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Original research

Enhancing engineering student retention at Indonesian private university through improved interpersonal interactions and social integration

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ABSTRACT

The high number of students dropping out of engineering faculties in Indonesia, especially at private universities, is the background for this research. The variables used in this research are focused on variables related to students' social relationships, namely indicators from the Interpersonal Interaction dimension and the Social Integration dimension, and their influence on students' commitment to completing their studies. Data was collected using a questionnaire distributed to engineering faculty students at a private university in Indonesia as a case study, namely to students who had studied for 1 semester, and a total of 101 people were collected. Data processing using Binary logistic regression shows that the variables that significantly influence student commitment are CSIMILAR (many students, the orientation of new students at the study program level, etc.), where these two variables have a positive effect on students' commitment to completing their studies. The results of Crosstabulations and Correspondence Analysis processing show the relationship patterns of the CSIMILAR and CORPROG variables with other variables. The proposal given to the engineering faculty and study program leaders to increase students' commitment to completing their studies is the formation of various activity units and the organization of different student activities.

1. Introduction

The progress of a country is greatly influenced by the participation of society, especially the active involvement of its youth through the application and development of various knowledge and skills. That is why, higher education has a great responsibility in preparing youth, as the country's most important asset, in developing the country [1]. Indonesia is a developing country that needs a big role from its youth to be able to become a developed country.

Just like in other countries, Indonesia's development requires a combination of various sciences and skills, and one of the most important sciences is engineering. High school students' interest in continuing their studies at the engineering faculty is quite high, as shown by engineering being in fourth place among the scientific fields chosen by Indonesian high school students to continue their studies. Unfortunately, 18.34% of high school students do not complete their studies and engineering is the third scientific field that has the highest drop-out rate [2]. The highest

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contributor to drop-outs is occupied by private universities, namely 8%, while state universities only account for 2% [2], this happens because many state universities are considered better than private universities in terms of quality of education and acceptance in the industry. Often a new private university is chosen when high school students are not accepted at a public university, and even high school students are willing to re-enroll at their dream public university in the coming year if they are not accepted that year [3]. Engineering faculties at Indonesian private universities face big challenges in ensuring that the engineering students they train can complete their studies.

Talar and Gozaly's (2025) research conducted at engineering faculties at a private university in Indonesia shows that student retention is influenced by student satisfaction with close social relationships with fellow students and GPA [3]. In Talar and Gozaly's research, the student retention category was divided into 4 categories, namely *Persister* (students who will continue their studies according to the curriculum), *Slow-Down* (students who will continue their studies but only take a few courses), *Stop-out* (students who plan to take leave, but will continue their studies again), and *Leavers* (students who will not continue their studies/drop-out). To have students with the *Persister* retention category, a balance is needed between the student's satisfaction score with close social relationships with fellow students and the GPA score, where low satisfaction with social relationships with fellow students will result in the student not continuing their studies (*Leaver*) [3]. The results of Talar and Gozaly's research on engineering faculty students are by Tinto's research, which deeply explores the topic of student retention in higher education, stating that academic and social integration are important factors in student retention [4].

This research continues the research results of Talar and Gozaly (2025) above where this research focuses on the socialization process of private university engineering faculty students, with the main aim being that private university engineering faculty leaders can improve student social relations with fellow students, as an effort to increase student commitment finish college. The conceptual model from Weidman (2006) regarding the Organizational Socialization of Students in Higher Education is used in this research, to observe all student Input-Environment-Socialization Output [5]. In Weidman's model, the Input for higher education is the attributes of prospective students (family background, beliefs and values held, and previous academic preparation). The Environment shows the organizational structure and normative context of higher education institutions that influence students through the socialization process. (interpersonal interaction and social integration) and learning which connect students with the main normative environment in higher education, while Socialization Outcomes are the result of changes (knowledge, skills, and character) that occur in students during college.

In accordance with the research results of Talar and Gozaly (2025), this research is limited to the Environment, namely the socialization process that occurs in the engineering faculty private university environment, including interpersonal interaction and social integration of students and the output is in the form of student commitment to completing their studies. Learning is not discussed in this research because learning discusses the relationship between students and study programs/faculties. Students' commitment to completing college will adapt to the Institutional and Goal Commitment factors from Pascarella and Terenzini [6], which measure students' commitment to graduating from college, confidence in their choices, and others. This Institutional and Goal Commitment factor was adopted because it is very in line with Talar and Gozaly's (2025) previous research, namely increasing student retention, namely graduating from engineering faculty on time, with a good GPA.

Research has been conducted on the influence of student socialization processes on university retention, and has provided mixed results. Research by Rosa and Oliveira (2022) shows that Social Integration has a direct influence on commitment [7]. The socialization process that occurs between students in a learning community has been proven to significantly influence GPA, student retention, and academic performance of first-year students [8]. Socially healthy students (for example active in organizations) have higher GPA scores than students who are not active in organizations [9]. However, research conducted by Ishitani (2016) shows that for first-year students, social integration (student activity in various non-academic clubs on campus) does not significantly influence the student's persistence in the second year, while academic integration (student participation in group work activities, the relationship between students and faculty/study programs/lecturers) has a significant influence [10]. Various factors can encourage student social integration, namely through interactions between faculty and students, interactions with peers, extracurricular activities, campus life, and social networking sites [11].

Although there is quite a lot of previous research on the influence of the student socialization process on retention, no one has researched the influence of the student socialization process on the commitment of engineering faculty students in Indonesia, specifically for private universities which of course have different characteristics from public universities.

This research is needed to help leaders of engineering faculties in private universities in Indonesia to increase their students' commitment to graduating on time with good GPAs, increase the sustainability of engineering faculties in private universities, and ultimately help educate young people in developing Indonesia.

2. Material and method

2.1. Research Model

The model used in this research can be seen in Figure 1 below. This research continues the research results of Talar & Gozaly (2025) that the retention of private university engineering faculty students in Indonesia is influenced by student satisfaction with close social relationships with fellow students and GPA [3], so this research is limited to only discussing the influence of variables from the Interpersonal Interaction dimension and the Social Integration dimension towards the Commitment dimension of private university engineering faculty students.

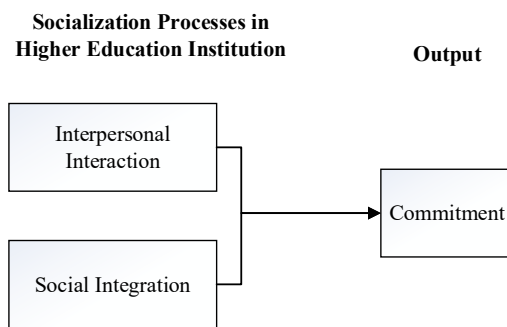


Figure 1. Research Model

Based on the research results of Talar & Gozaly (2025), it is hypothesized that variables from the Interpersonal Interaction dimension and the Social Integration dimension of students will have a positive influence on the Commitment of engineering faculty students in Indonesian private universities.

2.2. Research Variables

This research aims to find the influence of variables from the Interpersonal Interaction and Social Integration dimensions on student commitment, so it will involve independent and dependent variables. The independent variables consist of indicators of the Interpersonal Interaction dimension (questions regarding interactions between students and other students) and the Social Integration dimension (questions regarding students' social integration with academic life and social relationships on campus). Indicators from the Commitment dimension are the dependent variables that measure students' commitment to completing college.

