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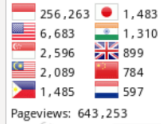
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Enhancing Education Efficiency through Improving Student Retention: A Comparative Study of Engineering and Economics Students in an Indonesian University

Yulianti Talar^{1a}, Jimmy Gozaly^{1b}, Christina Wirawan^{1c♦}, Fiona Aprilia^{2d}

Abstract. *Universities play a vital role in human resource development. However, the dropout rate at many universities remains high which suffers education efficiency and effectiveness. This study examines factors that affect student retention to find a suitable approach. In this article, we examine engineering and economics students to discover if any differences in their traits influence student retention in these two professions. This knowledge sharpens ways to increase student retention rates. The research was conducted quantitatively using a questionnaire. Data were processed by discriminant analysis, crosstabulations, and descriptive statistical methods. The results found that different factors affect engineering and economics students' retention. GPA and student satisfaction with close social relationships with fellow students were shown to be the determining variables for engineering students' retention. Meanwhile, student satisfaction with lecturer feedback on course progress and student confidence to graduate on time are drivers of economics students' retention.*

Keywords: *drop-out, persister, private university, student retention, economics, engineering field*

I. INTRODUCTION

Higher education is a key component of a country's human resource development. Universities primarily contribute to student education by instilling in them the information, skills, and attitudes necessary for success (Van Dinther, Dochy, & Segers, 2011), and holding good values (Cortese, 2003) that will be useful for society. However, currently, in most countries, the drop-out rate for university students is still high. In the USA the drop-out rate reaches 40% (Hanson, 2021), while in the United Kingdom, it reaches 15%, while in the average countries that are members of the Organization for Economic Co-operation and Development (OECD), the

drop-out rate reaches 67% (Erudera College News, 2021). A high dropout rate indicates inefficiency and negatively impacts university success. Individuals, families, and communities have invested significant sacrifices and resources in sending a student to university (Thomas, Kift, & Shah, 2021). However, it is important to ensure the efficiency and effectiveness of these higher education investments (Maldonado, Miranda, Olaya, Vásquez, & Verbeke, 2021). Apart from the problem of financial efficiency, student retention rates also need to be increased because it is related to the role of reducing the pace of human resource development.

Student retention is also a good predictor of the effectiveness of educational institutions in different nations (Manyanga, Sithole, & Hanson, 2017). It is a strategic issue for institutions and various interested parties such as the government and related private parties (Aljohani, 2016). Research on student retention began with a study by Tinto (1975) and after that, many researchers discussed similar topics. Many studies have identified the factors that influence student retention. A sense of belonging was discovered among them (O'Keeffe, 2013; Pedler, Willis, & Nieuwoudt, 2021; Thomas et al., 2021), caring, friendly environment (O'Keeffe, 2013), faculty relations (O'Keeffe, 2013; Seery, Barreda, Hein, &

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Hiller, 2021), support for diversity (O'Keeffe, 2013), student commitment (Nieuwoudt & Pedler, 2021), social support (Nieuwoudt & Pedler, 2021; Seery et al., 2021), professional staff (Roberts, 2018), system availability (Kilburn, Kilburn, & Cates, 2014), support students growth (Thomas et al., 2021), motivation, enjoyment study (Pedler et al., 2021), service quality (Seery et al., 2021; Swani, Wamwara, Goodrich, Schiller, & Dinsmore, 2021), brand reputation (Swani et al., 2021) affects student retention. However, unlike in Europe and America, research on the topic of student retention in Asia is still limited.

This research takes an Indonesian private university as a case. Indonesia is one of Asia's most populous countries. Indonesia's overall population exceeded 272 million in 2021, according to the Indonesian Central Bureau of Statistics. According to the Ministry of Education and Culture's Directorate General of Higher Education, the number of students dropping out and resigning in Indonesia reached 7% in 2020 (Secretariat Directorate General of Higher Education, 2020) and 8% in 2019 (Ministry of Research, Technology, 2019). Despite being far lower than the dropout rate in other countries, this proportion becomes a concern because it is a developing country, which needs rapid human resource development.

Another reason for selecting Indonesia as a case is because in Indonesia private universities are experiencing greater pressure regarding the competition (Asavisanu, 2017; Talar & Gozaly, 2020). Competition occurs with private universities as well as with state universities. Public universities often have superior quality and reputes due to the government's significant support. But, in Indonesia, private institutions significantly outnumber state universities (Secretariat Directorate General of Higher Education, 2020). State universities, private universities, official universities, and foreign universities are 122 (2.66%), 3044 (66.27%), 187 (4.07%), and 1240 (27%) respectively (Secretariat Directorate General of Higher Education, 2020). Meanwhile, the private university drop-out rate is higher (11%) than public universities (3%) (Secretariat Directorate General of Higher

Education, 2020). Then, it is decided that the case under consideration is a private university. Furthermore, in Indonesia, economics students had the highest percentage of dropouts (23.5%), followed by engineering (22.6%) (Secretariat Directorate General of Higher Education, 2020). So, the purpose of this research is to compare and contrast these two fields of science.

For a case, we take an Indonesian private university. This university is in Bandung, the capital of West Java province. In this university, there is a Faculty of Economics and a Faculty of Engineering, so these two fields will be taken for research considering that these two fields have the highest dropout rates in Indonesia. These two fields will also be compared to find out if there are differences in the factors that affect the dropout of students in economics and engineering, who have different knowledge bases. As previously mentioned, several studies have examined student retention. However, few researchers have been looking at student retention in Indonesian private colleges and evaluating the factors that can influence student retention for students studying economics and engineering.

