

Modelling the Impact of Student Resilience on Attrition Risk in Higher Education: A Structural Equation Modelling Approach

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ARTICLE INFO

Keywords:

resilience;
student attrition;
drop-outs;
opt-outs;
stop-outs;
transfer-outs

Article history:

Received 2025-10-04

Revised 2025-12-22

Accepted 2026-03-31

ABSTRACT

Resilience is a factor that affects student attrition in higher education. The objectives of the study were (1) to describe the resilience profile of Universitas Pamulang (UNPAM) students and (2) to obtain the results of the level of influence of student resilience on the potential for study dropout at UNPAM. The research method used is a quantitative method using a structural equation modelling (SEM) approach. The research population was UNPAM students who indicated dropping out of study with 387 respondents. The results obtained the data show that 70% of respondents are employed, which illustrates economic stability as a factor supporting resilience. Income level also correlates positively with resilience, with higher-income groups scoring higher on resilience. The resilience profile based on seven dimensions shows optimism, emotional regulation, and impulse control as the highest aspects, while causal analysis and empathy are relatively weak aspects. The influence of resilience for causal analysis indicators, empathy has a positive effect on drop-outs, opt-outs, stop-outs, and transfer-outs. Indicators of emotional regulation, optimism, and reaching out negatively affect drop-outs, opt-outs, stop-outs, and transfer-outs. Indicators of self-efficacy have a positive effect on drop-outs and stop outs and a negative effect on opt-outs and transfer-outs. These findings suggest that higher education institutions should prioritize psychological interventions focused on strengthening causal analysis and empathy through counseling and peer-mentoring programs. Furthermore, the significant role of economic stability implies a need for flexible academic policies and financial support systems tailored for working students to effectively mitigate the risk of attrition.

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1. INTRODUCTION

Student attrition remains a persistent and complex challenge in higher education systems worldwide, with significant academic, social, and economic implications. Recent global studies consistently identify dropout as a multidimensional phenomenon shaped by academic performance, financial constraints, institutional quality, and psychosocial factors (Aina, Baici, Casalone, & Pastore, 2022a, 2022b; Aulck, Velagapudi, Blumenstock, & West, 2017; Heublein, 2014; Vossensteyn et al., 2015). With the expansion of higher education systems, particularly in developing and emerging economies, concerns about student retention have intensified due to mismatches between access, preparedness, and institutional support. Furthermore, recent evidence highlights the increasing role of data-driven approaches, including machine learning and predictive analytics, in understanding and mitigating student attrition (Aulck et al., 2017; Mat et al., 2023). These studies emphasize that early identification of at-risk students is critical for improving retention outcomes and institutional effectiveness.

At the local level, the issue of student attrition is particularly relevant in developing countries such as Indonesia, where structural inequalities and resource disparities continue to affect student persistence. Contemporary research shows that socioeconomic status, prior academic achievement, and access to institutional support systems remain dominant predictors of student dropout (Aina et al., 2022a; Nurmalitasari, Awang Long, & Faizuddin Mohd Noor, 2023; Vossensteyn et al., 2015). Additionally, the transition period during the first year of higher education has been identified as a critical stage where students are most vulnerable to dropping out due to academic adjustment challenges and limited engagement (Heublein, 2014). The rapid digital transformation in education following the COVID-19 pandemic has further introduced new dimensions of attrition risk, including digital divide issues and reduced student engagement (Sweeney, Lester, Rangwala, & Johri, 2016).

Given these global and local dynamics, there is a growing need for robust analytical frameworks to better understand and mitigate student attrition. Recent literature advocates for integrative and data-driven approaches that combine academic, economic, and behavioral variables to model dropout risk more accurately (Aulck et al., 2017; Sweeney et al., 2016). In this context, advanced analytical methods such as predictive modeling, machine learning, and optimization-based approaches offer promising pathways for identifying at-risk students and designing targeted intervention strategies. Therefore, positioning student attrition research within both global developments and local contextual challenges is essential for generating effective, evidence-based solutions in higher education systems.

One of the indicators of assessing the quality of higher education is the success rate of student studies, the greater the percentage and speed of student study success in the college, it can be said that the college has good service quality (Biswas, Biswas, Pamucar, & Simic, 2025; Singh & Manohar, 2024). On the other hand, the low study success rate caused by the high number of student dropouts in a university indicates that the university needs to evaluate its governance in providing academic services, although it is not necessarily that student dropouts are caused by service satisfaction in higher education, but it can also be caused by problems from within the students themselves (Jacob, 2025), especially students who have low resilience or endurance to complete their educational tasks.

High student attrition is bad for universities both financially and reputationally (Crosling, Heagney, & Thomas, 2009) it is also a key performance indicator used by governments as evidence of university quality and is linked to university funding arrangements (Crosling et al., 2009) and indeed the problem of student attrition is an extraordinarily complex and multifaceted problem, which is difficult to address (Beer & Lawson, 2017). Understanding bad problems, such as student dropouts, is highly context-dependent, and research suggests that bad problems cannot be solved through a process of analysis (Rittel and Webber, 1973). Reduced student numbers with high dropout rates are an ongoing challenge for universities. Universities are concerned about the financial and reputational impacts associated with high student attrition, and continue to spend considerable time and resources addressing this issue (Beer & Lawson, 2017).