The indicators of the Commitment dimension and Interpersonal Interaction dimension used for this research were measured using several questions adapted from the Institutional Integration Scale (IIS) compiled by Pascarella and Terenzini [6]. Meanwhile, the Social Integration dimension indicators are prepared based on activities held on campus, which students can take part. The Interpersonal Interaction dimension indicator as an independent variable

measures relationships between students, as can be seen in Table 1 below

Table 1.
Interpersonal Interaction dimension indicator
(independent variables)

Variable Name	Statement
CPERSONALREL	Since studying at the engineering faculty at X University, I have built close personal relationships with other students.
CSATREL	I feel satisfied with the friendships with other fellow students that I have built.
CSTUINFCHAR	My relationships with other fellow students have had a positive influence on my personal development, behavior, and character.
CSTUINFINT	My relationships with fellow students have had a positive influence on my intellectual development and interests.
CEASYREL	I easily make friends with other fellow students.
CHELP	When I have personal problems, there are many fellow students that I know who will listen and help me.
CSIMILAR	Many students at X University have similar characteristics and behavior to me.
CGOODTIME	Generally, I had a fun time with my fellow students.
CHELPSTUDY	My fellow students and I often help each other with lectures.

The answer scale for the Interpersonal Interaction indicator uses a Likert Scale, namely:

- Strongly Disagree: weight 1
- Disagree: weight 2
- Agree: weight 3
- Strongly Agree: weight 4

The Social Integration dimension indicator is used to measure student activity in the campus environment, through the activities they participate in while on campus, as can be seen in Table 2 below:

Table 2.
Social Integration dimension indicator (independent variables)

Variable Name	Statement
CEXT	Participation in extracurricular activities on campus.
CORGPORG	Participation in student activities at the study program level (for example student associations, comparative studies, new student orientation at the study program level, etc.).
CORGFAC	Participation in student activities at the faculty level (for example: sports week, new student orientation at the faculty level, etc.).
CORGUNIV	Participation in student activities at the university level (eg: campus introduction, etc.).
CACAD	Participation in academic activities other than lectures (for example: competitions, practicum assistants, teaching assistants for research, etc.).
CAVGSTUDY	Average frequency of studying together outside of class with other students (in 1 week).

The answer scale for the CEXT to CACAD variables uses the Guttman Scale, namely: Doesn't follow: weight 0, Follows: weight 1. Meanwhile, for the CAVGSTUDY variable, it consists of Rarely/code 1, 1-2 times/code 2, 3-4 times/ code 3, 5-6 times/code 4, and Not sure/code 5.

The Commitment dimension indicator as the dependent variable measures students' commitment to graduating on time with good grades, as can be seen in Table 3 below:

Table 3.
Commitment dimension indicator (dependent variables)

Variable Name	Statement
CRIGHTDEC	I am confident that I made the right decision in choosing to study at the engineering faculty of X University.
CGRAD	It is important for me to graduate from the engineering faculty of X University.
CONTIME	Graduating college on time is important to me.
CGRADE	Getting good grades is important to me.

The answer scale for the Commitment variable uses a Likert Scale, namely:

- Strongly Disagree: weight 1
- Disagree: weight 2
- Agree: weight 3
- Strongly Agree: weight 4

Apart from the dependent and independent variables above, this research also involves several questions related to the respondents' profile, which can be seen in Table 4 below:

Table 4.
Respondents' Profile

Variable Name	Statement
CGENDER	Gender (Male/code 1, Female/code 2)
CYEAR	Year (2016 and previous/code 1, 2017/code 2, 2018/code 3, 2019/code 4, 2020/code 5, 2021/code 6, 2022/code 7)
CGPA	GPA (do not have GPA/code 0, GPA < 2.00/code 1, GPA: 2.01 – 2.75/code 2, GPA: 2.76 – 3.50/code 3, GPA > 3.50/code 4)

2.3. Data Collection

The data used for this research was obtained through a questionnaire. Questionnaires were distributed based on a purposive sampling technique, namely to students representing each study program at the engineering faculty of X University (Civil Engineering, Electrical Engineering, Industrial Engineering, and Computer Systems study programs) who had completed at least 1 semester.

2.4. Data Processing

Data collected through questionnaires is processed using several data processing methods, as follows:

1. Preparing data, namely removing data outliers, and testing validity and reliability.
2. Descriptive statistical processing for profile data, independent variables, and dependent variables.
3. In this research, Binary Logistic Regression Analysis processing is used to look for the influence of independent variables on the dependent variable, because the dependent variable is on a non-metric scale, while the

independent variables are on a metric and non-metric scale [12], namely:

- Student Commitment Indicator (COMCAT) as the dependent variable (non-metric).
 - Indicators of the Interpersonal Interaction (metric), Social Integration (non-metric), and Student Profile (non-metric) dimensions as independent variables.
4. Crosstabulations processing to look for significant relationship patterns between independent variables that influence Commitment (based on Binary Logistic Regression Analysis processing) and other variables.
 5. Mapping the relationship pattern of Crosstabulation results using Correspondence Analysis [12].

3. Results and discussions

Questionnaires were collected from 101 students from the Civil Engineering, Electrical Engineering, Industrial Engineering, and Computer Systems study programs.

3.1. Data Preparation

Before the main processing, namely Binary logistic regression is carried out, the independent and dependent variables are prepared first, namely cleaning of outlier data, validity, and reliability testing is carried out. This data preparation resulted in 2 data being deleted, namely data from respondents 5 and 9. Thus, the data that could be processed further was 99 respondents.

3.2. Binary Logistic Regression Processing

Binary logistic regression processing is used to find independent variables that have a significant effect on the dependent variable, with non-metric dependent variables and metric/non-metric independent variables. This processing does not require testing classical assumptions.

In this research, the independent variables consist of Interpersonal Interaction, Social Integration, Gender, Class, and GPA. The dependent variable is obtained from the average of the four student Commitment indicator variables, then the average Commitment data is grouped into two categories, namely the high and low commitment categories. In determining category boundaries, the author performs the following calculations:

Commitment Category Limit =

$$\frac{\text{highest commitment avg} - \text{lowest commitment avg}}{2} = \frac{4.0 - 2.5}{2} = 3.25$$

So an average commitment of ≤ 3.25 is categorized as Low Commitment, and an average commitment of > 3.25 is categorized as High Commitment. This Commitment category is the dependent variable in Binary Logistic Regression processing.

The results of Binary Logistic Regression processing show that of the 24 independent variables processed, only 2 variables have a significant effect on Commitment Category (COMCAT), as shown in Step 2 in Table 5 below. Based on the Step 2 Model, the independent variables that significantly influence the Commitment Category are:

- CSIMILAR: Many students at X University have similar characteristics and behavior to me
- CORGPROG: Participation in student activities at the study program level (for example student associations, comparative studies, new student orientation at the study program level, etc.).

It can be seen from the B coefficient value in Model Step 2, that these two variables have a positive effect on Commitment, meaning that the more students feel that their colleagues have similar characteristics and behavior, the higher their commitment to graduating will be, the higher student participation in student activities at the study program level, the greater their commitment will be.

The results of research regarding the increasing commitment of students to graduate with a good GPA as the characteristics and behavior of fellow students become more similar are supported by research conducted by Sher et al. (2020) regarding the consistency of study habits and academic performance, where research by Sher et al. shows a strong relationship between students' habits and their academic performance [13]. If students are grouped with fellow students who have similar behavior in terms of consistent study habits, there will be an increase in academic performance. The important role of student activity in various activities on campus has been widely researched and proven in various studies. Students who are active in campus organizations have a higher retention rate than those who are not active [14]. Students may not understand the magnitude of the influence extra-curricular activities on campus have on their graduation, but student organizations play an important role in connecting students with life at the university [15].

Table 5.