The purpose of this study was to discover if there were any variations in the independent factors that impacted student retention in economics and engineering, as well as to learn about the features of each kind of student retention in the two disciplines. The outcomes of this study will be valuable in designing retention strategies for higher education, which will enhance university efficiency and performance while also advancing human resource development.

As described above, student retention is a concern of educational institutions in various countries. The university strives for students to complete their education (Tight, 2020). As a result, numerous scholars have studied student retention to develop strategies and procedures (Aljohani, 2016).

Some researchers found factors that determine student retention are a sense of belonging (Boyd, Liu, & Horissian, 2020; Pedler et al., 2021), the presence of a supportive, loving,

accepting academic atmosphere (O’Keeffe, 2013), motivation, academic confidence, and enjoyment of the learning (Pedler et al., 2021). Other researchers found that student retention student engagement (Thomas et al., 2021; Tight, 2020), the level of student’s personal and career goals, as well as the availability of social support lead to student retention (Nieuwoudt & Pedler, 2021). In terms of institutions, faculty factors (Gillen-O’Neel, 2019; O’Keeffe, 2013; Seery et al., 2021), reputation, and institutional quality affect student retention (Roberts, 2018; Swani et al., 2021). In addition, some researchers identified several factors that lead to student drop-outs such as lack of family support, financial constraint, poor time management, heavy academic workloads and work commitment (Nieuwoudt & Pedler, 2021), decreased mental health, disability, socioeconomic status, and ethnic minorities (O’Keeffe, 2013).

On the other side, Jensen (2011) describes factors that influence student retention in higher education are Individual Level (academic performance, attitudes, and satisfaction), Institution Level (academic engagement), and Social & External Level (social and family support).

Another study by Atif, Richards, & Bilgin (2013) divides student retention behaviour into six types of students, as follows (Atif et al., 2013):

1. Persisters/retainers/stayers: students continue their education without interruption.
2. Stop-out: students leave their study program for a certain period and return to continue their studies.
3. Transfer: students begin their studies in one program but then transfer to another program.
4. Attainer: students drop out of university, but after reaching a certain goal.
5. Drop-out/leaver: students leave the study program and do not return.
6. Slow-down: students continue their studies but only contract a few courses per semester.

These conditions are consistent with private universities’ conditions in Indonesia. Financial or familial issues are the most common reasons for stopping. Students frequently transfer because they believe they do not fit into the program or

are unable to participate. The attainer arises when students have their own business or a decent job. Dropouts are also common, due to various factors such as financial difficulties, family issues, inability to attend classes, transfer to other colleges, and so on. Students generally experience a slowdown since they have jobs or own businesses.

Based on the suitability of the results of research by Jensen (2011) and Atif et al. (2013), this study used the modification of both research results as shown in Figure 1. Talar & Gozaly (2020) have already used the results of research by Jensen (2011) and Atif et al. (2013). They discovered factors that affect student retention: satisfaction with solid social relationships with peers, student confidence to graduate on time, student confidence to get good employment after college, and average college attendance (Talar & Gozaly, 2020).

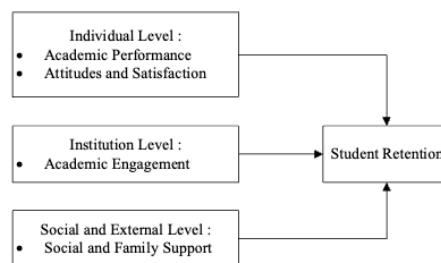


Figure 1. Research model

Although there have been many studies on student retention in universities by researchers from around the 1960s (Tight, 2020) until now, limited research has been done on student retention in Asia, especially in Indonesia. Several studies on student retention in Indonesia have already taken place in the public universities (such as Kusumawati, 2019), private universities (such as Talar & Gozaly, 2020; Trisihnyo & Harun, 2021) and open universities (such as Arifin, 2018; Ratnaningsih, Saefuddin, Kurnia, & Mangku, 2021). No research has been found using a combination of research results by Jensen (2011) and Atif et al. (2013) that would be appropriate for Indonesian higher education conditions. Furthermore, no research has compared

economics and engineering student retention. As such, our study aims to address this gap in the literature and provide new insights into student retention in Indonesian universities.

II. RESEARCH METHOD

This study begins with identifying the research objectives based on the difficulties outlined in the introduction. The next step is to do a literature review, which involves looking at previous research studies. According to the literature review, there have been numerous academics who have undertaken research on student retention for decades in many nations. However, there is still an unaddressed research gap in terms of student retention study in Indonesian private universities as mentioned by Jensen (2011) and Atif et al. (2013), then contrasting the elements that impact economics students' retention with engineering students.

The next step is to determine the variables used. Based on the suitability of the conditions of private universities in Indonesia, to find factors that influence student retention, this study uses a combination of the results of research by Jensen (2011) and Atif et al. (2013). In addition, this research looks at student characteristics to help educational institutions formulate strategies. Gender; class; GPA; parental education level; source of funding; the number of courses taken; percentage of attendance; average lecture-related activities attended; average time spent on independent study; average time spent on group study; and average time spent on student activities; confidence in graduating on time; confidence in graduating with a good GPA; and confidence in having a good career after graduation is amongst the student profiles evaluated. A quantitative method was employed through questionnaires that were used to gather information. Student profiles, measuring student satisfaction and approval for external individual-institutional-social level factors, and selecting the

type of student retention are the three sections of the questionnaire.

