



Academic ecosystem and change management effects on learning service quality in higher education

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Abstract. The increasing demand for high-quality learning services in higher education is often not matched by institutional readiness to develop supportive academic ecosystems and manage change effectively, creating a gap between student expectations and actual service quality. This study examines the effects of the academic ecosystem and change management on learning service quality at the postgraduate level in response to the growing expectation that universities function as service-oriented institutions. A quantitative survey was conducted involving all 95 postgraduate students enrolled in the Educational Administration Study Program, Faculty of Education, Universitas Pendidikan Indonesia. Given the relatively small population, a census sampling technique was employed, with all students included as respondents. Data were collected through questionnaires and analyzed using multiple linear regression after meeting the classical assumption tests. The results indicate that the academic ecosystem and change management have positive and significant effects on

learning service quality, both simultaneously and partially, with a combined contribution of 49.9%. The academic ecosystem exerts a stronger influence ($\beta = 0.479$) than change management ($\beta = 0.327$). These findings suggest that strengthening academic ecosystems and implementing sustainable change management are essential for improving learning service quality and enhancing institutional competitiveness in higher education.

Introduction

In the era of globalization and digital disruption, higher education institutions face increasingly complex competition and dynamic stakeholder demands (Bagga et al., 2023; Ramadhan et al., 2023; Ridwan & Astuti, 2025; Rizkiyah, 2025). Universities are no longer viewed solely as educational institutions but also as service providers expected to produce adaptive and competitive graduates. Consequently, the quality of learning services has become an important indicator of institutional performance and competitiveness (Arina et al., 2023; Lukita et al., 2020). At the postgraduate level, demands for high-quality learning services are even greater because students have higher academic maturity and expectations regarding learning processes, academic services, and scholarly environments that support research and innovation (Chen et al., 2023; Sari et al., 2025; Shaari & J Rees, 2025). Failure to meet these expectations may reduce student satisfaction, institutional reputation, and competitiveness (Hussain & Maharvi, 2024; Ramovš & Milfelner, 2023; Subekhan et al., 2025).

Learning service quality refers to the extent to which educational services fulfill students' needs and expectations effectively (Dangaiso et al., 2022; Masyita, 2020). The SERVQUAL model, which includes tangibles, reliability, responsiveness, assurance, and empathy, has been widely used to assess service quality and student satisfaction in higher education (Leoparjo et al., 2023; Prima et al., 2025; Sumi & Kabir, 2021). Previous studies have shown that service quality significantly influences student satisfaction, loyalty, and institutional reputation (Cao, 2023; Fakhrudin et al., 2025; Luthfiana et al., 2025; Qasem & Bahafi, 2024). However, learning service quality is not limited to administrative or technical aspects but also involves the quality of the academic environment that supports learning interactions and academic development (Lukita et al., 2020).

One important factor influencing learning service quality is the academic ecosystem. The academic ecosystem refers to interactions among lecturers, students, researchers, administrative staff, and institutional partners that encourage collaboration, innovation, and knowledge development (Cai et al., 2020; Lenart & Sulkowski, 2025; Marra, 2023). A conducive academic ecosystem contributes to productive academic culture, scientific collaboration, and improved learning quality (Cai et al., 2020; Do Hong et al., 2023; Hermawan et al., 2025). In postgraduate education, this ecosystem becomes increasingly important because learning activities are closely related to research, scholarly discussion, and interdisciplinary collaboration (Craig et al., 2025; Newman, 2024; Ramachandran et al., 2024).

In addition, learning service quality is strongly influenced by institutions' ability to manage organizational change effectively (Widana et al., 2019). Technological developments, policy transformation, and increasing expectations regarding graduate quality require universities to continuously adapt their academic governance (Fatmawati et al., 2024; Fernández et al., 2023; Singun, 2025). Change management serves as a structured approach for managing organizational transformation and fostering readiness for change within academic communities (Ramadhan et al., 2023; Rosnaeni et al., 2024; Widodo et al., 2024; Yahya et al., 2023). Effective change management also helps institutions minimize resistance to innovation and strengthen organizational adaptability. The success of this process is closely related to leadership quality, particularly transformational and visionary leadership that promotes collaboration and collective commitment toward institutional goals (Bagga et al., 2023; Fakhrudin et al., 2025; Fernández et al., 2023; Kabuam & Nathan, 2024).

