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Investigating Influential Factors Affecting Students' Achievement in Higher Education Institution System

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Abstract

Instead of focusing on institution ranking, HEI should consider the students' achievements because new students' admission regulation allotted 20% of students registered by using achievement evaluation. In addition, every HEI must report student management, including students' achievements through SIMKATMAWA. Bear in mind, the importance of student management and students' achievement, the aim of this study is to investigate the relationship of factors affecting students' achievement such as new students' state university admission, students' achievement motivation, students' services, reward system, and students' achievement. The researcher used a non-experimental quantitative approach i.e., correlational research. The sample of this study was 78 students of Brawijaya University (UB) who have high achievements. Structural equation modeling (SEM) was chosen as an analytical technique. This study showed a positive relationship between new students' admission, students' service, reward system, and students' achievement. Those variables had a direct relationship. In addition, there was no significant positive relationship between new students' admission for students' achievement motivation, as well as students' service for students' achievement motivation. In sum, this study showed that UB had a good students management system, so that the students can get achievements.

Keywords: achievement motivation, admission system, reward system, students' achievements, students' service

Introduction

The new students' admission to state universities in Indonesia has been regulated in a ministerial regulation each year. Currently, the policy regarding new students' admission is regulated by the Ministry of Education and Culture -Research Technology Regulation Number 48 of 2022. Furthermore, this regulation stipulates that there are three pathways to entry into state universities, the first is SNMPTN which is a selection to enter PTN through the students' achievement evaluation with the provision of 50% average report scores for all subjects, a maximum of 50% interest and talent digging component with a maximum value of 2 (two) achievement supporting subjects or portfolios for arts and sports study programs. The second is the SBMPTN which is a selection to enter state universities by tests measuring reasoning abilities and problem-solving abilities. The third is independent selection, which is an independent selection process held by each state university. However, concerning to the SNMPTN, state universities accept minimally of 20% of the total admissions of new students each year. Thus, all state universities including autonomous universities (PTNBH) have a minimum of 20% of outstanding students each year (Mendikbudristek, 2022). Based on this entry system, it can be concluded that each state university gets qualified new students.

University rank has a very significant impact on attracting prospective new students

Sukmawati, et.al, 2021). One of the efforts to maintain and improve state university rankings is to increase student achievement. Student achievement is one of the components evaluated in the administration of PTNBH profile data shows that the average PTNBH score is 1.04 from a range of 1-4 in the field of student achievement which is recognized nationally or internationally (https://sinta.kemdikbud.go.id/ptnbhanalytics/affiliations/ptnbh). In addition, PTNBH also must report students' achievement at SIMKATMA (national system information management for evaluating higher education students' achievement). Furthermore, the result of this report is ranked to decide the university's rank in student management. Even though student achievement is not the main thing that is assessed in PTNBH and PTNBH towards World Class University (WCU), student achievement needs to be developed (Buela-Casal, et.al, 2007; Margionson, 2007).

Student achievement is a student's advantage compared to other students, and this reflects his/her competence in a particular field. Student competence includes academic and non-academic achievements (Lidia Susanti, 2021; Winkel, 1996). This achievement is a manifestation of student competency in cognitive, affective, and psychomotor aspects (Winkel,1996; Krathwohl, 2002). By referring to the student competency domain, achievement can be divided into academic and non-academic achievements. Academic achievement is a student's excellence in the field of subjects he has taken so far. Academic achievement is more dominant in the cognitive domain (Peng & Kievit, 2020; Liman & Isma'il, 2015). While non-academic achievements are student excellence outside the academic field they are studying. In general, student academic achievement is mostly supported by the affective and psychomotor domains.

Moreover, turning on the implementation of an independent learning-independent campus (MBKM), students' achievements are divided into two based on the process of getting achievements, they are students' achievements from competition and non-competition. Students' achievements from the competition include the competition held by the Ministry of education and culture and students' independent activities. Meanwhile, students' achievements from non-competition are MBKM activities, such as student exchange, internship, research, teaching practice, humanity project, and so forth (Ditjen dikti Kemdikbud, 2021).