The dependent variable was arranged using the variables from Atif et.al (2013). However, we rearranged the categories to create four retention categories based on the output of student retention in universities. The categories of transfer, attainer, and drop-out have been merged into one because the outcomes are the same: students leave their study program or university. The dependent variables can be found in Table 1. The independent variables were deployed into 25 statements based on Jensen's categories, as in Table 2.

The questionnaire included items from Tables 1 and 2 (dependent and independent variables). Students were instructed to choose one statement about the retention category that best suited them as the dependent variable. Students were instructed to choose one of the available answer alternatives for independent variables 1, 2, and 14, while the remainder were filled in using a Likert scale of 1-4. Scale 1 represents the most negative and scale 4 represents the most positive.

Table 1. Statements for Dependent Variables Measurement

No.	Retention Categories	Statement
1	The Persister	I plan to study according to the curriculum set by the study program
2	The Stop-Out	I plan to leave the study program for a certain period and will return to continue my studies (leave) at a later date
3	The Slow-Down	I plan to continue studying but will only contract a few courses per semester
4	The Transfer, Drop-Out, Attainer	I plan to leave the study program for good (move to another study program at the university)

Table 2. The statements used to find factors affecting student retention

No.	Statement	Code
Individual Level: Academic Performance		
1	Grade Point Average (GPA)	GPA
Individual Level: Attitudes and Satisfaction		
2	A percentage of attendance	ATTEND
3	Student confidence to graduate on time	CONF_GRAD_ONTIME
4	Student confidence to graduate with a satisfactory GPA	CONF_GRAD_GOOD_GPA
5	Student confidence to get a good career after graduation	CONF_CAREER
6	Opportunities to interact actively in learning activities	OPP_INTERACT
7	Opportunity to conduct research with lecturers.	OPP_RESEARCH
8	Opportunities to collaborate and share experiences with other students.	OPP_COLL_SHARE
9	Opportunity to discuss with the teacher.	OPP_DISCUSS
10	Feedback is given by the teacher regarding the progress of the course.	FEEDBACK
11	The benefits of the lecture material being taught.	COURSE_BENEFIT
12	The suitability of the value of the courses obtained with the efforts that have been made	SUIT_GRADE_EFFORT
13	Functions of supporting work units on campus (for example student affairs unit, extracurricular, etc.)	SUPPORT_UNIT
Social and External Levels		
14	Parent's education level	PARENT_EDU
15	Family support to complete the study	FAM_SUPPORT
16	Support from lecturers and all study programs staff to complete the study	LECT_STAFF_SUPPORT
17	Close social relations with lecturers and all study program staff	SOCIAL_REL_LLECT_STAFF
18	Close social relations with fellow student	SOCIAL_REL_STUDENTS
19	Social activities with fellow students	SOCIAL_ACT_STUDENTS
20	Comfort in the campus environment	COMFORT_CAMPUS
Institutional Level		
21	I feel proud to be a student at the Faculty of Engineering/Faculty of Economics	PROUD_STUDENTS_DEPT
22	I feel proud to be a student at the university	PROUD_STUDENTS_UNIV
23	A sense of belonging to the campus.	SENSE_BELONG_CAMPUS
24	A sense of belonging to the campus community.	SENSE_INVOLVE_COMMUNITY
25	A sense of being needed by the campus.	SENSE_IMPORTANCE

The questionnaire was created using Google Forms. The questionnaire was administered from October 21, 2020, to November 18, 2020, to students in the field of engineering, and from March 22, 2021, to May 19, 2021, to the field of economics is administered. The respondents were students who have attended lectures for at least 5 semesters with the consideration that these students have experienced various college activities (lectures, practicums, organisational activities, etc.) to ensure they can make good assessments. Samplings were chosen by purposive sampling technique. Three hundred

ninety-three questionnaires were collected, with ninety-six in the field of economics and two hundred ninety-seven in the field of engineering.

The questionnaire's validity and reliability were tested. The correlation was used to conduct the validity test and found two invalid variables in the field of engineering, namely PARENT_EDU and ATTEND. Meanwhile, four invalid variables in the field of economics were eliminated, namely the GPA, PARENT_EDU, ATTEND, and CONF_CAREER. Reliability was tested using Cronbach's Alpha and the results were Cronbach's Alpha values of 0.862 and 0.907 for the field of

engineering and economics respectively. The Cronbach Alpha value indicates that the reliability of the questionnaire is high so that the questionnaire then can be used to carry out research.

Furthermore, data processing is carried out by discriminant analysis to understand group differences and predict the probability of a respondent/an object being suitable in a particular group based on independent variables (Hair, 2008). The classical assumptions of normality, linearity, homoscedasticity, and multicollinearity were tested before the discriminant analysis.

For student data in economics and engineering, each processing step is completed separately. Based on independent variables that significantly affect the type of student retention, the characteristics of each type of student retention from the two disciplines will be investigated. The faculty/university can construct the best strategy for all students to become persistent types by identifying the characteristics of each type of student retention.

III. RESULT AND DISCUSSION

Given the distinct characteristics of the two fields of economics and engineering, which include differences in learning styles and student characteristics, it is highly likely that the independent variables that influence retention in the two disciplines are also distinct. As a result, the data from the two fields were processed separately and compared after the results were determined.