Researchers have conducted qualitative research on students who have dropped out of study in 2021 and 2022 to explore information on the causes of dropping out of study from the student's point

of view and the results show that 47.1% of the reasons for work are due to having time and distance between the place of work and the campus, considering that UNPAM students are approximately 60% of their students have worked before they graduate. Furthermore, 31.4% of the reasons are unable or caused by financial problems, 5.9% of health problems, and the rest are problems with administrative procedures, GPA, service dissatisfaction, and learning motivation.

Analysis based on these data, administratively the potential for students to drop out of studies can be predicted, with the information system developed, the potential for students to drop out of studies at UNPAM based on the Academic Information System can be seen, namely (1) who are applying for leave; (2) inactive student status; (3) have not made regular instalments of tuition payments; and (4) attendance in lectures that have decreased even below 75%. The four conditions of these students deserve to be considered as having a high potential to drop out of study if there is no appropriate treatment, but of course before doing this, researchers must conduct research with hypotheses from other variables that cause them to be administratively seen as having the potential to drop out of study.

Researchers in this case study examine how a student's endurance and ability to deal with academic stressors impact their risk of leaving their studies. This is reinforced by several previous studies that have similarities in solving similar problems where resilience variables are used to overcome several problems in educational institutions both schools and universities such as bullying problems, disaster mitigation, learning processes, and quality strengthening as part of the social capital that needs to be built independently by students who in this case are learners. Resilience itself is the ability to adapt to difficult situations in life, and as the ability to maintain and adapt positively and effectively as a strategy to overcome the difficulties faced (Luthar, 2006). The resilience is strongly related to emotion regulation and mental toughness (Strycharczyk & Clough, 2015) so that strong and resilient individuals can regulate emotions and cope with stress, pressure, and challenges effectively thus giving them the strength to survive and move in their profession or activities.

Previous research that is relevant to this research is (1) Role of High School on Creating Academic Resilience: Comparative Study of High School Students in Indonesia and Japan. *Journal: Advance Science Letters* (24) (Siti Irene Astuti Dwiningrum, Fauziah, Hidayah, & Suwarjo, 2018); (2) Student Resilience in Facing the Covid-19 Pandemic and its Implications for the Learning Process. *Indonesia Journal of Guidance and Counselling: Theory and Application*, Vol 9 No. 1 (Sari, Aryansah, & Sari, 2020); (3) School Resilience Policy Development and Strategic Steps to Disaster-resilient Communities. *IOP Conference Series: Earth and Environmental Science* 989 (S. I.A. Dwiningrum, Sitompul, Nisa, & Sumunar, 2022). (4) The problem of student attrition in higher education: An alternative perspective. *Journal of Further and Higher Education*, 41(6), 773-784 (Beer & Lawson, 2017). (5) An Approach to Reducing Student Attrition in the Accounting Study Program at Maranatha Christian University (Meyliana & Agustina, 2016).

The purpose of this study is to describe the resilience profile of students and get the results of the level of influence of student resilience on the potential for dropping out of study. Although numerous studies have been conducted on student success, this research fills several gaps in the literature identified. Theoretically, many recent studies (Maleeha Hammad, Samina Naseem, 2023; Price, 2023) still treat resilience as a single construct or global score, resulting in a lack of research that specifically examines the granular influence of the seven dimensions of resilience on attrition risk. Contextually, the majority of studies on non-traditional students still focus on developed countries (Najwa, Aprilia, Riamanda, & Puri, 2023; Salloum, Basiouni, Alfaisal, Salloum, & Shaalan, 2024). There remains a scarcity of empirical models exploring the interaction between economic stability and resilience among working students in developing countries such as Indonesia. Furthermore, methodologically, previous research has often employed a binary approach that merely distinguishes between retention and dropout (Nurmalitasari et al., 2023), whilst this study offers a novel approach by applying Structural Equation Modelling (SEM) to map the influence of resilience dimensions on more specific types of attrition, such as drop-out, opt-out, stop-out, and transfer-out, in order to provide higher predictive accuracy for institutional policy.

In light of this complex phenomenon of student attrition, this study was conducted to provide a deeper understanding of the role of resilience within the context of private higher education institutions, particularly in relation to students who are employed. The main objectives of this study are (1) to comprehensively map the resilience profiles of students at UNPAM through seven key dimensions, and (2) to analyse the extent to which these dimensions of resilience influence various forms of potential study discontinuation, including drop-out, opt-out, stop-out, and transfer-out.