Although many studies have examined service quality in higher education, most have focused primarily on student satisfaction or individual service dimensions in isolation (Alfianto & Suryawardana, 2021; Bwachele et al., 2023; Subekhan et al., 2025; Tran et al., 2022). Limited attention has been paid to understanding how the academic ecosystem and change management jointly influence the quality of learning services, particularly in postgraduate education. This gap indicates the need for a more integrated perspective in explaining learning service quality. The novelty of this study lies in its integrated examination of these two dimensions within a single analytical framework. Unlike previous studies that have tended to investigate organizational and academic factors separately, this study explores their combined effects on learning service quality among postgraduate students. By doing so, it extends the existing literature and offers a more comprehensive explanation of the mechanisms through which institutional environments and adaptive management practices contribute to the enhancement of higher education services.

In this context, the Educational Administration Study Program at the Faculty of Education, Universitas Pendidikan Indonesia, is required to provide adaptive, quality-oriented learning services that support students' academic and professional development. Therefore, strengthening the academic ecosystem and implementing effective change management are essential in supporting quality learning processes for postgraduate students. Based on this background, this study aims to

analyze the effects of academic ecosystem and change management on learning service quality among postgraduate students in the Educational Administration Study Program, Faculty of Education, Universitas Pendidikan Indonesia. The findings are expected to contribute to the development of more adaptive, collaborative, and quality-oriented academic service systems in higher education.

Method

Research Method and Design

This study employs a quantitative approach with a correlational survey design to analyze the effects of academic ecosystem and change management on learning service quality among postgraduate students. A quantitative approach was selected because the study focuses on measuring relationships among variables using numerical data analyzed through statistical techniques (Creswell & Creswell, 2023). The study involved academic ecosystem (X1) and change management (X2) as independent variables, and learning service quality (Y) as the dependent variable.

Population and Sample

The population of this study consisted of all postgraduate students enrolled in the Educational Administration Study Program, Faculty of Education, Universitas Pendidikan Indonesia, Indonesia. The total population comprised 95 students who were actively participating in the learning process during the research period. Since the population size was relatively small, all members of the population were included as respondents, resulting in a total sample of 95 postgraduate students.

Sampling Technique and Sample Selection Criteria

This study applied a total sampling technique, in which all members of the population were selected as participants. The sample selection criteria included: (1) postgraduate students who were officially registered in the Educational Administration Study Program, (2) students who actively participated in academic activities during the research period, and (3) students who were willing to complete the research questionnaire.

Research Location and Duration

The research was conducted at the Educational Administration Study Program, Faculty of Education, Universitas Pendidikan Indonesia, Indonesia. The study was carried out during the academic semester in which respondents were actively engaged in learning activities and academic services.

Research Procedures

The research procedures consisted of several stages, including identifying the research problem and developing the conceptual framework, developing and testing the validity and reliability of the instruments, distributing questionnaires to postgraduate students as respondents, and processing and analyzing the collected data using descriptive and inferential statistical techniques using SPSS software to examine the relationships and effects among the research variables.

Data Collection Techniques and Research Instruments

Data were collected through questionnaires distributed to postgraduate students. The research instrument employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), developed based on theoretical indicators for each variable (Rokeman, 2024). The research instrument blueprint is presented in Table 1.