Validity, Reliability, and Classical Assumption Test

Cronbach's Alpha values are 0.862 for fields of engineering and 0.907 for fields of economics, indicating that the reliability of the questionnaire is high, so this questionnaire is appropriate for this study.

Validity and classical assumptions test leaves independent variables that can be further processed, as in Table 3.

Validity testing and classical assumptions are carried out separately for data from the faculties of economics and engineering. Validity testing is done by comparing the Corrected Item-Total Correlation value of each variable with the table r value, if the Corrected Item-Total Correlation value $<$ table r limit value then the variable will be filtered and not processed further. Determination of the limit value of r table depends on the level of confidence and the number of respondents.

Classical assumption tests carried out for Discriminant Analysis processing are:

1. Test of Normality of independent variables using the Kolmogorov Smirnof test, where the normality assumption is fulfilled if the Sig value. $>$ 0.05.
2. Test of Linearity between independent and dependent variables, by paying attention to the Sig. value on Deviation from Linearity. If Sig. $>$ 0.05 then the linearity assumption is met.
3. Homogeneity of Variance Tests independent variables by paying attention to the Sig. value on the Levene Statistic, where the assumption of homogeneity is fulfilled if the Sig value. $>$ 0.05.
4. Multicollinearity checking of independent variables using VIF and Tolerance values on Collinearity Statistics, where the assumption is fulfilled if multicollinearity does not occur, namely when the maximum VIF is 10 and the minimum Tolerance is 0.1.

The result of Faculty of Economics are:

1. With a confidence level of 95% and the number of respondents 140 people obtained a limit value of 0.1658. The result of the validity test is that there are 4 discarded variables, namely the GPA variable, the last education of parents, the % of college attendance, and the belief in getting a good career when graduating from college. After all variables are valid and reliable, classical assumption testing is carried out for the remaining 21 independent variables.
2. The results of classical assumption testing are that all independent variables tested are normal, linear, homogeneous and free of multicollinearity.

The Result of Faculty of Engineering are:

1. With a confidence level of 95% and a total of 297 respondents, a limit value of 0.1138 was obtained. The validity test results show that 2 variables are filtered out, namely the variable of the highest level of parental education (PARENT_EDU) and the variable of the average percentage of college attendance (COLL_ATTEND). The reliability test results show high reliability of 0.862.
2. The results of classical assumption testing filtered out 8 independent variables, namely variables:
 - a. Satisfaction with opportunities to conduct research with lecturers (OPP_RESEARCH)
 - b. Satisfaction with the closeness of social relationships with lecturers and all study programme staff (SOC_REL_LEC_STAFF)
 - c. Satisfaction with social activities with fellow students (SOC_ACT_STUDENTS).
 - d. Satisfaction with opportunities to actively interact in learning activities (OPP_INTERACT).
 - e. Satisfaction with the suitability of the course grade obtained with the effort that has been made (SUIT_GRADE_EFFORT)
 - f. Satisfaction with comfort in the campus environment (COMFORT_CAMPUS).
 - g. Feeling needed by the campus (SENSE_IMPORTANCE).
 - h. Pride in being a student in the Study Program at Maranatha Christian University (PROUD_STUDENT_DEPT).

Discriminant Analysis

As shown in Table 4, the discriminant analysis results reveal differences in independent variables that affect economics and engineering student retention.

Discriminant Analysis processing consists of 2 stages. In the first stage, independent variables that do not differ between groups of dependent variables are filtered using the Tests of Equality of Group Means table. Independent variables that are processed further in the second stage are independent variables that differ between groups of dependent variables (the four categories of student retention). In the second stage of

Table 3. Independent Variables Which are Further Processed Using Discriminant Analysis

Engineering	Economics
OPP_RESEARCH	ATTEND
SOCIAL_REL_LECT_STAFF	CONF_GRAD_ONTIME
SOCIAL_REL_STUDENTS	OPP_INTERACT
OPP_INTERACT	OPP_RESEARCH
SUIT_GRADE_EFFORT	OPP_COLL_SHARE
COMFORT_CAMPUS	OPP_DISCUSS
PROUD_STUDENTS_UNIV	FEEDBACK
SENSE_IMPORTANCE	COURSE_BENEFIT
	SUIT_GRADE_EFFORT
	SUPPORT_UNIT
	FAM_SUPPORT
	LECT_STAFF_SUPPORT
	PROUD_STUDENTS_DEPT
	SENSE_BELONG_CAMPUS
	SENSE_INVOLVE_COMM
	UNITY
	SENSE_IMPORTANCE

Table 4. Independent Variables That Have a Significant Influence on Student Retention

<i>Independent Variables That Have a Significant Influence on Student Retention</i>	
<i>Field of Economics Students</i>	<i>Field of Engineering Students</i>
1. Student confidence to graduate on time (CONF_GRAD_ONTIME)	1. GPA (GPA)
2. Satisfaction with the feedback provided by the teacher regarding course progress (FEEDBACK)	2. Satisfaction with close social relations with fellow students (SOCIAL_REL_STUDENTS)

Discriminant Analysis processing, independent variables that significantly affect student retention will appear in the Standardised Canonical Discriminant Function Coefficients table, and other independent variables that do not significantly affect will not appear in this table.

The independent variables that affect economics student retention are Student confidence to graduate on time (CONF_GRAD_ONTIME) and Satisfaction with the feedback provided by the teacher regarding course progress (FEEDBACK), while the

independent variables that affect engineering student retention are GPA and Satisfaction with close social relations with fellow students.

