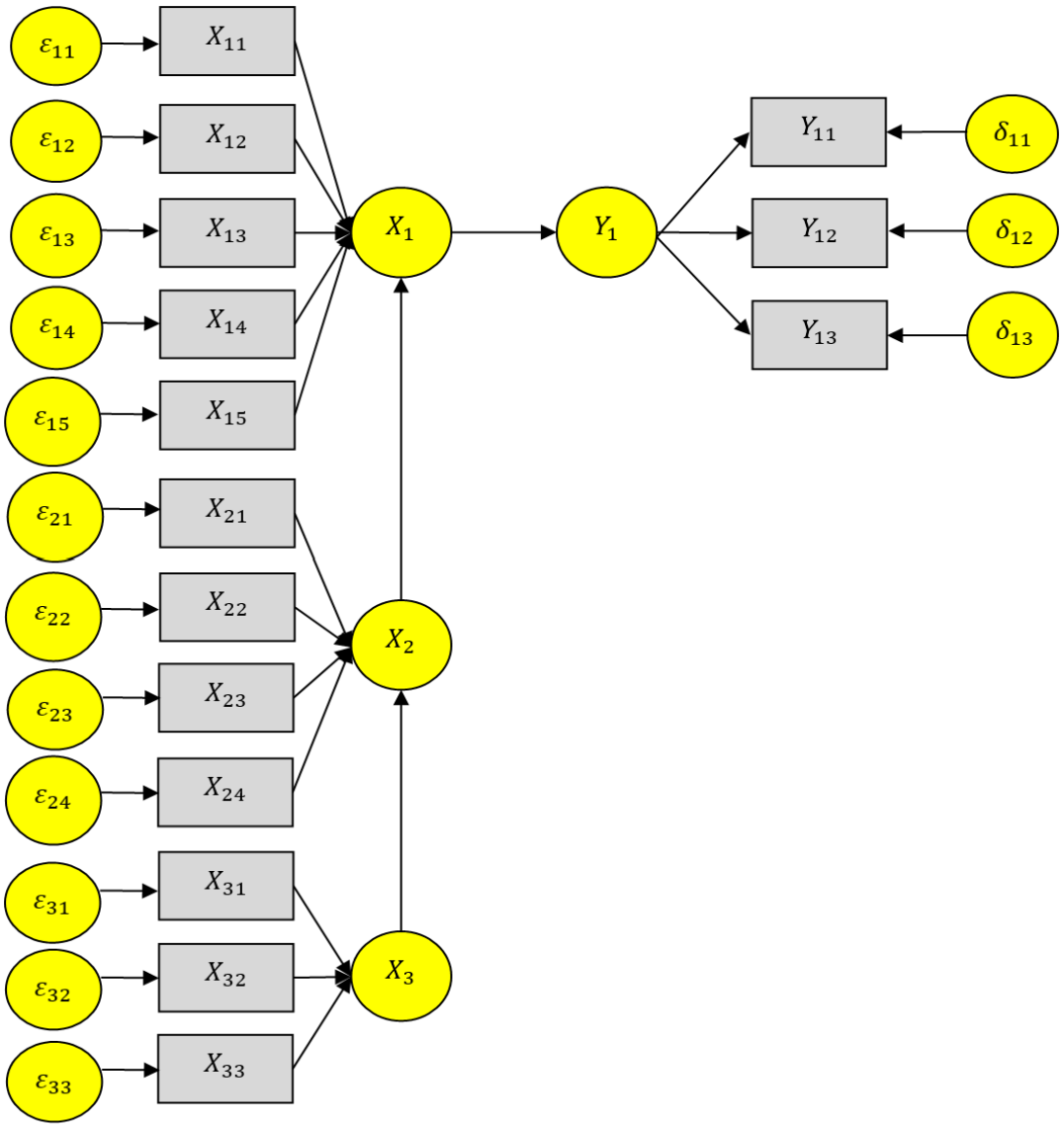

Figure 1. Structural Model of The Influence of School Environment on Students' interest in Selecting State Colleges

The path diagram depicts a chain of hypothesized relationships between latent variables (X1, X2, X3, Y1) represented by arrows. Each latent variable has observed indicators (numbers in parentheses) that measure the underlying concept. The arrows show how changes in X3 might influence X2, which in turn could affect X1 (measured with more detail by its five indicators). Finally, X1 might have an impact on Y1 (measured with three indicators). While the diagram doesn't show error terms or specific equations, it offers a clear visual of how these latent variables might be connected.