Variables in the Equation

		B	S.E.	Wald	df	Sig.
Step 1 ^a	CORGPROG(1)	3.166	.586	29.182	1	.000
	Constant	-.799	.401	3.958	1	.047
Step 2 ^b	CSIMILAR	1.273	.513	6.151	1	.013
	CORGPROG(1)	3.495	.675	26.841	1	.000
	Constant	-4.091	1.440	8.074	1	.004

a. Variable(s) entered on step 1: CORGPROG.

b. Variable(s) entered on step 2: CSIMILAR.

CSIMILAR and CORGPROG can explain Commitment of 52.7% and have a high classification accuracy of 85.9% as shown in Tables 6 and 7 below.

High classification accuracy means the Binary Logistic Regression model formed from this research can be trusted.

Table 6.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	76.875 ^a	.313	.457
2	69.728 ^b	.361	.527

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Table 7.

Classification Table^a

		Predicted		
		COMCAT		Percentage Correct
		LOW COMMIT MENT	HIGH COMMIT MENT	
Step 1	COMCAT			
	LOW COMMITMENT	20	6	76.9
	HIGH COMMITMENT	9	64	87.7
Overall Percentage				84.8
Step 2	COMCAT			
	LOW COMMITMENT	20	6	76.9
	HIGH COMMITMENT	8	65	89.0
Overall Percentage				85.9

a. The cut value is .500

Data processing was continued with Crosstabulations and Correspondence Analysis to determine the pattern of relationships between the CSIMILAR and CORGPROG variables and other variables. By understanding these patterns, proposals for engineering faculty leaders can be more specific.

3.3. Crosstabulations and Correspondence Analysis Processing

Crosstabulations are used to find out statistically whether there is a relationship between 2 variables. The variables that will be processed by Crosstabulations are 2 independent variables that significantly influence Commitment, namely CSIMILAR, and CORGPROG. Correspondence Analysis is used for further processing of Crosstabulations, namely variables found to be related to Crosstabulations, mapped in a perceptual map so that researchers can get a visual picture of the pattern of relationships that occur. An example of a perceptual map is shown in Figure 2 below. Figure 2 shows an inverse relationship between the CSIMILAR and CEASYREL variables, namely that the more a student feels that his colleague has similar character and behavior, the more difficult it is for him to form friendships with that colleague.

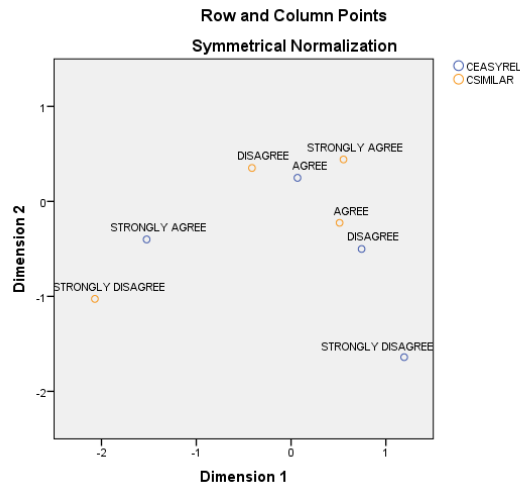


Figure 2. Perceptual map pattern of relationship between CMILAR dan CEASYREL

A summary of the results of Crosstabulations and Correspondence Analysis processing shows the relationship that occurs between CSIMILAR and CORGPROG with other variables, which can be seen in Table 8 below.

Table 8.
Significant Relationship Between CSIMILAR and Other Variables

Independent Variables	Profile	Crosstabulations Result	Relationship Pattern from Correspondence Analysis
CSIMILAR (Many students at X University have similar characteristics and behavior to me)	GPA	Eta Value = 0.284 (weak relationship)	Students who feel that their peers have similar characteristics and behavior will have a higher GPA, namely above 2.75.
	CEASYREL (I easily make friends with other fellow students)	Sig Pearson Chi Square = 0.017 (< 0.05, significant relationship)	The relationship that occurs is the opposite, namely the more students feel that their colleagues have similar character and behavior, the more difficult it is for students to form friendships with these colleagues.

Table 9.
Significant Relationship Between CORGPROG and Other Variables

Independent Variables	Profile	Crosstabulations Result	Relationship Pattern from Correspondence Analysis
CORGPROG (Participation in student activities at the study program level (for example student associations, comparative studies, new student orientation at the study program level, etc.)	CEXT (Participation in extracurricular activities on campus)	Sig. Contingency Coefficient = 0.000132 (< 0.05, significant relationship)	All students who are not active in student activities at the study program level are also not active in extracurricular activities.
	CORGFAC (Participation in student activities at the faculty level (for example: sports week,	Sig. Contingency Coefficient = 0.000038 (< 0.05, significant relationship)	All students who are not active in student activities at the study program level are also not active in student

new student orientation at the faculty level, etc.).		activities at the faculty level.
CORGUNIV (Participation in student activities at the university level (eg: campus introduction, etc.)	Sig. Contingency Coefficient = 0.000038 (< 0.05, significant relationship)	All students who are not active in student activities at the study program level are also not active in student activities at the university level.
CACAD (Participation in academic activities other than lectures (for example: competitions, practicum assistants, teaching assistants for research, etc.).	Sig. Contingency Coefficient = 0.000006 (< 0.05, significant relationship)	All students who are not active in student activities at the study program level are also not active in academic activities other than studying.

Tables 8 shows that students who feel that their peers have similar characteristics and behavior to them have higher GPAs and are highly committed to completing their studies, but have difficulty forming friendships with their fellow students. The results of this study are different from previous studies, where other research states that students will more easily form friendships with colleagues who are similar to them [16], [17]. This is interesting to investigate further, whether there are differences in friendly behavior between different faculty, or between different countries. Choosing friends is very important because social interactions will influence students' GPA [18], where orderliness behavior will increase students' GPA [19] while risky behavior will reduce students' GPA [20].

Table 9 shows that students who do not actively participate in student activities at the study program level are also not active in other activities (extracurricular, student activities at the faculty and university level, academic activities other than lectures), and they have a low commitment to completing their studies. The results of this study follow other studies that state that students' participation in various student activities has a positive effect on their academic success [21]–[23] and participation in organizations influences students' academic achievements [24]. With various activities in student affairs carried out in the campus environment, especially the study program environment, it will increase students' social activities, so do not become antisocial. Antisocial attitudes increase the risk of students not completing their studies [14], especially since the COVID pandemic has caused the growth of psychological problems and isolating behavior among students [25].

3.4. Descriptive Statistics

Table 10 below shows the results of descriptive statistical calculations for the Commitment variable and the independent variables that influence it. It can be seen that the majority of students are committed to graduating on time with good grades, as indicated by the Commitment Category (COMCAT) mode score = 2, which means high commitment. This is certainly a good thing, but it can still be improved. CSIMILAR, which is an independent variable that has a significant effect on Commitment, has a low average value of 2.5253 (maximum value 4) so this variable needs special attention, while the majority of students actively participate in student activities in the study program level, indicated by the CORGPROG mode value = 2.

Table 10.
Descriptive Statistics

Variable	Descriptive Statistics
COMCAT	Modus = 2 (Freq = 73), means High Commitment
CSIMILAR	Mean = 2.5253
CORGPROG	Modus = 2 (Freq = 70), means Aktif

3.5. Suggestions

The current average value of the CSIMILAR variable is still not high, namely 2.5253 (maximum value 4). To increase student commitment, the CSIMILAR score needs to be increased. Engineering faculty and study program leaders are advised to form various student activity units so that students can choose and join activity units that suit their character, and then find fellow students who have similar characteristics to them. Because the research results show that students find it difficult to form friendships with colleagues who behave in the same way, it is recommended that the activity units formed collaborate in carrying out activities, for example, the photography activity unit carries out joint activities with the nature lover activity unit. In this way, students have a group containing fellow students who have similar characters and behaviors to them but still have various activities with colleagues who have different characters and behaviors. Students are advised to make friends with friends outside their community, for example in various student activities, so that they can mix with friends from other study programs, with various backgrounds and characteristics [18].