CONF_GRAD_ONTIME and FEEDBACK were found as factors that influence economics student retention. The reasoning behind the first finding is that most economics students in Indonesia study for a shorter period than engineering students. Then, economics students should have confidence in their ability to complete their education on time or ahead of schedule. Students are more likely to stay motivated if they believe they can finish their studies on time. This finding is in line with previous research, which identifies a time limit determined by students to spend in the university (Mollner, 2021).

The finding of the second factor is that most economics courses are related to the notion of theory rather than calculations. Therefore, the correct answer is not definite but normative, depending on the rationale, context, and assumptions. Thus, students need to get feedback from lecturers. Furthermore, students feel cared for and confident that they are on track in terms of study time when they receive feedback on their study progress. This finding was written by previous researchers, such as Mollner (2021), Nieuwoudt & Pedler (2021), and Tight (2020) who wrote that assessment and feedback to students affect student retention.

When compared to economics students, engineering students' GPAs, and SOCIAL_REL_STUDENTS have a stronger influence on their academic success. With the numerous practicums and fieldwork practices that take more time and effort, engineering students tend to study for longer periods. As a result, GPA is more important to them. They were more motivated to finish their education if their GPA was good. This is in line with the research results by Choudhury & Runco (2020) that engineering students' GPA determines retention, and the retention rate will be higher when the GPA is higher. Another aspect is student happiness with intimate social relationships. Group assignments and projects in the engineering field promote collaborative skills and require more understanding, logic, and calculations. Consequently, engineering students

mostly engage in group studies, which necessitate good relationships with their friends. This finding strengthens the findings of Chrysikos & Catterall (2020), Mollner (2021), and Nieuwoudt & Pedler (2021) who also found that there was a relationship between good relationship between students and student retention.

Characteristics of Each Type of Student Retention

Figures 2 and 3 show the squares that represent the group-centroid values for the four types of student retention based on the discriminant function generated by the discriminant analysis, namely from the economics and engineering fields.

In Figure 2, only three squares exist, namely types 1 (persister), 2 (stop-out), and 3 (slow-down). No student selected the fourth retention

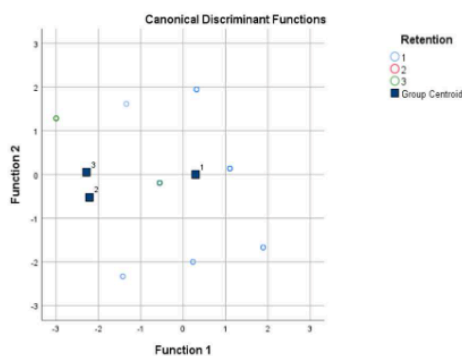


Figure 2. Group Centroid for Economics Fields

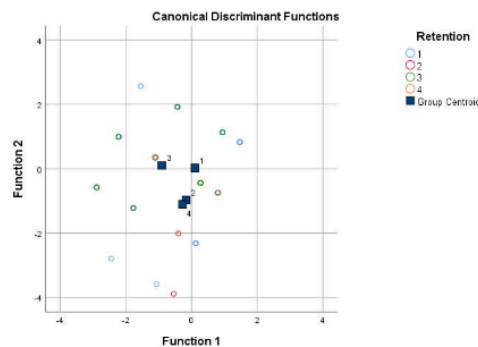


Figure 3. Group Centroid for Engineering Field

type, so it was not included in the graph. This is because it is rare for students from the Faculty of Economics to transfer to another study program, as they may find it difficult to adapt and follow lectures. The three types discovered were persister at 88.54%, stop-out at 1.04%, and slow-down at 10.42%. The group-centroid image for economics below shows a close distance between centroids 2 and 3, which means that the characteristics of students type 2 and type 3 are similar.

The four boxes in Figure 3 show that engineering data represent all types of student retention, namely persister 87.21%, stop-out 1.68%, slow-down 9.76%, and combined drop-out, transfer, and attainer 1.35%. Figure 3 shows that the centroids for types 2 and 4 are close

together. This means that students from the two retention types have similar characteristics.

Table 4 shows differences found in independent variables that significantly affect student retention between the two fields. In addition, Figures 2 and 3 show that the characteristics of each type of student retention in economics and engineering are also different. To further analyze the characteristics of each type of student retention from the two disciplines, Figures 4 and 5 show the value of the independent variable for each type of student retention.

Figure 4 shows the average value of FEEDBACK and CONF_GRAD_ONTIME which has a significant effect on economics student retention. The characteristics of each type of student

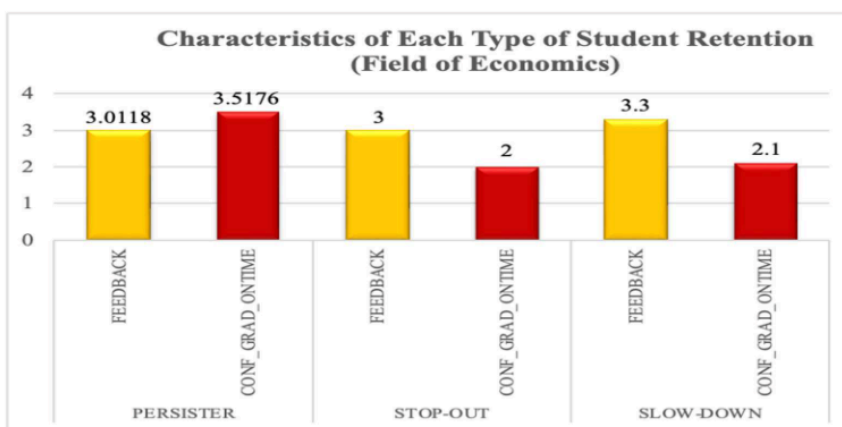


Figure 4. Characteristics of Each Type of Student Retention for the Economics Field