Table 1. Instrument Blueprint

Variable	Indicator	Operational Definition	Items
Academic Ecosystem	Academic Interaction	The intensity of academic communication between lecturers and students	1, 2, 3
	Academic Collaboration	Collaboration in academic and research activities	4, 5, 6
	Academic Culture	An environment that encourages scientific discussion and critical thinking	7, 8, 9
	Institutional Support	Study program support for academic activities	10, 11, 12
	Access to Learning Resources	Availability of academic facilities and resources	13, 14, 15
Change Management	Appropriateness of Change	Perception that change is necessary	16, 17
	Management Support	Leadership support for change	18, 19, 20
	Change Efficacy	Confidence in the ability to implement change	21, 22, 23
	Personal Valence	Perceived personal benefits of change	24, 25, 26
Learning Service Quality	Tangibles	Physical facilities and learning infrastructure	27, 28, 29
	Reliability	Reliability of academic services	30, 31, 32
	Responsiveness	Responsiveness to student needs	33, 34, 35
	Assurance	Competence and trust in services	36, 37, 38
	Empathy	Attention to student needs	39, 40

Validity and Reliability of Instruments

Prior to the main data collection, the research instrument was tested for validity and reliability. Item validity was assessed using Pearson product-moment correlation, while reliability was measured using Cronbach's alpha coefficient to evaluate internal consistency (Anggraini et al., 2023; Guntoro et al., 2024). The results of the validity test are presented in Table 2, while the reliability results are presented in Table 3.

Table 2. Summary of Instrument Validity Results

Variable	Number of Items	Minimum r	Maximum r	Validity Status
Academic Ecosystem	15	0.383	0.798	Valid
Change Management	11	0.583	0.851	Valid
Learning Service Quality	14	0.653	0.822	Valid

Note: All r-values exceed the critical value (0.361), indicating that all items are valid.

Table 3. Instrument Reliability Test Results

Variable	Number of Items	Cronbach's Alpha	Interpretation
Academic Ecosystem	15	0.920	Reliable
Change Management	11	0.932	Reliable
Learning Service Quality	14	0.958	Reliable

Note: All variables demonstrate high reliability ($\alpha > 0.70$)

Data Analysis Techniques

The collected data were analyzed using descriptive and inferential statistical methods using SPSS software. Descriptive analysis was used to characterize the data and respondents' perceptions. Multiple linear regression analysis was conducted to examine the effects of academic ecosystem and change management on learning service quality. The results are presented in tables along with statistical interpretations to explain the effect of each independent variable on the dependent variable.

Results and Discussion

Results

This section presents the results of the data analysis, including respondents' demographic characteristics, classical assumption tests, and a multiple linear regression analysis examining the effects of the academic ecosystem and change management on learning service quality among postgraduate students in the Educational Administration Study Program, Faculty of Education, Universitas Pendidikan Indonesia.

Respondents' Demographic Characteristics

The respondents' demographic characteristics in this study include gender and educational level. The presentation of demographic data provides a general overview of the respondents' backgrounds as a basis for interpreting the analysis results. The demographic characteristics are presented in Table 4.

Table 4. Respondents' Demographic Characteristics

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	51	53.7
	Female	44	46.3
Education Level	Master's (S2)	59	62.1
	Doctoral (S3)	36	37.9

Based on Table 4, the distribution of respondents by gender shows that the majority are male (51 respondents; 53.7%), while female respondents account for 44 respondents (46.3%). This indicates a relatively balanced composition between male and female respondents, thereby minimizing potential gender bias in the study findings. In terms of educational level, most respondents are enrolled in the master's program (S2), totaling 59 respondents (62.1%), while doctoral (S3) students account for 36 respondents (37.9%). The dominance of master's students suggests that a larger proportion of respondents are in the earlier stage of postgraduate education. Overall, the demographic distribution reflects that the respondents possess relatively high and diverse educational backgrounds. This enhances the relevance and representativeness of the data for analyzing learning service quality in postgraduate education.

Normality Test

The normality test aims to determine whether the data in this study are normally distributed, which is one of the key assumptions in linear regression analysis. In this study, normality was tested using

the Kolmogorov–Smirnov method. The selection of this test was based on the relatively large sample size ($N = 95$), as the Kolmogorov–Smirnov test is generally more appropriate than the Shapiro–Wilk test, which is typically used for smaller samples ($N < 50$). In addition, the Kolmogorov–Smirnov test assesses the overall conformity between the data distribution and a normal distribution. The results of the normality test are presented in Table 5.