This study makes an important contribution both theoretically and practically. Theoretically, it enriches the literature on the dynamics of resilience among working students in Indonesia, a demographic that often faces dual challenges between economic and academic demands. In practical terms, the findings of this study are expected to serve as a foundation for the management of UNPAM in designing strategic policies, such as psychological intervention programmes focused on strengthening causal analysis and empathy, as well as the development of a more adaptive financial support system to effectively reduce student attrition rates.

2. METHODS

2.1 Research design

This study uses quantitative research methods because the data and research analysis use numbers and statistics, where this study uses 2 variables, namely exogenous variables (X) or those that influence, namely Resilience, while endogenous variables (Y) or those that are influenced, namely the potential for dropping out of study (Student Attrition).

On the base Figure 1. X1 is Emotional Regulation, X2 is Impulse Control, X3 is Empathy, X4 is Optimism, X5 is Causal Analysis, X6 is Self-Efficacy, X7 is Reaching Out, Y1 is drop-outs, Y2 is stop-outs, Y3 is opt-outs, and Y4 is transfer-outs. Data analysis was carried out using SmartPLS.

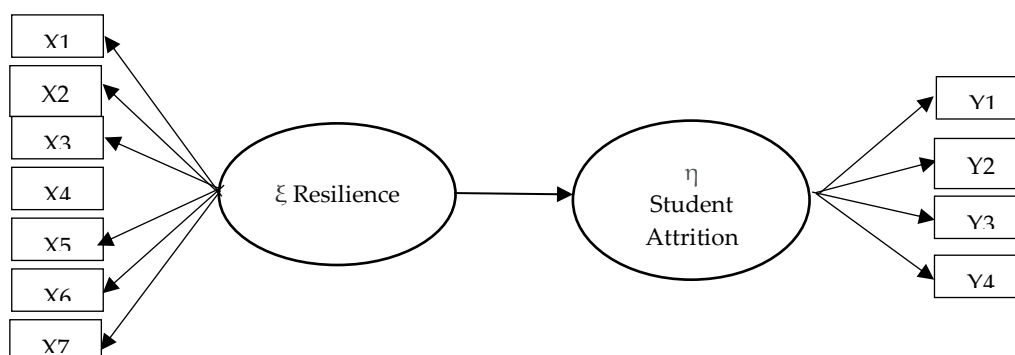


Figure 1. SEM Modelling of the Effect of Resilience on Student Attrition

Data analysis for the outer and inner models is below in Tables 1 and 2.

Table 1. Evaluation Criteria for the Outer Model

Criteria	Parameter	Threshold	Interpretation	Source
Indicator Reliability	Outer Loading	≥ 0.70	Highly satisfactory	(Hair, Sarstedt, Ringle, & Gudergan, 2024)
		0.60–0.70	Acceptable (exploratory research)	
Convergent Validity	AVE	< 0.40 ≥ 0.50	Should be removed Adequate validity	(Fornell & Larcker, 1981)
Internal Consistency	Composite Reliability (CR)	0.70 – 0.95	Reliable	(Hair et al., 2024)
		> 0.95	Indicates redundancy	(Hair et al., 2024)

Criteria	Parameter	Threshold	Interpretation	Source
Discriminant Validity	HTMT	< 0.90	Established validity	(Henseler, Ringle, & Sarstedt, 2014)
	< 0.85	More conservative threshold		Kline (2015)

Table 2. Evaluation Criteria for the Inner Model

Criteria	Parameter	Threshold	Interpretation	Source
Coefficient of Determination	R ²	0.75	Substantial	(Hair et al., 2024)
	0.50	Moderate		(Hair et al., 2024)
	0.25	Weak		(Hair et al., 2024)
Path Significance	t-statistic	> 1.96	Significant (α = 5%)	(Hair et al., 2024)
	p-value	< 0.05	Significant	(Hair et al., 2024)
Effect Size	f ²	0.02	Small	(Cohen, 2013)
	0.15	Medium		(Cohen, 2013)
	0.35	Large		(Cohen, 2013)
Predictive Relevance	Q ²	> 0	Model has predictive relevance	(Geisser, 1974; Stone, 1974)
Multicollinearity	VIF	< 5	No multicollinearity issue	(Hair et al., 2024)

2.2 Respondent

This study involves subjects, namely students in the even semester 2023/2024 who have the potential to drop out of study (Student Attrition) with the category of not paying the UTS fee, having Leave and Non-Active status, and pending status according to system data. So that based on the special academic guidance system (Sispendiksus) that has been developed previously, it is known that the total population of students used is 11,229 (monev.sasmitagroup.org: 10 June 2024) consisting of: (a) Have not paid the UTS fee: 4,052; (b) leave and inactive status: 3,727; and (c) pending status: 3.450. The sample withdrawal in the study was determined using the Lameshow, et al formula is equation (1) (Lameshow, Jr, Klar, & Lwanga, 1997).

$$n = \frac{Z_{1-\frac{\alpha}{2}}^2 \alpha P(1-P)N}{d^2(N-1) + Z_{1-\frac{\alpha}{2}}^2 \alpha P(1-P)N} \tag{1}$$

Where:

Z: Standard values of the normal distribution α=0.05 dengan CI 95% (1.96)

P: Incidence rate (5%)

d: The maximum acceptable absolute deviation (10%)

N: Population

n: Minimum sample size

Therefore, the minimum total sample size of students in this study is 387 respondents.