On the figure 1 students' achievement become an interesting topic to be investigated. Previous research reported the factors that are affected students' achievement including the selection system for new student admissions (Sulphey, Al-Kahtani, & Syed, 2018; Hossler, et.a;, 2019; Ferrao & Almeida, 2019; Hakkinen, 2004), achievement motivation (Bakar, et.al, 2010; Suswanto, Astani, & Wibawa, 2017; Perry, et.al, 1993; Yazsani & Sane Godbole, 2014; Yusuf, 2011), students' services (Lee, at.al, 2009; Cox & Strange, 2010; Sumarsono, Maisyaroh, & Kusumaningrum, 2021; Quinn, et.al, 2009; Griadhi, et.al, 2018), and reward system (Angrist & Oreopoulos, 2009; Wilson & Corpus, 2001; Chao, et.al, 2017; Baranek, 1996).

In the last few decades, the number of college applicants has been increasing. This is because the government as a policy maker and parents perceive higher education as a valuable investment (Guskey, 2013; Delavande, Del Bono, & Holford, 2022). In Indonesia, new students' admission consists of three paths, namely the achievement path, the test path, and independent selection (Mendikbudristek, 2022). The government stipulates that acceptance of achievement pathways is at least 20% of new student admissions. With the large number of students who excel, state universities need to maintain their achievements by completing their degrees which are also equipped with valuable experience and skills as well as good achievements in the aca-

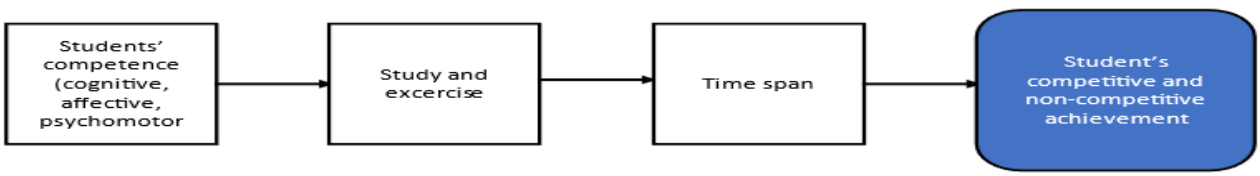

Figure 1. Students' Achievement Model

demic and non-academic fields (Beattie, Laliberté, & Oreopoulos, 2018). Many studies have shown that new students' admission is one of the factors that influence student achievement (Sulphey, Al-Kahtani, & Syed, 2018; Hossler, et.a;, 2019; Ferrao & Almeida, 2019; Hakkinen, 2004), so it is necessary to conduct a more comprehensive study of the relationship between the new student admission system and student achievement.

Achievement motivation is defined as the drive to achieve something above other individuals (Brunstein & Heckhausen, 2018; Wigfield & Cambria, 2010). In addition, achievement motivation is also defined as the need to strive toward performance standards encountered in various situations, especially in the educational environment (Bakar, et.al, 2010; Suswanto, Astani, & Wibawa, 2017). Motivation is an important aspect of student success in both academic and non-academic fields (Suswanto, Astani, & Wibawa, 2017). When students are motivated to perform academic tasks competently, they will learn according to their abilities. Regarding achievement motivation, it has long been regarded as one of learning to understand students' interest, involvement and persistence in learning activities which in turn determines students' learning and school success (Perry, et.al, 1993). For almost all educational psychologists, the essence of teaching and learning (Yazsani & Sane Godbole, 2014; Yusuf, 2011).

A reward system for students which includes recognition of student achievements and incentives for outstanding students. Recognition of student achievement can be in the form of acknowledging student non-academic achievements as achievements from academic activities. Awards can also be in the form of incentives (Angrist & Oreopoulos, 2009; Wilson & Corpus, 2001; Chao, et.al, 2017). Incentives can foster students' intrinsic motivation to excel. However, other researchers stated that incentives have a negative effect on medical student achievement (Apriana, 2020). Apart from incentives, there are other awards that need to be given to outstanding students. Awards have an influence on student motivation and achievement (Baranek, 1996).