Table 5. Results of the Normality Test (Kolmogorov-Smirnov)

Variable	N	Sig. (Asymp.)	Criteria (Sig > 0.05)	Interpretation
Academic Ecosystem	95	0.200	Meets the criterion	Normally distributed
Change Management	95	0.099	Meets the criterion	Normally distributed
Learning Service Quality	95	0.091	Meets the criterion	Normally distributed

Based on Table 5, the significance values (Asymp. Sig.) for academic ecosystem, change management, and learning service quality are 0.200, 0.099, and 0.091, respectively. All significance values exceed 0.05, indicating that there is no significant deviation from normality. Therefore, all variables in this study are normally distributed, and the assumption of normality required for further regression analysis has been satisfied.

Multicollinearity Test

The multicollinearity test was conducted to identify the presence of high linear relationships among independent variables in the regression model. The existence of multicollinearity may lead to instability in regression coefficient estimation and complicate model interpretation. Therefore, a properly specified regression model should not exhibit multicollinearity. The results of the multicollinearity test are presented in Table 6.

Table 6. Results of the Multicollinearity Test

Variable	Tolerance	VIF	Criteria (Tolerance > 0.10; VIF < 10)	Interpretation
Academic Ecosystem	0.690	1.449	Meets the criterion	No multicollinearity detected
Change Management	0.690	1.449	Meets the criterion	No multicollinearity detected

Dependent Variable: Learning Service Quality

Based on Table 6, the tolerance values for both independent variables are 0.690, exceeding the minimum threshold of 0.10. Similarly, the Variance Inflation Factor (VIF) values are 1.449, which are below the maximum threshold of 10. These results indicate the absence of multicollinearity among the independent variables. Therefore, the regression model is free from multicollinearity. This finding reinforces that the independent variables, namely academic ecosystem and change management, contribute independently to explaining variations in the dependent variable.

Heteroscedasticity Test

The heteroscedasticity test aims to examine whether the variance of residuals is constant in the regression model. A good regression model assumes constant variance of residuals (homoscedasticity). In this study, the Glejser test was used to detect heteroscedasticity. The results of the heteroscedasticity test are presented in Table 7.

Table 7. Results of the Heteroscedasticity Test (Glejser Test)

Variable	Sig.	Criteria (Sig. > 0.05)	Interpretation
Academic Ecosystem	0.579	Meets the criterion	No multicollinearity detected
Change Management	0.184	Meets the criterion	No multicollinearity detected

Dependent Variable: Learning Service Quality

Based on Table 7, the significance values for academic ecosystem and change management are 0.579 and 0.184, respectively. Both values exceed 0.05, indicating that there is no significant relationship between the independent variables and the absolute residuals. This suggests that the residuals are randomly distributed and that no heteroscedasticity is present in the regression model. Conceptually, this condition indicates that the model has good reliability in predicting the dependent variable, as there is no variance bias that could distort estimation accuracy.

Coefficient of Determination

The coefficient of determination measures the extent to which the independent variables explain the variation in the dependent variable. The results are presented in Table 8.

Table 8. Model Summary (Coefficient of Determination)

R	R Square	Adjusted R Square	Std. Error
0.714	0.510	0.499	4.182

Predictors: (Constant), Change Management, Academic Ecosystem

Based on Table 8, the R-squared value is 0.510, and the Adjusted R-squared value is 0.499. This indicates that the independent variables, namely academic ecosystem and change management, collectively explain 49.9% of the variance in learning service quality. The remaining 50.1% is influenced by other variables not included in the model.

Simultaneous Test (F-Test)

The simultaneous test (F-test) was conducted to determine whether all independent variables collectively have a significant effect on the dependent variable. The results of the simultaneous test examining the effect of academic ecosystem and change management on learning service quality are presented in Table 9.

Table 9. Results of the Simultaneous Test (F-Test)

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1674.402	2	837.201	47.854	0.000
Residual	1609.535	92	17.495		
Total	3283.937	94			

Dependent Variable: Learning Service Quality

Predictors: (Constant), Change Management, Academic Ecosystem

Based on Table 9, the calculated F-value is 47.854 with a significance value of 0.000 (< 0.05). This result indicates that the academic ecosystem and change management simultaneously have a significant effect on learning service quality. These findings demonstrate that the combination of the two independent variables is an important factor in improving learning service quality.