2.3 Instrument

The data collection technique used in the study was a questionnaire with a total of 56 items, before the validity test and reliability test of 56 items. The instrument grids are presented in Table 2. as follows.

Table 3. Lattice of Research Instruments

Variable	Indicator	Total of Item
Resiliensi	1) emotional regulation	4
	2) impulse control	4
	3) empathy	4
	4) optimism	4
	5) causal analysis	4
	6) self efficacy	4
	7) reaching out	4
	Total	28
Student attrition	1) drop-outs	7
	2) stop-outs	7
	3) opt-outs	7
	4) transfer-outs	7
	Total	28

If the calculated r is greater than the table r , the instrument is classified as valid; if the calculated r is less than the table r , the instrument is classified as invalid. Therefore, based on the results of calculations using product moment (r) for instrument validity testing presented in Table 3, 20 were found to be valid and 8 invalid, with a reference that the number of respondents for the trial was 50. In Table 4, 27 were found to be valid, and 1 was invalid, with a reference that the number of respondents for the trial was 50.

Table 3. Validity Test of the Resilience Instrument

Instrument	Rh	Rt	Rh > Rt	Conclusion
1	0.396375	0.278711	√	VALID
2	0.199578	0.278711	×	INVALID
3	0.128161	0.278711	×	INVALID
4	0.698392	0.278711	√	VALID
5	0.036471	0.278711	×	INVALID
6	0.282845	0.278711	√	VALID
7	0.560901	0.278711	√	VALID
8	0.433437	0.278711	√	VALID
9	0.195707	0.278711	√	INVALID
10	0.698571	0.278711	√	VALID
11	0.555468	0.278711	√	VALID
12	0.458439	0.278711	√	VALID
13	0.844431	0.278711	√	VALID
14	0.184206	0.278711	×	INVALID
15	0.660775	0.278711	√	VALID
16	0.72869	0.278711	√	VALID
17	0.40122	0.278711	√	VALID
18	0.033729	0.278711	×	INVALID
19	0.640899	0.278711	√	VALID
20	0.699056	0.278711	√	VALID
21	0.463323	0.278711	√	VALID
22	0.746387	0.278711	√	VALID
23	0.044446	0.278711	×	INVALID
24	0.558342	0.278711	√	VALID

25	-0.05638	0.278711	×	INVALID
26	0.544521	0.278711	√	VALID
27	0.317026	0.278711	√	VALID
28	0.699406	0.278711	√	VALID

Table 4. Validity Test of Instrument Student Attrition

Instrument	Rh	Rt	Rh > Rt	Conclusion
1	0.321744	0.278711	√	VALID
2	0.375234	0.278711	√	VALID
3	0.712794	0.278711	√	VALID
4	0.216311	0.278711	×	INVALID
5	0.713973	0.278711	√	VALID
6	0.536387	0.278711	√	VALID
7	0.607144	0.278711	√	VALID
8	0.649366	0.278711	√	VALID
9	0.508649	0.278711	√	VALID
10	0.302404	0.278711	√	VALID
11	0.55793	0.278711	√	VALID
12	0.582854	0.278711	√	VALID
13	0.475086	0.278711	√	VALID
14	0.43153	0.278711	√	VALID
15	0.470681	0.278711	√	VALID
16	0.530372	0.278711	√	VALID
17	0.74588	0.278711	√	VALID
18	0.677852	0.278711	√	VALID
19	0.562551	0.278711	√	VALID
20	0.591738	0.278711	√	VALID
21	0.579257	0.278711	√	VALID
22	0.690645	0.278711	√	VALID
23	0.737126	0.278711	√	VALID
24	0.67918	0.278711	√	VALID
25	0.59444	0.278711	√	VALID
26	0.430856	0.278711	√	VALID
27	0.706751	0.278711	√	VALID
28	0.659903	0.278711	√	VALID

The next stage is to test the reliability of both the resilience and student attrition instruments. it is obtained that all valid instruments are categorised as reliable for use in the next stage of research.

Table 5. Reliability Test with Cronbach's Alpha

X	TOTAL ITEM	20
	TOTAL VAR ITEM	29.33615646
	CRONBACH'S ALFA	0.907473476
	CONCLUSION	RELIABLE
Y	TOTAL ITEM	27
	TOTAL VAR ITEM	28.02938776
	CRONBACH'S ALFA	0.908625486
	CONCLUSION	RELIABLE

Based on Table 5, it can be concluded that there are 20 valid resilience instruments and 27 valid student attrition instruments after testing reliability with Cronbach's alpha values of 0.907473476 and 0.908625486. both of which are greater than 0.6. It can be concluded that the instruments can be used for the next stage of research.