University/faculty/study program leaders need to understand the interests, needs, and organizations that must be provided for students [15]. Leaders' awareness of the importance of student organizations needs to be increased because not all university/faculty/study program leaders understand the importance of student organizations for student retention [26].

To increase student participation in student activities at the study program level, engineering faculty and study program leaders are strongly advised to encourage students to participate in various activities on campus. Student activities require collaboration

between study programs, faculties, and student organizations. Support can be shown through facilitating the implementation of student activities that are positive for students, financial support, promoting these activities to students, and providing awards to the activity committee. If possible, these activities can also involve lecturers and faculty/study program staff, for example, through joint sports competitions. Study program leaders along with student organizations need to schedule academic and social activities every semester so that students are motivated to take part in these activities and are encouraged to make new friends when these activities are carried out [26]. Encouragement to actively participate in various campus activities must be done from an early age, namely for students who have just entered university until their first year, especially students who have their main choice of university elsewhere, because they have the opportunity not to complete their highest studies [27], [28].

With the proposals for establishing various activity units and organizing various student activities above, student commitment to completing their studies will increase.

4. Conclusions

This research aims to increase the retention of engineering faculty students at private universities in Indonesia, with a case study of the engineering faculty of a private university in Bandung, Indonesia. The variables used in this research are focused on student social relationships, namely student Interpersonal Interaction and Social Integration, and their influence on student commitment to completing studies on time with good grades. The results show that the variables that significantly influence student commitment are CSIMILAR (Many students at X University have similar characteristics and behavior to me) and CORGPROG (Participation in student activities at the study program level (for example, student associations, comparative studies, new student orientation at the study program level, etc.)), where these two variables have a positive effect on student commitment. The proposal given to the engineering faculty and study program leaders to increase students' commitment to completing their studies on time with good grades is to establish various activity units and organize various student activities.

Even though this research was only carried out at the engineering faculty of a private university in Bandung, the engineering faculty that was used as the research object has been around for a long time and has a variety of study programs so it is hoped that it is sufficient to describe the condition of engineering faculties at Indonesian private universities in general.

Further research, can be focused on increasing the GPA, which is also a variable that significantly influences the retention of engineering faculty students at Indonesian private universities [3]. On the other side, engineering student retention can be researched by adapting the Investment Model created by Rusbult,

where the Investment theoretical framework examines Commitment based on three factors that influence it, namely the level of satisfaction, the quality of available alternatives, and the level of investment [29], [30]. Further research can also be carried out to examine whether there are differences in friendly behavior in different faculties, or different countries because this research shows that respondents have difficulty establishing friendships with friends who behave in the same way as them and this is different from the results of previous studies.

Declaration statement

Yulianti Talar: **Conceptualization, Methodology, Writing-Original Draft.** Grace Vania: **Collecting data.** Jimmy Gozaly: **Writing-Review & Editing**

Disclosure statement

The author declares that this manuscript is free from conflict of interest and is processed by applicable journal provisions and policies to avoid deviations from publication ethics in various forms.

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Data availability statement

The authors confirm that the data supporting the findings of this study are available within the article or its supplementary materials.

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Yulianti Talar:

We have reached a decision regarding your submission to Journal Industrial Servicess, "Enhancing engineering student retention at Indonesian private university through improved interpersonal interactions and social integration".

Our decision is to: Revision required

Revised the manuscript according to comments from our reviewer and editors. Submit the revision through OJS.

You can find the comments from our editor and reviewer below.

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Reviewer A:

Comments to Authors (Abstract, Introduction, Method, Results and Discussions, Conclusions). (Required):

1. The manuscript effectively identifies key variables of interest: interpersonal interaction, social integration, and commitment. However, the specific research questions or hypotheses driving this investigation remain unstated. Explicitly formulating these would significantly enhance the clarity and direction of the study. The objective of this research should be clearly stated in the Abstract.
2. The manuscript mentions several variables (e.g., CSIMILAR, CORGPROG, COMCAT) but fails to provide sufficient detail regarding their operationalization. Specifically, the manuscript lacks clear explanations of what these variables represent and how they were measured. Providing a more detailed description of the operationalization of these variables would significantly enhance the study's transparency and allow for better understanding and interpretation of the findings.

3. The results section presents statistical outputs (e.g., Tables 5, 6, and 7), but it lacks a comprehensive discussion of their implications. For instance, the significance of variables like CSIMILAR and CORGPROG in predicting commitment could be explored more thoroughly, linking them back to the existing theoretical framework and prior research findings.
4. The manuscript neglects to explicitly discuss the limitations of the research. Acknowledging potential limitations, such as sample size, generalizability, or methodological constraints, would provide a more balanced perspective and offer valuable insights for future research directions.
5. While the manuscript includes some figures (e.g., Figure 1: Research Model), incorporating additional visual aids, such as graphs or charts, to illustrate key findings could significantly enhance the readability and impact of the results.
6. The manuscript reports eta values and contingency coefficients but fails to adequately discuss their practical significance. Interpreting these statistics within the context of the research objectives would enhance the reader's understanding and accessibility of the findings.

Editor

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Original research



Enhancing engineering student retention at Indonesian private university through improved interpersonal interactions and social integration

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ABSTRACT

The high dropout rate among engineering students in Indonesia, particularly at private universities, provides the context for this research. **This study examines how interpersonal interaction and social integration influence students' commitment to completing their studies.** Data were collected through a questionnaire distributed to engineering students at a private university, specifically targeting those who had completed one semester. A total of 101 responses were gathered. The data analysis utilized binary logistic regression, which revealed that two variables—CSIMILAR (indicating a sense of similarity among students) and CORGPROG (involvement in student activities at the program level, such as student associations, comparative studies with other universities, orientation for new students, etc.)—positively affect students' commitment to their studies. Additionally, the results of crosstabulations and correspondence analysis highlighted the relationship patterns between the CSIMILAR and CORGPROG variables and other factors. Based on these findings, it is recommended that the engineering faculty and study program management develop various activity units and organize a diverse range of student activities to enhance students' commitment to completing their studies.

1. Introduction

The progress of a country is greatly influenced by the participation of society, especially the active involvement of its youth through the application and development of various knowledge and skills. That is why, higher education has a great responsibility in preparing youth, as the country's most important asset, in developing the country [1]. Indonesia is a developing country that needs a big role from its youth to be able to become a developed country.

Just like in other countries, Indonesia's development requires a combination of various sciences and skills, and one of the most important sciences is engineering. High school students' interest in continuing their studies at the engineering faculty is quite high, as shown by engineering being in fourth place among the scientific fields chosen by Indonesian high school students to continue their studies. Unfortunately, 18.34% of high school students do not complete their studies and engineering is the third scientific field that has the highest drop-out rate [2]. The highest contributor to drop-outs is occupied by private

universities, namely 8%, while state universities only account for 2% [2], this happens because many state universities are considered better than private universities in terms of quality of education and acceptance in the industry. Often a new private university is chosen when high school students are not accepted at a public university, and even high school students are willing to re-enroll at their dream public university in the coming year if they are not accepted that year [3]. Engineering faculties at Indonesian private universities face big challenges in ensuring that the engineering students they train can complete their studies.