The measurement model is used to explain the relationship between a latent variable (not directly measurable) and its indicator (directly measured variable). The primary purpose of the measurement model is to understand how indicators measure or reflect latent variables (Hatcher & O'Rourke, 2013). Testing the measurement model involves estimating factor loadings that measure the strength of the relationship between the latent variable and its indicator and the Cronbach's alpha value used to assess the extent to which the indicators used

in measuring the late variable are consistent and reliable. Low factor loadings (near 0) indicate that the indicator is not good at measuring the latent variable. Whereas, when viewed based on Cronbach's alpha values, a good indicator in constructing the late variable is generally if the value produces a minimum value of 0.70 or more. The following is given in Figure 2: the value of factor loadings and Cronbach's alpha latent variables and their indicators:

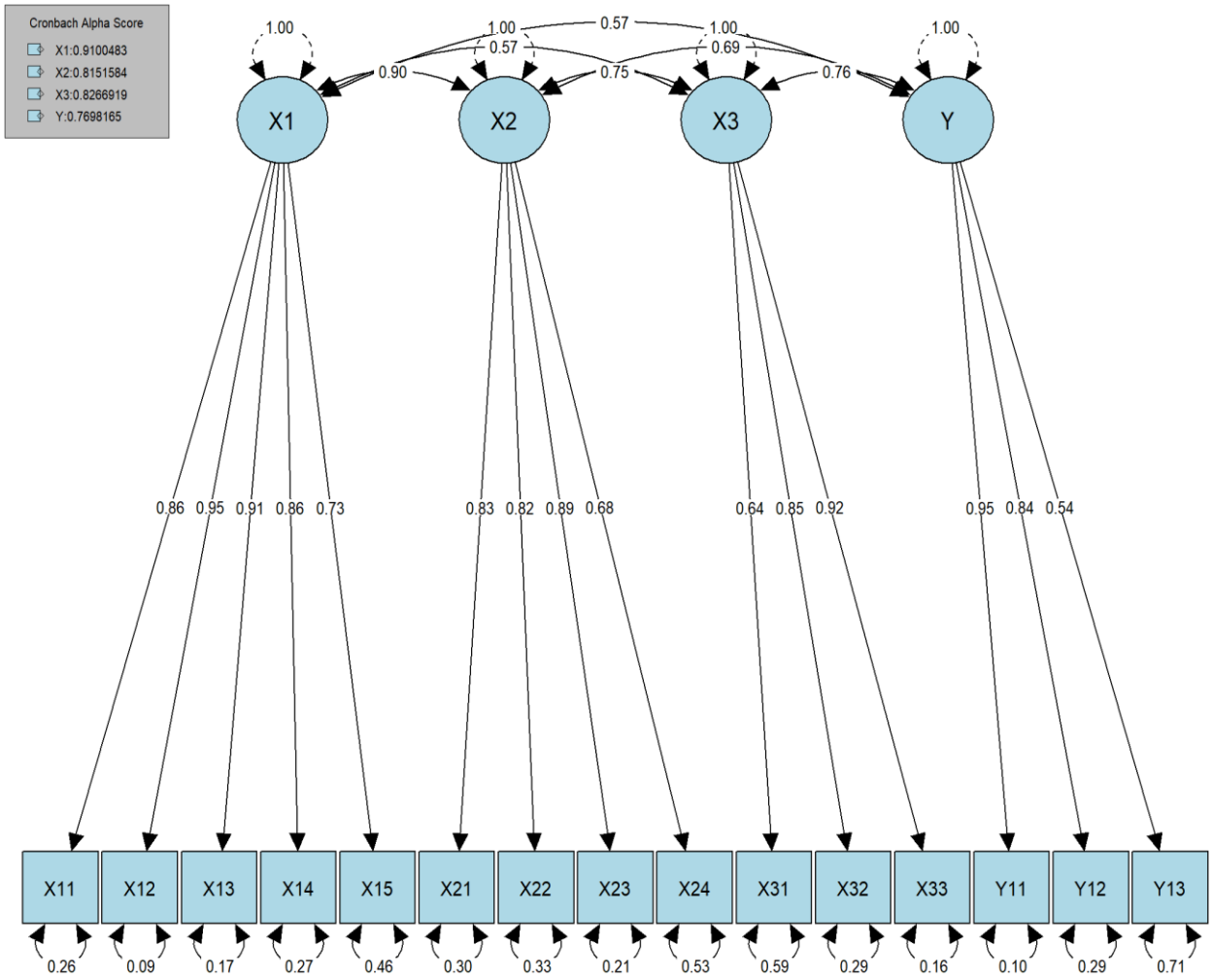

Figure 2. Factor Loadings, Cronbach's Alpha, Latent Variables and Indicators

The result of obtaining factor loading values on the variable X2 is an indicator (X24) that produces a value of 0.68, that is, on the variable of the friend on the learning group indicator. Variable X3 is an indicator (X31) that produces a value of 0.64, that is, on the variable of the teacher on the academic support indicator. On the endogenous variable (Y), there is one indicator (Y13), which yields a value of 0.54. Based on critical values for factor loadings, such indicators are not good at measuring latent variables. However, considering that the indicator is an important aspect in constructing the latent variable, there is no removal of the indicator. Furthermore, this decision is based on a value obtained from Cronbach's alpha, which indicates that the entire latent variable built by the indicator has a value above 0.7, meaning that an indicator is able to construct a late variable well. The test results on the measurement model to see the goodness of the indicator in constructing the latent variable are given in Table 2.