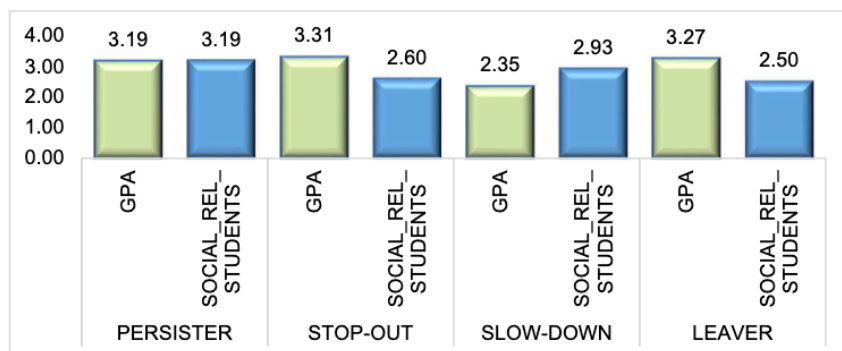


Figure 5. Characteristics of Each Category of Student Retention in the Field of Engineering

retention are:

- Persister has a high satisfaction score for FEEDBACK and CONF_GRAD_ONTIME (above 3, on a scale of 1-4).
- There are similarities in the characteristics of stop-out and slow-down type students, both have high satisfaction scores for FEEDBACK and low scores for CONF_GRAD_ONTIME.
- The main difference between the persister compared to stop-out and slow-down is that persister has a very high score for CONF_GRAD_ONTIME, while stop-out and slow-down scores are very low.

With this result, the economics faculty leaders must strive to increase student confidence to graduate on time so that students continue to study according to the curriculum (persister) to increase student retention.

Figure 5 depicts the average GPA and SOCIAL_REL_STUDENTS, both of which have a major impact on student retention in the engineering field.

- Persister has a balanced GPA and SOCIAL_REL_STUDENTS with a score above 3, meaning that Persister has a high GPA and a high score on SOCIAL_REL_STUDENTS.
- Stop-outs and leavers are students with good GPAs but low scores on SOCIAL_REL_STUDENTS. Leaver has the lowest score on SOCIAL_REL_STUDENTS. Stop-outs and leavers can attend lectures but are not satisfied with their SOCIAL_REL_STUDENTS, so they are not motivated to continue their studies.
- Slow down are students who are not able to attend lectures properly, as indicated by a low GPA but have a high score on SOCIAL_REL_STUDENTS. Slow-down will continue to study but because their GPA is low, the number of courses contracted per semester will be less.

Engineering faculty leaders are advised to seek a balance between the two independent variables above, with a value above 3 so that students continue to study according to the curriculum (persister).

Comparison between Student Retention in Economics and Engineering

To increase the CONF_GRAD_ONTIME variable, the economics faculty can do the following:

- Planning a preparation program and tutorial system for students, for academic and non-academic materials, considering the different abilities and backgrounds of students. For courses that are considered difficult but form the basis for many other courses, academic preparation can be done before the lecture begins.
- Preparation for students is also needed for non-academic materials such as training on teamwork and time management.
- To run the preparation program more effectively, assistance from fellow students or senior students as teaching assistants or tutors can be considered. It is hoped that teaching assistants or tutors from fellow students will increase students' motivation to take part in the preparation.
- The academic advisor helps students to make study plans from the beginning of admission to graduation and enables the academic advisor to monitor the progress of student studies so that it remains according to the plan.
- Enabling academic advisors to provide counselling for their students when needed. A mentoring system conducted by senior students under the supervision of academic advisors also can be set up so that students are more comfortable being counselled. Thus, students can solve their non-academic problems.
- Creating a tutorial system for courses that usually have a low level of course pass. Tutorials can be held by senior students who are prepared by the faculty/study program and are carried out periodically, especially before the exam.

To increase the level of FEEDBACK, the faculty or university can do the following:

- Carry out training on providing appropriate feedback for students.
- Creating a system for providing feedback to students, for example, whenever it is necessary to provide feedback, how often, in any case. The system can be made so that lecturers receive reminders and guidelines for providing

feedback. To remind and guide lecturers to provide appropriate feedback for students, request for students to respond to feedback and link to the role of the academic advisor.

- The feedback system also needs to be equipped with a request for students to respond to feedback so that it can be ensured that the feedback has been received and read by students.
- The feedback system can also be linked to the role of the academic advisor who also monitors the progress of the study and also monitors the feedback from each lecturer as well as from the academic advisor.

For engineering students, the variables that have a significant effect on student retention are the GPA variable and the satisfaction with close social relations with fellow students variables originating from the Individual Level and Social & External Levels. The characteristics of each retention type engineering student indicate that for an engineering student to have a persister type, the value of the two variables must be high and balanced.