Talar and Gozaly's (2025) research conducted at engineering faculties at a private university in Indonesia shows that student retention is influenced by student satisfaction with close social relationships with fellow students and GPA [3]. In Talar and Gozaly's research, the student retention category was divided into 4 categories, namely Persister (students who will continue their studies according to the curriculum), Slow-Down (students who will continue their studies but only take a few courses), Stop-out (students who

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plan to take leave, but will continue their studies again), and Leavers (students who will not continue their studies/drop-out). To have students with the Persister retention category, a balance is needed between the student's satisfaction score with close social relationships with fellow students and the GPA score, where low satisfaction with social relationships with fellow students will result in the student not continuing their studies (Leaver) [3]. The results of Talar and Gozaly's research on engineering faculty students are by Tinto's research, which deeply explores the topic of student retention in higher education, stating that academic and social integration are important factors in student retention [4].

This research continues the research results of Talar and Gozaly (2025) above where this research focuses on the socialization process of private university engineering faculty students, with the main aim being that private university engineering faculty leaders can improve student social relations with fellow students, as an effort to increase student commitment finish college. The conceptual model from Weidman (2006) regarding the Organizational Socialization of Students in Higher Education is used in this research, to observe all student Input-Environment-Socialization Output [5]. In Weidman's model, the Input for higher education is the attributes of prospective students (family background, beliefs and values held, and previous academic preparation). The Environment shows the organizational structure and normative context of higher education institutions that influence students through the socialization process. (interpersonal interaction and social integration) and learning which connect students with the main normative environment in higher education, while Socialization Outcomes are the result of changes (knowledge, skills, and character) that occur in students during college.

In accordance with the research results of Talar and Gozaly (2025), this research is limited to the Environment, namely the socialization process that occurs in the engineering faculty private university environment, including interpersonal interaction and social integration of students and the output is in the form of student commitment to completing their studies. Learning is not discussed in this research because learning discusses the relationship between students and study programs/faculties. Students' commitment to completing college will adapt to the Institutional and Goal Commitment factors from Pascarella and Terenzini [6], which measure students' commitment to graduating from college, confidence in their choices, and others. This Institutional and Goal Commitment factor was adopted because it is very in line with Talar and Gozaly's (2025) previous research, namely increasing student retention, namely graduating from engineering faculty on time, with a good GPA.

Research has been conducted on the influence of student socialization processes on university retention, and has provided mixed results. Research by Rosa and Oliveira (2022) shows that Social Integration has a direct

influence on commitment [7]. The socialization process that occurs between students in a learning community has been proven to significantly influence GPA, student retention, and academic performance of first-year students [8]. Socially healthy students (for example active in organizations) have higher GPA scores than students who are not active in organizations [9]. However, research conducted by Ishitani (2016) shows that for first-year students, social integration (student activity in various non-academic clubs on campus) does not significantly influence the student's persistence in the second year, while academic integration (student participation in group work activities, the relationship between students and faculty/study programs/lecturers) has a significant influence [10]. Various factors can encourage student social integration, namely through interactions between faculty and students, interactions with peers, extracurricular activities, campus life, and social networking sites [11].

Although there is quite a lot of previous research on the influence of the student socialization process on retention, no one has researched the influence of the student socialization process on the commitment of engineering faculty students in Indonesia, specifically for private universities which of course have different characteristics from public universities.

This research is needed to help leaders of engineering faculties in private universities in Indonesia to increase their students' commitment to graduating on time with good GPAs, increase the sustainability of engineering faculties in private universities, and ultimately help educate young people in developing Indonesia.

2. Material and method

2.1. Research Model

The model used in this research can be seen in Figure 1 below. This research continues the research results of Talar & Gozaly (2025) that the retention of private university engineering faculty students in Indonesia is influenced by student satisfaction with close social relationships with fellow students and GPA [3], so this research is limited to only discussing the influence of variables from the Interpersonal Interaction dimension and the Social Integration dimension towards the Commitment dimension of private university engineering faculty students.

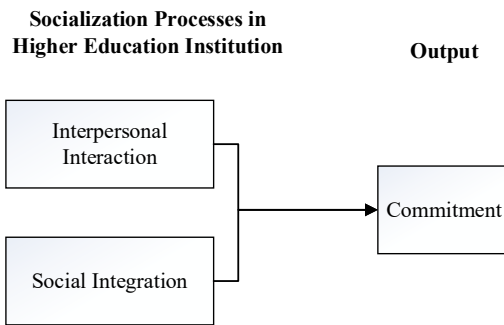


Figure 1. Research Model

Based on the research results of Talar & Gozaly (2025), it is hypothesized that variables from the Interpersonal Interaction dimension and the Social Integration of students will have a positive influence on the Commitment of engineering faculty students in Indonesian private universities. **The hypothesis structure used in this study is as follows:**

- H₀₁ : The Interpersonal Interaction dimension indicators do not have a significant effect on Commitment.**
- H_{a1} : The Interpersonal Interaction dimension indicators have a significant effect on Commitment.**
- H₀₂ : The Social Integration dimension indicators do not have a significant effect on Commitment.**
- H_{a2} : The Social Integration dimension indicators have a significant effect on Commitment.**

2.2 Research Variables

This research aims to find the influence of variables from the Interpersonal Interaction and Social Integration dimensions on student commitment, so it will involve independent and dependent variables. The independent variables consist of indicators of the Interpersonal Interaction dimension (questions regarding interactions between students and other students) and the Social Integration dimension (questions regarding students' social integration with academic life and social relationships on campus). Indicators from the Commitment dimension are the dependent variables that measure students' commitment to completing college.

The indicators of the Commitment dimension and Interpersonal Interaction dimension used for this research were measured using several questions adapted from the Institutional Integration Scale (IIS) compiled by Pascarella and Terenzini [6]. **The Interpersonal Interaction dimension indicator, as an independent variable, measures how students perceive their social relationships with their peers. The quality of interpersonal interactions among students in college is recognized as one of the key factors contributing to student satisfaction and success throughout the**

learning process [12], [13]. Interpersonal Interaction dimension indicators can be seen in Table 1.

Table 1.

Interpersonal Interaction dimension indicator (independent variables)

Variable Name	Statement
CPERSONALREL	Since studying at the engineering faculty at X University, I have built close personal relationships with other students.
CSATREL	I feel satisfied with the friendships with other fellow students that I have built.
CSTUINFCHAR	My relationships with other fellow students have had a positive influence on my personal development, behavior, and character.
CSTUINFINT	My relationships with fellow students have had a positive influence on my intellectual development and interests.
CEASYREL	I easily make friends with other fellow students.
CHELP	When I have personal problems, there are many fellow students that I know who will listen and help me.
CSIMILAR	Many students at X University have similar characteristics and behavior to me.
CGOODTIME	Generally, I had a fun time with my fellow students.
CHELPSTUDY	My fellow students and I often help each other with lectures.

To assess the Interpersonal Interaction dimension indicator, student respondents were asked to choose one of the most appropriate answers, related to their experiences when interacting with fellow students. This measurement uses a Likert Scale, namely:

- Strongly Disagree: weight 1
- Disagree: weight 2
- Agree: weight 3
- Strongly Agree: weight 4

The Social Integration dimension indicators are prepared based on activities held on campus, which students can take part, to measure student participation in activities while on campus. The Social Integration dimension indicators can be seen in Table 2.

Table 2.

Social Integration dimension indicator (independent variables)

Variable Name	Statement
CEXT	Student participation in extracurricular activities on campus.
CORGPORG	Student participation in student activities at the study program level (for example student associations, comparative studies, new student orientation at the study program level, etc.).
CORGFAC	Student participation in student activities at the faculty level (for example: sports week, new student orientation at the faculty level, etc.).
CORGUNIV	Student participation in student activities at the university level (eg: campus introduction, etc.).
CACAD	Student participation in academic activities other than lectures (for example: competitions, practicum assistants, teaching assistants for research, etc.).
CAVGSTUDY	Average frequency of studying together outside of class with other students (in 1 week).