3. FINDINGS AND DISCUSSION

3.1 The Resilience Profile

The resilience profile with a sample size of 387 respondents can be described based on regular, financing, employment status, income, resilience indicators, and dropping out of the study. Resilience groupings based on financing are presented in Table 6.

Table 6. Financing is presented

Type of Financing	Total	The percentage
Self	270	70%
Parents/Relatives	113	29%
Government Scholarships	1	0%
Company/ Workplace	3	1%

Table 6 shows the sources of funding used by respondents in the context of research on resilience. The data shows that the majority of respondents financed themselves (270 people or 70%). which indicates a high level of economic independence and can be one of the supporting aspects for the formation of resilience. In addition, 29% of respondents (113 people) received financial support from parents or relatives, which shows the role of family support networks in the process of continuing their education or activities. The source of funding from government scholarships was very low, with only 1 respondent (0%), while funding from companies or workplaces amounted to 3 respondents (1%). This condition confirms that dependence on external assistance is relatively small, and most respondents rely on personal or family capacity to support their financial needs.

The results of clustering based on employment status are presented in Table 7, as follows.

Table 7. The Employment status

Employment Status	Total	The percentage
Work	271	70%
Not Working	116	30%

Table 7 describes the employment status of respondents in the study on resilience. Based on the data, 271 respondents (70%) were employed, while 116 respondents (30%) were unemployed. The higher proportion of employed respondents indicates that most individuals have stable economic activities, which in many cases can be a supporting factor for resilience because employment provides access to income, routine structures, and problem-solving experiences. Meanwhile, the group of

unemployed respondents remains an important part of the resilience analysis. Economic instability can affect an individual's ability to cope with stress, but it can also open up opportunities for different adaptive mechanisms to emerge. Thus, this variation in employment status provides an important picture of the socio-economic context that can affect the level of resilience of respondents.

The results of the study, which obtained resilience profiles based on income, are presented in Table 8, as follows.

Table 8. Resilience profiles based on income

Income	Mean Resilience Score	Category
under IDR 3.000.000	73.99	Low
IDR3.000.000 up to IDR4.900.000	76.38	High
IDR5.000.000 up to IDR7.000.000	78.04	High
IDR7.100.000 up to IDR10.000.000	82.33	High
above IDR10.000.000	80.58	High

Table 8 presents the resilience profile based on the respondents' income level. The data shows a clear pattern that higher income tends to be associated with higher levels of resilience. The group with an income below IDR 3.000.000 has a mean resilience score of 73.99, which is categorized as low. It indicates that limited economic resources can impact an individual's ability to manage stress and recover from difficult situations.

Conversely, all groups with incomes above IDR 3.000.000 show high resilience with average scores increasing as income increases. Respondents with incomes of IDR 3.000.000–4.900.000 scored 76.38, while the IDR 5.000.000–7.000.000 group scored 78.04. The most significant increase was seen in the IDR 7.100.000–10.000.000 income group which achieved a score of 82.33—the highest value in the table. Even the group with an income above IDR 10.000.000 still showed high resilience with a score of 80.58.

These findings reinforce the understanding that financial stability is one of the external factors that supports the development of resilience, as individuals with greater economic resources tend to have greater access to social support, health services, educational opportunities, and a safer living environment. However, the fact that resilience remains high across all groups above the minimum income threshold also indicates that resilience is not solely determined by economic factors, but interacts with individuals' internal psychological capacity and social support.

The results of the study obtained a resilience profile based on the indicators on the instrument presented in Figure 1, with the highest being optimism and the lowest being causal analysis and empathy.

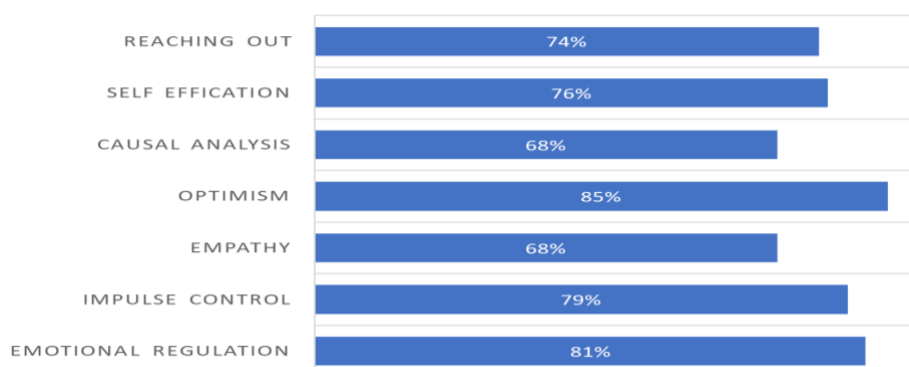


Figure 2. Resilience Profile Based on Indicators

Based on Figure 2, it shows the resilience profile of respondents based on seven dimensions. The highest score was in optimism (85%), followed by emotional regulation (81%) and impulse control (79%), which indicates a strong capacity to maintain a positive outlook, manage emotions, and control impulsive urges when facing stress. The dimensions of self-efficacy (76%) and reaching out (74%) are

also high, reflecting self-confidence and an adaptive tendency to seek external support. Meanwhile, causal analysis (68%) and empathy (68%) show relatively lower scores. It is Suggesting a need to strengthen analytical skills and interpersonal sensitivity. Overall, this profile depicts a solid resilience structure with several areas that can still be improved.