To increase the GPA of engineering students, faculties can do:

- Designing tutorial programs for certain courses that usually have a high failure percentage. Tutorials can increase student confidence and increase student grades (Nicholson, Putwain, Connors, & Hornby-Atkinson, 2013). Tutorial programs may involve lecturers or competent senior students under the supervision of the lecturers. Tutorial programs with senior students can be more effective because students usually feel comfortable discussing as well and the way senior students are delivered is easier for junior students to understand because they are still in the same age range.
- Motivate students to read and study on their own apart from being explained by the lecturer. Students can be given materials, questions, and cases for independent study, which will then be discussed together with the lecturer.
- To improve GPA, faculties can also monitor student study results periodically through academic advisors so that student achievement

is monitored, and action can be taken if something is not appropriate.

- Students who have confidence in their grades, lectures, and attendance, will get higher grades at the end of the semester, compared to students who have low self-confidence (Nicholson et al., 2013). A good academic advising method is needed to increase students' self-confidence, which can help students increase their self-confidence in their grades, lectures, and attendance and help solve non-academic problems for students to get higher grades (Nicholson et al., 2013).
- Encouraging lecturers to find and apply various forms of teaching that are suitable for the lecture material provided, for example by giving assignments to work on questions, analyzing real conditions, making reports or presentations, hands-on practice, oral or written questions, and answering, etc. With appropriate forms of teaching and learning methods that encourage student participation, it is expected that students will understand the course material better.

To encourage SOCIAL_REL_STUDENTS, the faculty of engineering can attempt to:

- Conduct student orientation programs to allow new students to get to know each other. Then, students can build relationships with friends early.
- Designing assignments, projects, or group work encourages students to interact with each other, and eventually, they will become close friends while also providing benefits for students because it improves teamwork and leadership skills.
- Encouraging students to take part in extra-curricular activities on campus and to participate in student activities such as sports, arts, science, and other activities at the level of the study program, faculty, or university. By participating in student activities, students can socialize with many more friends, gain organizational experience, and increase their skills.
- Encourage students to take part in extra-curricular activities on campus, to build social relationships with fellow students who have the same interests.

In proportion to the degree of disparities in the knowledge studied in economics and engineering fields, the variables affecting student retention in the two fields differ, as previously mentioned. The FEEDBACK and CONF_GRAD_ONTIME significantly affect student retention for economics students. Economics students need to have great confidence in their ability to graduate on time, according to the features of each type of student retention.

IV. CONCLUSION

This study adds to the growing body of knowledge about student retention in Indonesian private universities. The findings show that in the domains of economics and engineering, there are disparities in independent factors that influence student retention. This demonstrates that variances in features exist among economics and engineering students in nature, which may be produced because of differences in nature and interests among students, or as a result of learning styles and methods.

Every university expects most students to be the ideal type of retention, namely persisters. For this reason, every faculty leader must focus on the factors that affect retention and the characteristics of each type of retention. These two things are different for economics and engineering students, so the tasks that must be completed by the faculties are also different.

Even though this study only uses data from a private university in Indonesia and compares two fields of disciplines, it provides useful information for future research. To strengthen the findings of this study, namely the differences in factors that affect student retention between disciplines, more research can be conducted at various private universities and compared to other fields of disciplines. Other research can be done to compare and contrast the student retention rates of private and public universities. It is also possible to improve the abstraction of research results in countries other than Indonesia.

REFERENCES

Aljohani, O. (2016). A comprehensive review of the

- major studies and theoretical models of student retention in higher education. *Higher Education Studies*, 6(2), 1–18. <https://doi.org/10.5539/hes.v6n2p1>
- Arifin, M. H. (2018). The role of student support services in enhancing student persistence in the Open University Context: Lesson from Indonesia Open University. *Turkish Online Journal of Distance Education*, 19(3), 156–168. <https://doi.org/10.17718/tojde.445116>
- Asavisanu, P. (2017). Utilizing the 4 P s framework for student retention in Thai private universities. *Seventh Intl. Conf. On Advances In Economics, Social Science and Human Behaviour Study - ESSHBS 2017*, 5–9. <https://doi.org/10.15224/978-1-63248-137-5-29>
- Atif, A., Richards, D., & Bilgin, A. (2013). A student retention model: Empirical, theoretical and pragmatic considerations. *24th Australasian Conference on Information Systems*, (December), 4–6.
- Boyd, N. M., Liu, X., & Horissian, K. (2020). Impact of Community Experiences on Student Retention Perceptions and Satisfaction in Higher Education. *Journal of College Student Retention: Research, Theory and Practice*, 0(0), 1–29. <https://doi.org/10.1177/1521025120916433>
- Chrysikos, A., & Catterall, S. (2020). Identifying student retention factors of a UK university using the concept of a learning community: a qualitative approach. *Higher Education Pedagogies*, 5(1), 90–109. <https://doi.org/10.1080/23752696.2020.1788968>
- Cortese, A. D. (2003). The critical role of higher education in creating a sustainable future. *Planning for Higher Education*, 31(3), 15–22. Retrieved from <http://www.scup.org/asset/48483/cortese.pdf>
- Erudera College News. (2021). UK Has the Lowest University Drop. Retrieved May 3, 2022, from Erudera College News website: <https://collegenews.org/uk-has-the-lowest-university-drop-out-rates-compared-of-any-oecd-country-report-shows/>
- Gillen-O'Neel, C. (2019). Sense of belonging and student engagement: A daily study of first- and continuing-generation college students. *Research in Higher Education*, 62, 45–71. <https://doi.org/10.1007/s11162-019-09570-y>
- Hanson, M. (2021). College Dropout Rates. Retrieved May 3, 2022, from EducationData.org website: <https://educationdata.org/college-dropout-rates>
- Jensen, U. (2011). Factors influencing student retention in higher education. *Research & Evaluation*, 4.