Higher education institutions provide student services. Services are given to the college students in various form, such as fostering student talents and interests, academic guidance, libraries, worship facilities, sports facilities, student welfare and health, and so on. In addition, services to students can also be in the form of additional guidance, counseling, stress management workshops, time management assistance, and resources (Lee, at.al, 2009; Cox & Strange, 2010; Sumarsono, Maisyaroh, & Kusumaningrum, 2021; Quinn, et.al, 2009; Griadhi, et.al, 2018).

Based on the literature review, the model of variables relation is shown in chart 1. By examining, and considering the literature reviewed above, in general, this study is aimed to provide a comprehensive understanding of the relationship between each dimension of new students' admission, students' achievement motivation, students' services, reward system, and students' achievement. Moreover, the specific purposes of this study are:

1. Obtain a model that is in accordance with empirical data about the relationship between selection of new student admissions, achievement motivation, service to students, student achievement award system, and student achievement at PTNBH.
2. Knowing the direct relationship, indirect relationship, and simultaneous relationship between the selection of new student admissions, achievement motivation, service to students, student achievement, reward system, and student achievement at PTNBH.

Materials and Method

Research Design

Based on the nature and problems studied, the researcher used a non-experimental quantitative approach. Quantitative research is used to find cause and effect or relationships between variables, mostly to verify/cancel theories or hypotheses (Creswell, 2002; Teddlie & Tashakkori, 2009; Feilzer, 2009) as Creswell also emphasized, namely: "Quantitative research is an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures" (Creswell, 2014).

In accordance with the objectives to be achieved in this study, namely to determine the relationship of one variable with another variable, the type of research used is correlational research. Correlational research is a type of non-experimental research where the researcher uses data derived from pre-existing variables, and there is no manipulation of variables in this type

of research. Correlational research intends to see the relationship between variables. The relationship between variables is primarily based on literature studies, but it can also be based on intuition or thinking according to the experience situation in the field. In general, the relationship between variables is divided into three: (1) a symmetrical relationship, namely a relationship without causality (2) an asymmetrical relationship, namely one-way causality which is termed "influence" (3) a reciprocal relationship, namely a two-way causality which is termed "mutual influence" (Solimun, et al., 2017).

Sample

The population of this study includes Brawijaya University (UB) students who have competitive and non-competitive student achievements reported in SIMKATMAWA 2022. In order to get the sample, this study used Isaac and Michel's formula for an error level of 5% (Sugiyono, 2010). There are 257 students of UB who reported having both academic and non -academic achievements. Their achievement can be classified into (1) non-competition achievement, (2) competition achievement, and (3) achievement from Education and Culture Ministry. The number of samples in this research was 78 students.

Research Instruments and Procedures

The instruments that were developed in this study include questioner students' admission to get information on students' admission pathways taken by students as a sample of this study. Other questionnaires were used to measure variables of students' services, students' achievement motivation, and reward systems. In addition, students' achievement was developed based on students' data reported in SIMKATMAWA.

Good instruments must be valid and reliable. Analysis of data from the results of empirical/field validity tests using Pearson correlation statistics with the help of SPSS, to find out the relationship between each item score and the total score in the questionnaire, with the criteria that the item is declared valid if the significance value is <0.05, otherwise, if the significance value is > 0.05 or the calculated r-value is negative, then the question item is declared invalid. Instrument reliability uses the Cronbach Alpha formula to calculate the reliability of the questionnaire. The assessment of the instrument uses an internal consistency approach with reliability criteria according to Sugiyono (2010) and Suharsimi (2008) that the instrument is declared reliable if the reliability coefficient is at least 0.6. the result of the instrument analysis can be seen in Table 1.