Table 2. Indicator Testing on Latent Variables

Latent Variable Indicators	Estimate	Std.Err	z-value	P(>|z|)	Std.lv	Std.all
X11	2.153	0.104	20.711	0.000	2.153	0.859
X12	1.741	0.070	24.829	0.000	1.741	0.955
X13	1.188	0.052	22.741	0.000	1.188	0.909
X14	1.078	0.052	20.594	0.000	1.078	0.856
X15	0.878	0.054	16.326	0.000	0.878	0.732
X21	1.437	0.073	19.571	0.000	1.437	0.834
X22	0.494	0.026	19.068	0.000	0.494	0.820
X23	1.637	0.075	21.697	0.000	1.637	0.889
X24	1.516	0.103	14.768	0.000	1.516	0.685
X31	1.086	0.081	13.398	0.000	1.086	0.643
X32	1.420	0.073	19.541	0.000	1.420	0.845
X33	1.447	0.065	22.103	0.000	1.447	0.916
Y11	1.647	0.071	23.363	0.000	1.647	0.951
Y12	2.324	0.119	19.480	0.000	2.324	0.844
Y13	0.669	0.062	10.854	0.000	0.669	0.537

Based on Table 2, it can be seen that the value of factor loadings in Figure 2 is derived from the value std.all. Testing on each indicator obtained a value of P-value 0,000 < 5%, which means that the indicator is able to explain the diversity of latent variables as variables that can form a structural model. The next step is to make structural model predictions. The results of the analysis of structural equations using Software R, estimates of path coefficients, and test significance t are given in Table 3.

Table 3. Path Coefficient and t-test

Model	Estimated Value	Path coefficient	P-Value	R^2
X1~X2 (p1)	1.401	0.899	0.000	0.808
X2~X3(p2)	0.994	0.708	0.000	0.501
Y~X1	0.428	0.980	0.000	0.960
Indirect(p1*p2)	1.392	0.636	0.000	-

In Table 3, the estimate value of the structural model is obtained using the regression model approach, path coefficient, and P-value. If the P-value value is < 5%, then it can be said that the estimated value and path coefficient have an influence on the structure model built on the latent variable. The results of the analysis of structural equations showed that the P-value < 5%, meaning that in this study, the path coefficient obtained significantly against the structural model. The overall model is then tested using the Chi-Square Test, Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). The overall test results of the model are given in Table 4.