The results of the study obtained a resilience profile based on the indicator of dropping out of study on the instrument presented in Figure 3 with the highest being stop-outs and the lowest being stop-outs.

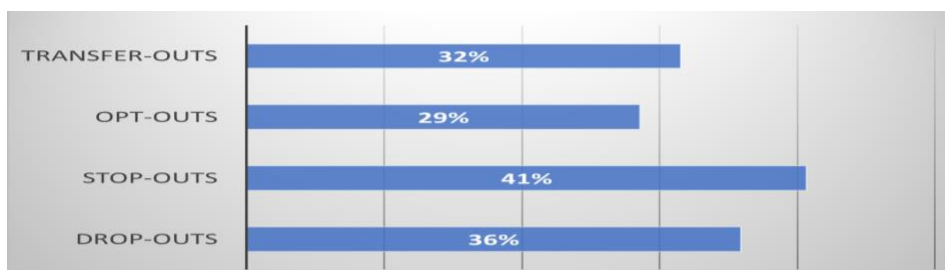


Figure 3. Resilience Profile Based on Dropout Indicators

Figure 3 shows the proportion of various forms of study discontinuation experienced by respondents. Stop-outs are the highest category (41%), followed by drop-outs (36%), transfer-outs (32%), and opt-outs (29%). The high proportion of stop-outs and drop-outs indicates significant challenges affecting study continuity, which may be closely related to individuals' resilience in facing academic, financial, and psychosocial pressures. Meanwhile, the lower rates of transfer-outs and opt-outs may reflect more deliberate decisions or adaptive strategies in seeking a more suitable learning environment. Overall, this pattern shows that variations in study continuity reflect differences in respondents' ability to manage obstacles and mobilize resources, which are important components of resilience.

3.2 The Path Analysis of Resilience of Potential Student Attrition

The results of the path analysis are presented in Figure 4.

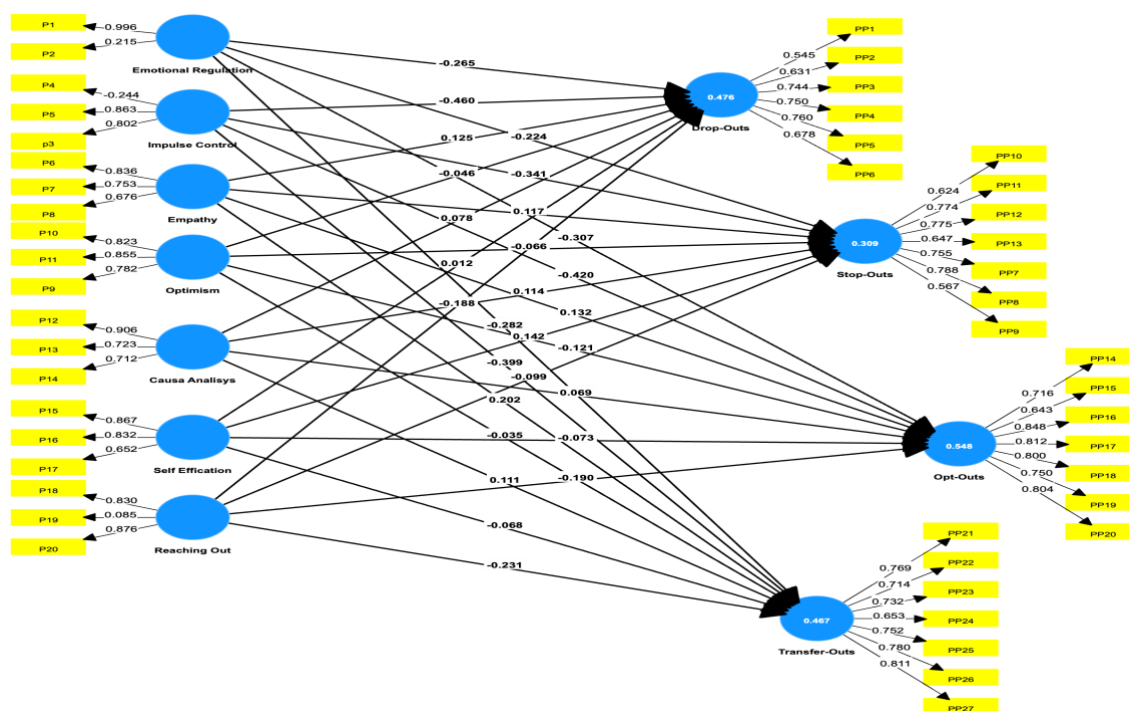


Figure 4. Path Coefficients

Based on Figure 4, the representation used in Table 9.