Table 1 shows that a coefficient of r> 0.3, and significance for each item was obtained. Hence, it can be said that the instrument provided good item validity. Meanwhile, the result of Cronbach's Alpha reliability analysis showed that the instruments had greater than 0.7, and 0.55

After the instrument meets the valid and reliable requirements, the instrument is used to collect data. The stages of data collection are as follows: (a) Coordinating with faculty leaders, especially Vice Dean III at the Faculty of Agricultural Technology, the Faculty of Computer Science regarding licensing, (b) coordinating with Vice Dean III staff, (c) Coordinating with students as respondents and filling out informed consent (approval as a respondent), (d) Arranging a schedule data collection, (e) Distributing questionnaires to respondents, (f) Re-collecting questionnaires from respondents, and (g) Processing data.

Data Analysis

Data analysis is the process of logically and methodologically applying statistical methods (through examining and clarifying data) to describe, explain, recap, and evaluate data so that it can be used to draw conclusions. One of the important factors in data analysis is describing data using descriptive statistics so that it makes it easier to process data to be simpler and easier to understand. Descriptive statistics are related to the presentation of numerical data such as the average value, minimum value, maximum value, and standard deviation in the form of tables or graphs. Structural equation modeling (SEM) was chosen as an analytical technique in this study for 3 reasons, namely: researchers used many factors or variables, instruments were made to facilitate interval scales, and SEM consisted of 2 models, namely: a measurement model and a structural model (Hair, et al., 2006; Hair, et al., 1995). Several steps in the analysis of the SEM model are described as follows (Hair, et al., 1998; Tabachnick & Fidell, 2013; Hair, et al., 2014).

Results and Discussion

Out of 78 student respondents, the frequency of the male students was 30 students (38.46%), and female students were 48 students

Table 1. Results of Validity and reliability analysis of the instruments

No	Variables	Items	Item-total analysis	Reliability Coefficient
1	New Students' Admission (NSA)	X_1	r_{1t} = 0.601*	r_{ii} = 0.636
		X_2	r_{2t} = 0.407*	
		X_3	r_{3t} = 0.301*	
2	Students' Achievement Motivation (SAM)	X_1	r_{1t} = 0.307*	r_{ii} = 0.753
		X_2	r_{2t} = 0.427*	
		X_3	r_{3t} = 0.301*	
		X_4	r_{4t} = 0.451*	
		X_5	r_{5t} = 0.493*	
		X_6	r_{6t} = 0.472*	
		X_7	r_{7t} = 0.517*	
		X_8	r_{8t} = 0.561*	
		X_9	r_{9t} = 0.553*	
		X_{10}	r_{10t} = 0.556*	
		X_{11}	r_{11t} = 0.302*	
		X_{12}	$r_{12}t$ = 0.371*	
		X_{13}	r_{13t} = 0.641*	
		X_{14}	r_{14t} = 0.647*	
		X_{15}	r_{15t} = 0.701*	
		X_{16}	r_{16t} = 0.601*	
		X_{17}	r_{17t} = 0.407*	
		X_{18}	r_{18t} = 0.301*	
		X_{19}	r_{19t} = 0.601*	
		X_{20}	r_{20t} = 0.407*	
		X_{21}	r_{21t} = 0.239*	
		X_{22}	r_{22t} = 0.601*	
		X_{23}	r_{23t} = 0.407*	
		X_{24}	r_{24t} = 0.472*	
		X_{25}	r_{25t} = 0.718*	
		X_{26}	r_{26t} = 0.300*	
		X_{27}	r_{27t} = 0.312*	
		X_{28}	r_{28t} = 0.612*	
		X_{29}	r_{29t} = 0.457*	
		X_{30}	r_{30t} = 0.621*	
		X_{31}	r_{31t} = 0.716*	
		X_{32}	r_{32t} = 0.612*	
		X_{33}	r_{33t} = 0.407*	
		X_{34}	r_{34t} = 0.541*	
		X_{35}	r_{35t} = 0.312*	
		X_{36}	r_{36t} = 0.452*	
		X_{37}	r_{37t} = 0.446*	
		X_{38}	r_{38t} = 0.621*	
		X_{39}	r_{39t} = 0.647*	
		X_{40}	r_{40t} = 0.701*	
		X_{41}	r_{41t} = 0.731*	
		X_{42}	r_{42t} = 0.681*	
		X_{43}	r_{43t} = 0.457*	
		X_{44}	r_{44t} = 0.531*	
		X_{45}	r_{45t} = 0.701*	
		X_{46}	r_{46t} = 0.487*	
		X_{47}	r_{47t} = 0.341*	
		X_{48}	r_{48t} = 0.536*	
3	Students' Services (SS)	X_1	r_{1t} = 0.784*	r_{ii} = 0.869
		X_2	r_{2t} = 0.720*	
		X_3	r_{3t} = 0.551*	
		X_4	r_{4t} = 0.781*	
		X_5	r_{5t} = 0.797*	
		X_6	r_{6t} = 0.761*	
		X_7	r_{7t} = 0.681*	
		X_8	r_{8t} = 0.707*	
		X_9	r_{9t} = 0.781*	
		X_{10}	r_{10t} = 0.601*	
		X_{11}	r_{11t} = 0.707*	
		X_{12}	$r_{12}t$ = 0.791*	
4	Reward System (RS)	X_1	r_{1t} = 0.604*	r_{ii} = 0.689
		X_2	r_{2t} = 0.637*	
		X_3	r_{3t} = 0.801*	
		X_4	r_{4t} = 0.601*	
		X_5	r_{5t} = 0.607 *	
		X_6	r_{6t} = 0.601*	
		X_7	r_{7t} = 0.542 *	
5	Students' Achievement (SA)	Y_1	r_{1t} = 0.701*	r_{ii} = 0.705
		Y_2	r_{2t} = 0.625*	
		Y_3	r_{3t} = 0.799*	