Table 4. The Overall Model Test

Criterion	Value
Chi-Square Test	0.000
CFI	0.751
TLI	0.700

Based on Table 4, the Chi-Square Test gives a P-value < 5%, which means the model was obtained according to the data used. CFI and TLI values indicate ≥ 0.7, which means that the

model formed sufficiently has a path or influence between the latent variable and its indicator. Therefore, the latent variable relationship that has been tested can be described in detail using the following path diagram (Figure 3).

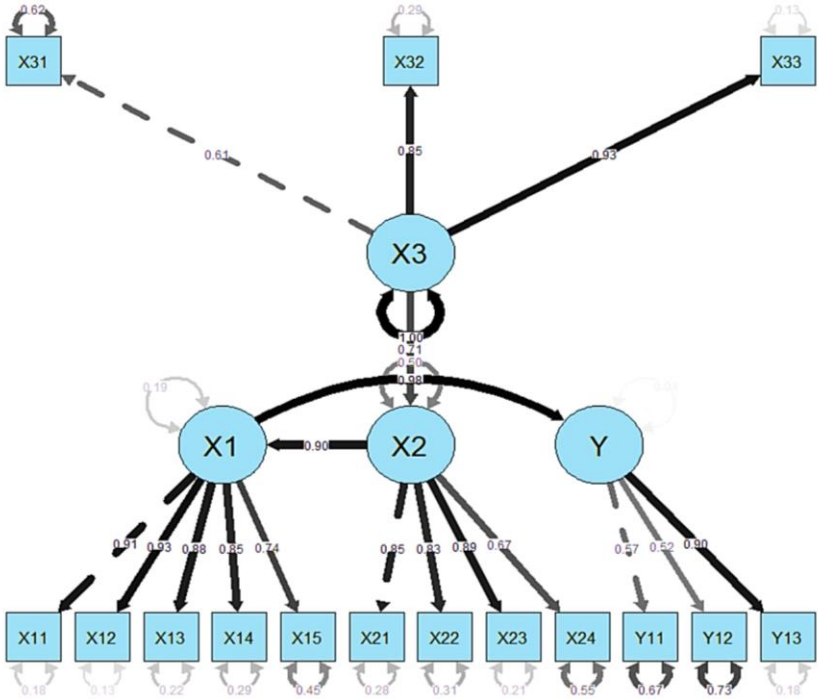

Figure 3. Latent Variable Relationships in Path Diagrams

As shown in Figure 3, the influence of the individual environment during the school environment assessed on the basis of indicators directly influences 98% of growing students' interest in choosing state colleges. Consistent with previous research Tandel et al. (2019), the learning environment is a significant factor influencing students' university selection. Meanwhile, the friend variable given indirectly influences the interest of students in selecting state colleges by 90%. According to Proboyo & Soedarsono (2015), self-motivation, academic ability, and advice from parents and relatives were identified as more influential factors than friends' advice in university selection. While the teacher's environment has an indirect influence on the students' interest in electing state colleges by 71%. Studies such as one by (Jafari & Aliesmaili (2013) highlight the role of school teacher counseling in student university selection. The value obtained on teachers' environment shows the smallest influence, this is because, based on the students' questionnaire answers, not all teachers provide academic support or important information for students' needs in having a view or insight about state college. In fact, teachers focus on learning access at each meeting. Therefore, it can be an evaluation for teachers to be a means for students to have a good view and direction in having academic access to higher levels of education. In general, the results of this study show that the school environment, viewed on the basis of three aspects, namely individuals, friends, and teachers, had a major influence on growing students' interest in selecting a state university. Therefore, the influence of school as a means for students to have motivation for growing interest in continuing studies to a higher level was very influential.

D. CONCLUSION AND SUGGESTIONS

Higher education becomes the choice of the majority of students who have completed their studies well at the level of secondary school education. Therefore, knowing the interest of students in having a state college is an aspect of this research. The main factor that influences students' interests is the school environment, which can come from individuals, friends, and teachers. Based on the analysis of the structural equations obtained, the individual gave a direct influence of 98%, the environment of friends gave an indirect influence of as much as 90%, and the teacher gave the influence indirectly as 71%. This research is limited to three school neighborhoods, so further research can add the environment of facilities provided by the school in order to cultivate the interest of students in continuing studies in state colleges.

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