- Kilburn, A., Kilburn, B., & Cates, T. (2014). Drivers of Student Retention: System Availability, Privacy, Value and Loyalty in Online Higher Education. *Academy of Educational Leadership Journal*, 18(4), 1–14. Retrieved from <http://ezproxy.snhu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&AuthType=cookie,ip,url,cpid&custid=shapiro&db=eft&AN=100277023&site=ehost-live>
- Kusumawati, A. (2019). Impact of Digital Marketing on Student Decision-Making Process of Higher Education Institution: A Case of Indonesia. *Journal of E-Learning and Higher Education*, 267057. <https://doi.org/10.5171/2019.267057>
- Maldonado, S., Miranda, J., Olaya, D., Vásquez, J., & Verbeke, W. (2021). Redefining profit metrics for boosting student retention in higher education. *Decision Support Systems*, 143, 113493. <https://doi.org/10.1016/j.dss.2021.113493>
- Manyanga, F., Sithole, A., & Hanson, S. M. (2017). Comparison of Student Retention Models in Undergraduate Education From the Past Eight Decades. *Journal of Applied Learning in Higher Education*, 7, 29–41.
- Ministry of Research, Technology, and H. E. (2019). *Statistik Pendidikan Tinggi (Higher Education Statistics) 2019*. Retrieved from http://www.mohe.gov.my/web_statistik/
- Mollner, J. (2021). Student perceptions of advising for retention at a Midwestern Technical College (Winona State University). Retrieved from <https://openriver.winona.edu/educationedddissertations/5>
- Nicholson, L., Putwain, D., Connors, L., & Hornby-Atkinson, P. (2013). The key to successful achievement as an undergraduate student: Confidence and realistic expectations? *Studies in Higher Education*, 38(2), 285–298. <https://doi.org/10.1080/03075079.2011.585710>
- Nieuwoudt, J. E., & Pedler, M. L. (2021). Student Retention in Higher Education: Why Students Choose to Remain at University. *Journal of College Student Retention: Research, Theory and Practice*, 0(0), 1–24. <https://doi.org/10.1177/1521025120985228>
- O’Keeffe, P. (2013). A Sense of Belonging: Improving Student Retention. *College Student Journal*, 47(4), 605–613.
- Pedler, M. L., Willis, R., & Nieuwoudt, J. E. (2021). A sense of belonging at university: student retention, motivation and enjoyment. *Journal of Further and Higher Education*, 1–12. <https://doi.org/10.1080/0309877X.2021.1955844>
- Ratnaningsih, D. J., Saefuddin, A., Kurnia, A., & Mangku, I. W. (2021). Stratified-extended cox with frailty model for non-proportional hazard: A statistical approach to student retention data from universitas terbuka in Indonesia. *Thailand Statistician*, 19(1), 208–227.
- Roberts, J. (2018). Professional staff contributions to student retention and success in higher education. *Journal of Higher Education Policy and Management*, 40(2), 140–153. <https://doi.org/10.1080/1360080X.2018.1428409>
- Secretariat Directorate General of Higher Education. (2020). *Higher Education Statistics 2020 (Statistik Pendidikan Tinggi 2020)*. Retrieved from <https://pddikti.kemdikbud.go.id/publikasi>
- Seery, K., Barreda, A., Hein, S., & Hiller, J. (2021). Retention strategies for online students: A systematic literature review. *Journal of Global Education and Research*, 5(1), 72–84. <https://doi.org/10.5038/2577-509x.5.1.1105>
- Sembiring, M. G. (2014). Modelling the determinants of student retention in distance education institutions. *International Journal of Continuing Education & Lifelong Learning*, 6(2), 15–28. Retrieved from <http://ezproxy.staffs.ac.uk/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eht&AN=96279435&site=ehost-live>
- Setiawan, R., Aprilia, A., & Magdalena, N. (2020). Analysis of antecedent factors in academic achievement and student retention. *Asian Association of Open Universities Journal*, 15(1), 37–47. <https://doi.org/10.1108/aaouj-09-2019-0043>
- Swani, K., Wamwara, W., Goodrich, K., Schiller, S., & Dinsmore, J. (2021). Understanding business student retention during COVID-19: Roles of service quality, college brand, and academic satisfaction, and stress. *Service Marketing Quarterly*, 1–24. Retrieved from doi: 10.1080/15332969.2021.1993559
- Talar, Y., & Gozaly, J. (2020). Student retention in Indonesian private university. *International Journal of Evaluation and Research in Education*, 9(3), 486–493.
- Thomas, L., Kift, S., & Shah, M. (2021). Student Retention and Success in Higher Education. In *Student Retention and Success in Higher Education: Institutional Change for 21st Century* (pp. 1–16). https://doi.org/10.1007/978-3-030-80045-1_1
- Tight, M. (2020). Student retention and engagement in higher education. *Journal of Further and Higher Education*, 44(5), 689–704.
- Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of*

Educational Research, 45(1), 89–125.

Trisihnyo, A., & Harun, A. (2021). Service quality, university image, student satisfaction and student retention: Issues and challenges met by private universities in Indonesia. *Review of International Geographical Education*, 11(10), 320–325. <https://doi.org/10.48047/rigeo.11.10.XXXX>

Van Dinther, M., Dochy, F., & Segers, M. (2011). Factors affecting students' self-efficacy in higher education. *Educational Research Review*, 6(2), 95–108. <https://doi.org/10.1016/j.edurev.2010.10.003>