(51.54%). Regarding the frequency of new students' admission descriptive data, the number of students who registered by using students' achievement evaluation was 30 students (38.46%), SBMPTN was 34 students (43.59%), and independent selection was 14 students (17.95%). Meanwhile, according to the achievement, the descriptive data about the students' achievement i.e. (1) non-competition achievement was 28 students (35.89%), (2) competition achievement was 35 students (44.87%), and (3) achievement from Education and Culture Ministry was 15 students (19.24%).

Based on Table 2, it can be underlined that there is no significant positive relationship between new students' admission, Students' motivation achievement. On the other side, there is a significant positive relationship between new students' admission with student achievement. The students who registered by using the student's achievement evaluation perform higher achievement. It was also supported by the descriptive data that there were 38 students, and they had higher achievement. In addition, students had higher achievement motivation. It can be said that students' admission pathways influence students' achievement.

The result second analysis showed that there is a significant positive between students' service and students' achievement. It means that if the university provides better students' service it will improve the number of students' achieve-

Table 2. Coefficient of Relationships between variables.

Exogenous variable	Endogenous variable	*r*	*p*	Information
NSA	SAM	-0.082	0.14	Not significant
	SA	0.186	0.012*	significant
SS	SAM	-0.094	0.130	Not significant
	SA	0.189	0.013*	significant
RS	SAM	0.102	0.015*	significant
	SA	0.179	0.011*	Significant
SAM	SA	0.184	0.010*	Significant