To assess the Social Integration dimension indicator, respondents were asked to choose one of the most appropriate answers, according to what they are currently experiencing, namely: measurement for the CEXT, CORGPROG, CORGFAC, CORGUNIV, and CACAD variables uses the Guttman Scale, namely: Doesn't follow: weight 0, Follows: weight 1. Meanwhile, measurement for the CAVGSTUDY variable consists of Rarely/code 1, 1-2 times/code 2, 3-4 times/ code 3, 5-6 times/code 4, and Not-sure/code 5.

Commitment to the institution is demonstrated by the resilience, motivation, and interest of employees to work in the organization [14]. In this study, student commitment to the university is shown by the students' resilience to graduate on time with good grades. The Commitment dimension indicator as the dependent variable can be seen in Table 3.

Table 3.

Commitment dimension indicator (dependent variables)

Variable Name	Statement
CRIGHTDEC	I am confident that I made the right decision in choosing to study at the engineering faculty of X University.
CGRAD	It is important for me to graduate from the engineering faculty of X University.
CONTIME	Graduating college on time is important to me.
CGRADE	Getting good grades is important to me.

To assess the Commitment dimension indicator, respondents were asked to select the most appropriate answer based on their feelings. The measurement of the Commitment dimension indicator utilizes a Likert Scale, which includes:

- Strongly Disagree: weight 1
- Disagree: weight 2
- Agree: weight 3
- Strongly Agree: weight 4

Apart from the dependent and independent variables above, this research also involves several questions related to the respondents' profile, which can be seen in Table 4 below:

Table 4.

Respondents' Profile

Variable Name	Statement
CGENDER	Gender (Male/code 1, Female/code 2)
CYEAR	Year (2016 and previous/code 1, 2017/code 2, 2018/code 3, 2019/code 4, 2020/code 5, 2021/code 6, 2022/code 7)
CGPA	GPA (do not have GPA/code 0, GPA < 2.00/code 1, GPA: 2.01 – 2.75/code 2, GPA: 2.76 – 3.50/code 3, GPA > 3.50/code 4)

2.2 Data Collection

The data used for this research was obtained through a questionnaire. Questionnaires were distributed based on a purposive sampling technique, namely to students representing each study program at

the engineering faculty of X University (Civil Engineering, Electrical Engineering, Industrial Engineering, and Computer Systems study programs) who had completed at least 1 semester.

2.3 Data Processing

Data collected through questionnaires is processed using several data processing methods, as follows:

1. Preparing data, namely removing data outliers, and testing validity and reliability.
2. Descriptive statistical processing for profile data, independent variables, and dependent variables.
3. In this research, Binary Logistic Regression Analysis processing is used to look for the influence of independent variables on the dependent variable, because the dependent variable is on a non-metric scale, while the independent variables are on a metric and non-metric scale [15], namely:
 - Student Commitment Indicator (COMCAT) as the dependent variable (non-metric).
 - Indicators of the Interpersonal Interaction (metric), Social Integration (non-metric), and Student Profile (non-metric) dimensions as independent variables.
4. Crosstabulations processing to look for significant relationship patterns between independent variables that influence Commitment (based on Binary Logistic Regression Analysis processing) and other variables.
5. Mapping the relationship pattern of Crosstabulation results using Correspondence Analysis [15].

3. Results and discussions

Questionnaires were collected from 101 students from the Civil Engineering, Electrical Engineering, Industrial Engineering, and Computer Systems study programs.

3.1 Data Preparation

Before the main processing, namely Binary logistic regression is carried out, the independent and dependent variables are prepared first, namely cleaning of outlier data, validity, and reliability testing is carried out. This data preparation resulted in 2 data being deleted, namely data from respondents 5 and 9. Thus, the data that could be processed further was 99 respondents.

3.2 Binary Logistic Regression Processing

Binary logistic regression processing is used to find independent variables that have a significant effect on the dependent variable, with non-metric dependent

variables and metric/non-metric independent variables. This processing does not require testing classical assumptions.

In this research, the independent variables consist of Interpersonal Interaction, Social Integration, Gender, Class, and GPA. The dependent variable is obtained from the average of the four student Commitment indicator variables, then the average Commitment data is grouped into two categories, namely the high and low commitment categories. In determining category boundaries, the author performs the following calculations:

Commitment Category Limit =

$$\frac{\text{highest commitment avg} - \text{lowest commitment avg}}{2} = \frac{4.0 - 2.5}{2} = 3.25$$

So, an average commitment of ≤ 3.25 is categorized as Low Commitment, and an average commitment of > 3.25 is categorized as High Commitment. This Commitment category is the dependent variable in Binary Logistic Regression processing.

The results of Binary Logistic Regression processing show that of the 24 independent variables processed, only 2 variables have a significant effect on Commitment Category (COMCAT), as shown in Step 2 in Table 5 below. Based on the Step 2 Model, the independent variables that significantly influence the Commitment Category are:

- CSIMILAR: Many students at X University have similar characteristics and behavior to me.
- CORGPROG: Participation in student activities at the study program level (for example student associations, comparative studies, new student orientation at the study program level, etc.).

It can be seen from the B coefficient value in Model Step 2, that these two variables have a positive effect on Commitment, meaning that the more students feel that their colleagues have similar characteristics and behavior, the higher their commitment to graduating will be, the higher student participation in student activities at the study program level, the greater their commitment will be. The findings from the Logistic Regression analysis in this study support the research model used. Specifically, the dimensions of Interpersonal Interaction (represented by the CSIMILAR indicator) and Social Integration (represented by the CORGPROG indicator) have a significant impact on student commitment.

Among these, the CORGPROG variable demonstrates a stronger influence on category commitment compared to CSIMILAR, as indicated by the lower significance value (Sig.) for CORGPROG (see Table 5). The important role of student activity in various activities on campus has been widely researched and proven in various studies. Students who are active in campus organizations have a higher retention rate than those who are not active [16].

Students may not understand the magnitude of the influence extra-curricular activities on campus have on their graduation, but student organizations play an important role in connecting students with life at the university [17].

The results of research regarding the increasing commitment of students to graduate with a good GPA as the characteristics and behavior of fellow students become more similar are supported by research conducted by Sher et al. (2020) regarding the consistency of study habits and academic performance, where research by Sher et al. shows a strong relationship between students' habits and their academic performance [18]. If students are grouped with fellow students who have similar behavior in terms of consistent study habits, there will be an increase in academic performance.

Table 5.
Variables in the Equation

		B	S.E.	Wald	df	Sig.
Step 1 ^a	CORGPROG(1)	3.166	.586	29.182	1	.000
	Constant	-.799	.401	3.958	1	.047
Step 2 ^b	CSIMILAR	1.273	.513	6.151	1	.013
	CORGPROG(1)	3.495	.675	26.841	1	.000
	Constant	-4.091	1.440	8.074	1	.004

a. Variable(s) entered on step 1: CORGPROG.

b. Variable(s) entered on step 2: CSIMILAR.

CSIMILAR and CORGPROG can explain Commitment of 52.7% and have a high classification accuracy of 85.9% as shown in Tables 6 and 7 below. High classification accuracy means the Binary Logistic Regression model formed from this research can be trusted.

By knowing the students' perception scores regarding their assessment of the similarity of characteristics and behavior of other students, supplemented with information about student participation in various activities in the study program, it can be known whether the student has a high or low commitment to graduating on time with good grades, with an accuracy rate of 85.9%. The best commitment will be obtained if a student is active in activities in the study program and assesses that the characteristics and behavior of other students are similar to them.