Table 9. Path Coefficients

Correlations	Path coefficients
<i>Causal Analysis -> Drop-Outs</i>	0.078
<i>Causal Analysis -> Opt-Outs</i>	0.069
<i>Causal Analysis -> Stop-Outs</i>	0.114
<i>Causal Analysis -> Transfer-Outs</i>	0.111
<i>Emotional Regulation -> Drop-Outs</i>	-0.265
<i>Emotional Regulation -> Opt-Outs</i>	-0.307
<i>Emotional Regulation -> Stop-Outs</i>	-0.224
<i>Emotional Regulation -> Transfer-Outs</i>	-0.282
<i>Empathy -> Drop-Outs</i>	0.125
<i>Empathy -> Opt-Outs</i>	0.132
<i>Empathy -> Stop-Outs</i>	0.117
<i>Empathy -> Transfer-Outs</i>	0.202
<i>Impulse Control -> Drop-Outs</i>	-0.460
<i>Impulse Control -> Opt-Outs</i>	-0.420
<i>Impulse Control -> Stop-Outs</i>	-0.341
<i>Impulse Control -> Transfer-Outs</i>	-0.399
<i>Optimism -> Drop-Outs</i>	-0.046
<i>Optimism -> Opt-Outs</i>	-0.121
<i>Optimism -> Stop-Outs</i>	-0.066
<i>Optimism -> Transfer-Outs</i>	-0.035
<i>Reaching Out -> Drop-Outs</i>	-0.188
<i>Reaching Out -> Opt-Outs</i>	-0.190
<i>Reaching Out -> Stop-Outs</i>	-0.099
<i>Reaching Out -> Transfer-Outs</i>	-0.231
<i>Self Effication -> Drop-Outs</i>	0.012
<i>Self Effication -> Opt-Outs</i>	-0.073
<i>Self Effication -> Stop-Outs</i>	0.142
<i>Self Effication -> Transfer-Outs</i>	-0.068

Based on Figure 4 and Table 9, the outer and inner models can be obtained as follows:

3.1.1. Outer Model (Measurement Model)

The measurement model was assessed by examining indicator loadings. Average Variance Extracted (AVE), and Composite Reliability (CR). Indicators with low loadings (P2, P4, and P19) were removed to improve model quality. The remaining indicators showed satisfactory loadings, with most exceeding the recommended threshold of 0.70, while a few (e.g., P8 and P17) were retained due to acceptable contributions to construct validity. The AVE values for all constructs ranged from 0.553 to 0.756, exceeding the minimum criterion of 0.50, thereby confirming adequate convergent validity. In addition, Composite Reliability values ranged from 0.787 to 0.862, indicating strong internal consistency reliability across all constructs. Overall, these results demonstrate that the measurement model is both valid and reliable, and thus suitable for further structural analysis.

3.1.2. Inner Model (Structural Model)

The structural model was evaluated using the coefficient of determination (R^2) and path coefficients. The R^2 values of the endogenous constructs were 0.476, 0.309, 0.548, and 0.467, indicating

moderate explanatory power of the model. These results suggest that the exogenous variables are able to explain a substantial proportion of variance in the endogenous constructs. The path coefficients revealed both positive and negative relationships among constructs, with several moderate to strong effects observed (e.g., -0.460 , -0.420 , and -0.399), indicating meaningful structural relationships. Positive coefficients (e.g. 0.125 , 0.132 , and 0.202) suggest direct relationships, although generally weaker in magnitude. Overall, the structural model demonstrates acceptable predictive capability, although further evaluation using bootstrapping (t-statistics and p-values) is recommended to confirm the significance of the hypothesized relationships.

Based on Figure 4 and Table 9, path coefficient analysis shows that Impulse Control has the strongest negative influence on all forms of study discontinuation. Coefficient values range from -0.341 to -0.460 , with the greatest impact on dropouts (-0.460) and opt-outs (-0.420). This confirms that a one-unit increase in impulse control ability is associated with a 34–46% decrease in the probability of study discontinuation.

The Emotional Regulation dimension also shows a consistent protective effect, with coefficients ranging from -0.224 to -0.307 . The greatest effect is found on opt-outs (-0.307), indicating that emotional regulation ability reduces the tendency to voluntarily drop out by 30.7%.

Conversely, Causal Analysis had small positive coefficients (0.069 – 0.114), suggesting that increased causal analysis ability correlated with a 6.9% to 11.4% increase in the probability of study discontinuation. The strongest relationships were seen in stop-outs (0.114) and transfer-outs (0.111).

The Empathy dimension also shows a positive pattern with coefficient values of 0.117 – 0.202 , where the greatest impact is found in transfer-outs (0.202). Quantitatively, each increase in empathy units correlates with a 20.2% increase in the probability of transfer-outs.