Table 3. Recommendation for Model Evaluation

Fit Measure	Good Fit	Acceptable Fit	Proposed Model
X2/df	$.0 \leq \chi 2/df \leq 2$	$2 \leq \chi 2/df \leq 3$	.0
RMSEA	$0 \leq RMSEA \leq .05$	$0 \leq RMSEA \leq .08$	.30
NFI	$.95 \leq NFI \leq 1.00$	$.90 \leq NFI \leq .95$	.1
CFI	$.97 \leq CFI \leq 1.00$	$.95 \leq CFI \leq .97$	.1
GFI	$.95 \leq GFI \leq 1.00$	$.90 \leq AGFI \leq .95$	.1
AGFI	$.90 \leq AGFI \leq 1.00$	$.85 \leq AGFI \leq .90$	.94
RMSEA = Root Mean Square Error of Approximation, NFI = Normed Fit Index, CFI = Comparative Fit Index, GFI = Goodness-of-Fit Index, AGFI = Adjusted Goodnessof-Fit-Index (Schermelleh-Engel et al., 2003).			

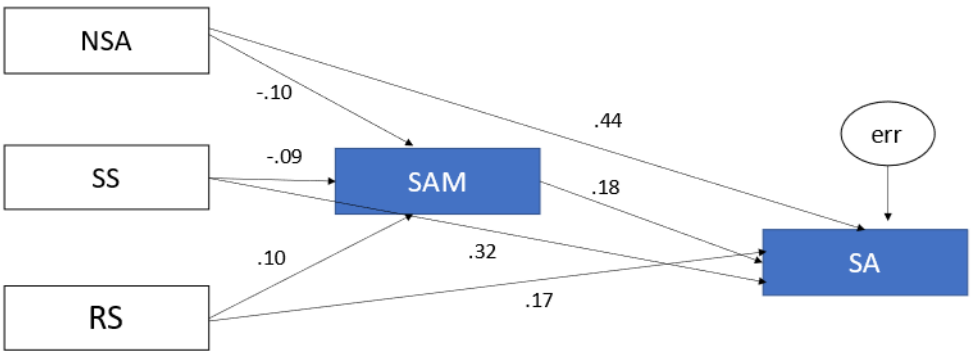

Figure 2. Value of the proposed model

ments. The students' service for higher education involves services on critical thinking, students' talent and interest, highly qualified lecturers who guide and develop students' critical thinking, talent and interest, and so forth. On the other hand, students' service did not have a significant positive relationship with students' achievement motivation. It is relevant to the indicator that builds students' achievement motivation. Students who have high achievement motivation tend to have high self-directed learning, so they can automatically learn and achieve what they perceive as valuable for them.

The third research result shows that there is a significant positive relationship between the reward system, students' motivation achievement, and students' achievement. Reward system which provides a beneficial impact on students tends to improve student motivation achievement. Finally, as like as the last research result, motivation achievement influences positively to the students' achievement.

In order to evaluate the model, the process used AMOS Program. A reliable method was gathered by determining the values of

some goodness-of-indexes and comparing them with the acceptable values. The values of good fit and acceptable fit along with the values of the proposed model displayed in Table 3.

In the proposed model, the value of chi-square is "0", and should be less than three when divided by the degree of freedom. This shows that the model has a suitable index value regarding the value of chi-square.

The results of the research also demonstrated that the goodness-of-fit indexes of the proposed model were as follows: NFI = .1(.95 ≤ NFI ≤ 1.00); CFI = .1(.97 ≤ CFI ≤ 1.00); GFI = .1(.95 ≤ GFI ≤ 1.00); AGFI = .94 (.90 ≤ AGFI ≤ 1.00). These figures demonstrate that the model's fitness was acceptable. Nevertheless, RMSEA value was found to be .25, which is not within the limits of the recommended value (0 ≤ RMSEA ≤ .05). Thus, after the necessary path analysis, the model was reviewed again and modified. To obtain the suitability of the model as a whole, the two-headed row between students' achievement motivation and students' achievement was omitted and after this adjustment, the model was re-evaluated as in Figure 2.

Conclusion

This study showed a positive relationship between new students' admission, students' service, reward system, and students' achievement. Those variables had a direct relationship. In addition, there was no significant positive relationship between new students' admission for students' achievement motivation, as well as students' service for students' achievement motivation. In sum, this study showed that UB had good students' management. As a result, the students can get achievements.

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