Table 6.
Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	76.875 ^a	.313	.457
2	69.728 ^b	.361	.527

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Table 7.
Classification Table^a

Observed	Predicted		
	COMCAT		Percentage Correct
	LOW COMMI TMENT	HIGH COMMI TMENT	

Step 1	COMCAT	LOW COMMITMENT	20	6	76.9
		HIGH COMMITMENT	9	64	87.7
		Overall Percentage			84.8
Step 2	COMCAT	LOW COMMITMENT	20	6	76.9
		HIGH COMMITMENT	8	65	89.0
		Overall Percentage			85.9

a. The cut value is .500

Data processing was continued with Crosstabulations and Correspondence Analysis to determine the pattern of relationships between the CSIMILAR and CORGPROG variables and other variables. By understanding these patterns, proposals for engineering faculty leaders can be more specific.

3.3 Crosstabulations and Correspndence Analysis Processing

Crosstabulations are used to find out statistically whether there is a relationship between 2 variables. The variables that will be processed by Crosstabulations are 2 independent variables that significantly influence Commitment, namely CSIMILAR, and CORGPROG. Correspondence Analysis is used for further processing of Crosstabulations, namely variables found to be related to Crosstabulations, mapped in a perceptual map so that researchers can get a visual picture of the pattern of relationships that occur. An example of a perceptual map is shown in Figure 2 below. Figure 2 shows an inverse relationship between the CSIMILAR and CEASYREL variables, namely that the more a student feels that his colleague has similar character and behavior, the more difficult it is for him to form friendships with that colleague.

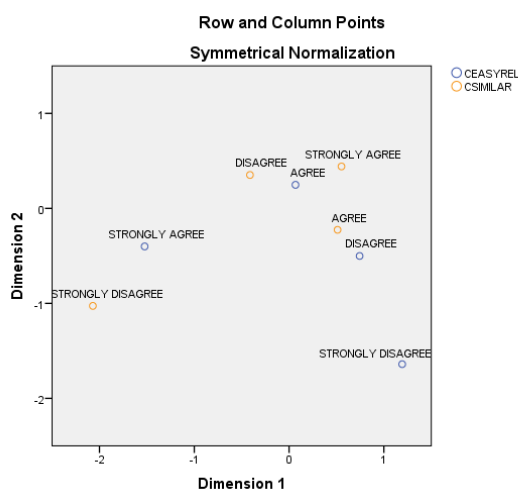


Figure 2. Perceptual map pattern of relationship between CMILAR dan CEASYREL

A summary of the results of Crosstabulations and Correspondence Analysis processing shows the relationship that occurs between CSIMILAR and CORGPROG with other variables, which can be seen in Table 8 below. The Eta value is a statistic used to indicate the strength of the relationship between metric variables (in this study, CSIMILAR) and categorical variables (in this study, GPA). The eta value ranges from 0 to 1, where 0 indicates no correlation and 1 signifies a very strong correlation [19]. In this case, the Eta value between CSIMILAR and GPA is 0.284, suggesting a relationship between the two variables. Specifically, students who feel that their colleagues share similar characteristics and behaviors tend to have a higher GPA, though the strength of this relationship is relatively low.

Furthermore, the significance value for Pearson's Chi-Square test, which is below 0.05, indicates a statistically significant relationship between the two metric variables. In this study, the significance value (Sig.) for Pearson's Chi-Square between CSIMILAR and CEASYREL is 0.017, which also shows a significant relationship. However, the data reveals an opposite trend: the more students perceive their colleagues to have similar characteristics and behaviors, the more challenging it becomes for them to establish friendships.

Table 8.
Significant Relationship Between CSIMILAR and Other Variables

Independent Variables	Profile	Crosstabulations Result	Relationship Pattern from Correspondence Analysis
CSIMILAR (Many students at X University have similar characteristics and behavior to me)	GPA	Eta Value = 0.284 (weak relationship)	Students who feel that their colleagues have similar characteristics and behavior will have a higher GPA, namely above 2.75.
	CEASYREL (I easily make friends with other fellow students)	Sig Pearson Chi Square = 0.017 (< 0.05, significant relationship)	The relationship that occurs is the opposite, namely the more students feel that their colleagues have similar character and behavior, the more difficult it is for students to form friendships with these colleagues.

Tables 8 shows that students who feel that their peers have similar characteristics and behavior to them have higher GPAs and are highly committed to completing their studies, but have difficulty forming friendships with their fellow students. The results of this study are different from previous studies, where other research states that students will more easily form friendships with colleagues who are similar to them [20], [21]. This is interesting to investigate further, whether there are differences in friendly behavior between different faculty, or between different countries. Choosing friends is very important because social interactions will influence students' GPA [22], where orderliness behavior will increase students' GPA [23] while risky behavior will reduce students' GPA [24].

The Contingency Coefficient is a metric used to illustrate the relationship between two categorical

variables. Table 9 below displays the categorical variables that exhibit a significant relationship, indicated by a Sig. Contingency Coefficient value below 0.05. A lower Sig. Contingency Coefficient value indicates a stronger relationship between the two variables. In this case, CORGPROG demonstrates the strongest relationship with CACAD, which means that students who are not active in student activities at the program level are also likely to be inactive in academic activities beyond their studies.

Table 9.

Significant Relationship Between CORGPROG and Other Variables

Independent Variables	Profile	Crosstabulations Result	Relationship Pattern from Correspondence Analysis
CORGPROG (Participation in student activities at the study program level (for example student associations, comparative studies, new student orientation at the study program level, etc.)	CEXT (Participation in extracurricular activities on campus)	Sig. Contingency Coefficient = 0.000132 (< 0.05, significant relationship)	All students who are not active in student activities at the study program level are also not active in extracurricular activities.
	CORGFAC (Participation in student activities at the faculty level (for example: sports week, new student orientation at the faculty level, etc.).	Sig. Contingency Coefficient = 0.000038 (< 0.05, significant relationship)	All students who are not active in student activities at the study program level are also not active in student activities at the faculty level.
	CORGUNIV (Participation in student activities at the university level (eg: campus introduction, etc.)	Sig. Contingency Coefficient = 0.000038 (< 0.05, significant relationship)	All students who are not active in student activities at the study program level are also not active in student activities at the university level.
	CACAD (Participation in academic activities other than lectures (for example: competitions, practicum assistants, teaching assistants for research, etc.).	Sig. Contingency Coefficient = 0.000006 (< 0.05, significant relationship)	All students who are not active in student activities at the study program level are also not active in academic activities other than studying.

Table 9 shows that students who do not actively participate in student activities at the study program level are also not active in other activities (extracurricular, student activities at the faculty and university level, academic activities other than lectures), and they have a low commitment to completing their

studies. The results of this study follow other studies that state that students' participation in various student activities has a positive effect on their academic success [25]–[27] and participation in organizations influences students' academic achievements [28]. With various activities in student affairs carried out in the campus environment, especially the study program environment, it will increase students' social activities, so do not become antisocial. Antisocial attitudes increase the risk of students not completing their studies [16], especially since the COVID pandemic has caused the growth of psychological problems and isolating behavior among students [29].

3.4 Descriptive Statistics

Table 10 below shows the results of descriptive statistical calculations for the Commitment variable and the independent variables that influence it. It can be seen that the majority of students are committed to graduating on time with good grades, as indicated by the Commitment Category (COMCAT) mode score = 2, which means high commitment. This is certainly a good thing, but it can still be improved. CSIMILAR, which is an independent variable that has a significant effect on Commitment, has a low average value of 2.5253 (maximum value 4) so this variable needs special attention, while the majority of students actively participate in student activities in the study program level, indicated by the CORGPROG mode value = 2.

Table 10.