Meanwhile, Optimism shows a weak negative coefficient (-0.035 to -0.121), with the largest contribution to opt-outs (-0.121). Although the effect is small, optimistic tendencies still reduce the probability of discontinuing studies.

The Reaching Out dimension shows moderate negative coefficients (-0.099 to -0.231), with the strongest influence on transfer-outs (-0.231). This indicates that the tendency to seek help reduces the chance of transferring studies by up to 23.1%.

Self-Efficacy shows a mixed pattern, with coefficients ranging from -0.073 to 0.142 . Protective effects are seen in opt-outs (-0.073) and transfer-outs (-0.068), while the strongest positive relationship appears in stop-outs (0.142), which indicates a 14.2% increase in the likelihood of temporary withdrawal.

The results can be presented in a causality table shown in Table 10.

Table 10. Causal Analysis of Resilience Dimension

Resilience Dimension	Type of Discontinuity	Coefficient	Direction of Relationship	Effect Size	Interpretation
Causal Analysis	Drop-Outs	0.078	Positive	Weak	An increase in causal analysis capability slightly raises the likelihood of student drop-out.
	Opt-Outs	0.069	Positive	Weak	Higher levels of causal analytical skills tend to modestly encourage voluntary withdrawal decisions.
	Stop-Outs	0.114	Positive	Weak–Moderate	Stronger causal analysis is associated with a somewhat greater tendency to take temporary breaks.

Transfer-Outs	0.111	Positive	Weak– Moderate	Students with higher analytical capability show a modestly increased likelihood of transferring out.
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Overall, these quantitative results identify Impulse Control as the strongest protective factor, while Empathy and Causal Analysis are positive predictors of discontinuation of studies.

Discussion

The findings show that the Causal Analysis dimension has a positive relationship with all forms of study discontinuation, albeit with relatively weak to moderate effect sizes. The path coefficients for dropouts (0.078) and opt-outs (0.069) indicate that an increase in participants' ability to analyze the causes of problems actually slightly increases the tendency to permanently or voluntarily discontinue their studies. This pattern indicates that analytical ability does not always function as a protective factor in the context of study continuity. Individuals who are better able to identify sources of pressure, academic barriers, or learning environment incompatibilities are likely to make decisions to discontinue their studies more quickly when they assess that conditions no longer support the achievement of educational goals.

Furthermore, a stronger positive relationship was observed in stop-outs (0.114) and transfer-outs (0.111). Both values fall into the weak to moderate category, indicating that students with higher causal analysis skills tend to be more reflective in evaluating the suitability of their programs, personal circumstances, or academic strategies. The decision to stop out can be seen as a form of short-term adaptation to reduce pressure and recover before continuing education, while transfer-out is a structural adjustment strategy by moving to a program that is more suited to individual interests and capacities. Thus, these findings reinforce the assumption that Causal Analysis functions as an evaluative mechanism, not a direct protective mechanism in academic resilience.

From the perspective of resilience theory, these results explain that the ability to understand the causes of problems is not always synonymous with persistence or resilience in the context of education. On the contrary, individuals with high analytical capacity may assess that dropping out. Postponing or transferring studies is the most rational adaptive decision. These findings are also consistent with previous studies emphasizing that the dimension of resilience does not solely serve to maintain continuity, but also allows individuals to choose exit strategies (adaptive disengagement) when obstacles are deemed disproportionate to available resources.

Thus, the results of this study have important implications that improving analytical skills needs to be balanced with emotional support, academic guidance, and decision-making facilitation, so that students' analyses do not lead to unnecessary decisions to discontinue their studies. A holistic approach to developing resilience—including strengthening emotional regulation, social support, and impulse control—can help balance the role of Causal Analysis so that it functions adaptively in supporting the continuation of studies.

4 CONCLUSION

Research findings indicate that economic factors and psychological capacity play a significant role in shaping respondents' levels of resilience and study sustainability. The majority of respondents who work and those in higher income groups have stronger levels of resilience, confirming that financial stability supports individuals' adaptive abilities. The resilience profile shows strengths in optimism, emotional regulation, and impulse control, while causal analysis and empathy are at lower levels, indicating areas that need strengthening. Variations in the forms of study discontinuity, with a predominance of stop-outs and drop-outs, confirm the existence of academic and socioeconomic pressures that affect study continuity. Path coefficient analysis identified impulse control as the strongest protective factor against discontinuation of studies, while empathy and causal analysis were positive predictors of the likelihood of dropping out. Overall, these results confirm that resilience is a

multidimensional construct influenced by internal and external factors and has a direct relationship with educational continuity. These findings are important as a basis for developing interventions to increase resilience in higher education settings.

Acknowledgments: This research was supported by the Institute for Research and Community Service of Pamulang University, contract number 0388/D5/SPKP/LPPM/UNPAM/IX/2024, with the research title namely "Pengaruh Resiliensi Terhadap Potensi Mahasiswa Putus Studi (Student Attrition) di Universitas Pamulang (Unpam)".

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