Descriptive Statistics

Variable	Descriptive Statistics
COMCAT	Modus = 2 (Freq = 73), means High Commitment
CSIMILAR	Mean = 2.5253
CORGPROG	Modus = 2 (Freq = 70), means Aktif

3.5 Suggestions

The current average value of the CSIMILAR variable is still not high, namely 2.5253 (maximum value 4). To increase student commitment, the CSIMILAR score needs to be increased. Engineering faculty and study program leaders are advised to form various student activity units so that students can choose and join activity units that suit their character, and then find fellow students who have similar characteristics to them. Because the research results show that students find it difficult to form friendships with colleagues who behave in the same way, it is recommended that the activity units formed collaborate in carrying out activities, for example, the photography activity unit carries out joint activities with the nature lover activity unit. In this way, students have a group containing fellow students who have similar characters and behaviors to them but still have various activities with colleagues who have different characters and behaviors. Students are advised to make friends with friends outside their community, for example in various student activities, so that they can mix with friends from

other study programs, with various backgrounds and characteristics [22].

University/faculty/study program leaders need to understand the interests, needs, and organizations that must be provided for students [17]. Leaders' awareness of the importance of student organizations needs to be increased because not all university/faculty/study program leaders understand the importance of student organizations for student retention [30].

To increase student participation in student activities at the study program level, engineering faculty and study program leaders are strongly advised to encourage students to participate in various activities on campus. Student activities require collaboration between study programs, faculties, and student organizations. Support can be shown through facilitating the implementation of student activities that are positive for students, financial support, promoting these activities to students, and providing awards to the activity committee. If possible, these activities can also involve lecturers and faculty/study program staff, for example, through joint sports competitions. Study program leaders along with student organizations need to schedule academic and social activities every semester so that students are motivated to take part in these activities and are encouraged to make new friends when these activities are carried out [30]. Encouragement to actively participate in various campus activities must be done from an early age, namely for students who have just entered university until their first year, especially students who have their main choice of university elsewhere, because they have the opportunity not to complete their highest studies [31], [32]. With the proposals for establishing various activity units and organizing various student activities above, student commitment to completing their studies will increase.

This study has certain limitation, specifically that the sample is drawn exclusively from one engineering faculty at a private university in Indonesia. To enhance the generalizability of the research findings, it is important to expand the sample size and include students from multiple engineering faculties across various regions in Indonesia. This would provide a more comprehensive understanding of the characteristics of engineering students at private universities in the country.

Further research, can be focused on increasing the GPA, which is also a variable that significantly influences the retention of engineering faculty students at Indonesian private universities [3]. On the other side, engineering student retention can be researched by adapting the Investment Model created by Rusbult, where the Investment theoretical framework examines Commitment based on three factors that influence it, namely the level of satisfaction, the quality of available alternatives, and the level of investment [33], [34]. Further research can also be carried out to examine whether there are differences in friendly behavior in different faculties, or different countries because this research shows that respondents have difficulty

establishing friendships with friends who behave in the same way as them and this is different from the results of previous studies.

4. Conclusions

This research aims to increase the retention of engineering faculty students at private universities in Indonesia, with a case study of the engineering faculty of a private university in Bandung, Indonesia. The variables used in this research are focused on student social relationships, namely student Interpersonal Interaction and Social Integration, and their influence on student commitment to completing studies on time with good grades. The results show that the variables that significantly influence student commitment are CSIMILAR (Many students at X University have similar characteristics and behavior to me) and CORGPROG (Participation in student activities at the study program level (for example, student associations, comparative studies, new student orientation at the study program level, etc.)), where these two variables have a positive effect on student commitment. The proposal given to the engineering faculty and study program leaders to increase students' commitment to completing their studies on time with good grades is to establish various activity units and organize various student activities.

Declaration statement

Yulianti Talar: **Conceptualization, Methodology, Writing-Original Draft.** Grace Vania: **Collecting data.** Jimmy Gozaly: **Writing-Review & Editing**

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Disclosure statement

The author declares that this manuscript is free from conflict of interest and is processed by applicable journal provisions and policies to avoid deviations from publication ethics in various forms.

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Data availability statement

The authors confirm that the data supporting the findings of this study are available within the article or its supplementary materials.

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Respond form

Authors are required to respond to all comments from the Reviewer and Editor. Authors must indicate in the revised manuscript the sections that have been revised.

Reviewer #1

No	Comments	Respond
1	The manuscript effectively identifies key variables of interest: interpersonal interaction, social integration, and commitment. However, the specific research questions or hypotheses driving this investigation remain unstated. Explicitly formulating these would significantly enhance the clarity and direction of the study. The objective of this research should be clearly stated in the Abstract.	• The hypothesis structure in 2.1 <i>Research Model</i>. • <i>Abstract</i>: This study examines how interpersonal interaction and social integration influence students' commitment to completing their studies.
2	The manuscript mentions several variables (e.g., CSIMILAR, CORGPROG, COMCAT) but fails to provide sufficient detail regarding their operationalization. Specifically, the manuscript lacks clear explanations of what these variables represent and how they were measured. Providing a more detailed description of the operationalization of these variables would significantly enhance the study's transparency and allow for better understanding and interpretation of the findings.	More explanations about variables dan operationalization of these variables, in 2.2 <i>Research Variables</i> .
3	The results section presents statistical outputs (e.g., Tables 5, 6, and 7), but it lacks a comprehensive discussion of their implications. For instance, the significance of variables like CSIMILAR and CORGPROG in predicting commitment could be explored more thoroughly, linking them back to the existing theoretical framework and prior research findings.	More explanations about Binary Logistic Regression processing output in 3.2 <i>Binary Logistic Regression Processing</i>
4	The manuscript neglects to explicitly discuss the limitations of the research. Acknowledging potential limitations, such as sample size, generalizability, or methodological constraints, would provide a more balanced perspective and offer valuable insights for future research directions.	Limitations of the research in 3.5 <i>Suggestions</i>
5	While the manuscript includes some figures (e.g., Figure 1: Research Model), incorporating additional visual aids, such as graphs or charts, to illustrate key findings could significantly enhance the readability and impact of the results.	Research model in 2.1 <i>Reseach Model</i> .
6	The manuscript reports eta values and contingency coefficients but fails to adequately discuss their practical significance. Interpreting these statistics within the context of the research objectives would enhance the reader's understanding and accessibility of the findings.	More explanations about eta values and contingency coeff in 3.3 <i>Crosstabulations and Corresspondence Analysis Processing</i>

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No	Comments	Respond
1	Use the latest journal's template. Download from our journal.	Revised
2	Use red font for the revised sections to make it easier for the editor to check.	Revised
3	Use at least 30 articles from proceedings dan journals as references. Make sure to use IEEE style for references and citations. At least 50% must be from English sources.	Revised
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BK

Bobby Kurniawan <jurnaluntirta2024@gmail.com>

To: Yulianti

Cc: Jimmy Gozaly; Grace Vania <vaniacho03@gmail.com>

Sun 3/23/2025 9:57 AM

Yulianti Talar:

We have reached a decision regarding your submission to Journal Industrial Servicess, "Enhancing engineering student retention at Indonesian private university through improved interpersonal interactions and social integration".

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NOTE: Although it has been accepted, the article cannot be published until the editing process is complete. Our staff will contact you shortly. The article cannot be published until it is marked as complete by our staff.

Bobby Kurniawan
Universitas Sultan Ageng Tirtayasa
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Bobby Kurniawan <jurnaluntirta2024@gmail.com>      

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Yulianti Talar:

Thank you for reviewing the copyediting of your manuscript, "Enhancing engineering student retention at Indonesian private university through improved interpersonal interactions and social integration," for Journal Industrial Serviss. We look forward to publishing this work.

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