Multiple Linear Regression Analysis (t-Test)

Multiple linear regression analysis was conducted to examine the direction and magnitude of the effect of each independent variable on the dependent variable. The results are presented in Table 10.

Table 10. Results of Multiple Linear Regression Analysis

Variable	B	Std. Error	Beta	t	Sig.	Interpretation
(Constant)	5.279	5.641	-	0.936	0.352	
Academic Ecosystem	0.512	0.094	0.479	5,449	0.000	Significant
Change Management	0.469	0.126	0.327	3.718	0.000	Significant

Dependent Variable: Learning Service Quality

Based on Table 10, the regression equation can be formulated as follows: $Y = 5.279 + 0.512X_1 + 0.469X_2$. This equation indicates that when all independent variables are held constant at zero, the value of the dependent variable (learning service quality) is 5.279. The regression coefficient for the academic ecosystem variable (0.512) shows that a one-unit increase in the academic ecosystem will increase learning service quality by 0.512 units, assuming other variables remain constant. Similarly, the regression coefficient for change management (0.469) indicates that a one-unit increase in change management will increase learning service quality by 0.469 units.

The significance values for both independent variables are 0.000 ($p < 0.05$), indicating that both academic ecosystem and change management have a statistically significant partial effect on learning service quality. Furthermore, the standardized coefficients (Beta) indicate that the academic ecosystem ($\beta = 0.479$) has a stronger influence than change management ($\beta = 0.327$). This suggests that learning service quality is more sensitive to changes in the academic ecosystem than to change management.

Discussion

The findings of this study provide empirical evidence that learning service quality among postgraduate students in the Educational Administration Study Program, Faculty of Education, Universitas Pendidikan Indonesia (UPI), is influenced by the synergy between the academic ecosystem and change management. The multiple linear regression analysis demonstrates that improvements in both variables contribute positively and significantly to the enhancement of learning service quality. These findings also reflect the transformation of higher education institutions from traditional knowledge providers into service-oriented institutions that must be strategically managed to meet stakeholder expectations, particularly those of students (Rahman & Nasrin, 2024; Sahin et al., 2024; Widana et al., 2020). The simultaneous test results ($F = 47.854$; $p = 0.000$) further confirm that academic ecosystem and change management function as complementary determinants in improving institutional service performance.

The academic ecosystem shows a more dominant influence ($\beta = 0.479$), indicating that postgraduate students are highly influenced by the academic environment they experience directly. In this study, the academic ecosystem is not merely about physical facilities but also about the interactions among lecturers, students, institutions, and academic resources that support learning and research activities (Lenart & Sulkowski, 2025). This finding aligns with previous studies emphasizing that a well-managed academic ecosystem, including learning environments, technological support, and instructional interaction, significantly affects service quality and student learning outcomes because it strengthens learning effectiveness and student satisfaction (Bojórquez-roque et al., 2024; Mohammed et al., 2024). In postgraduate education, this ecosystem becomes particularly important through the quality of lecturer–student interaction, the availability of research facilities, and the existence of a supportive academic culture that encourages scientific literacy and scholarly productivity (Agustin & Fithriyah, 2025). These findings also support the perspective of Service Dominant Logic, which explains that educational value is created

collaboratively between institutions and students through continuous interaction and co-creation processes (Zamora-Ramos et al., 2023). In practice, postgraduate students tend to assess learning service quality based on how far the academic ecosystem supports research progress, access to digital resources, and the development of systematic academic writing culture (Diao et al., 2026; Walidayni et al., 2023).

Beyond its significant effect, the academic ecosystem was found to exert a stronger influence on learning service quality than change management. This finding differs from several previous studies that identified service quality dimensions, organizational commitment, job satisfaction, reliability, perceived transparency, and trust as the primary determinants of educational service quality and student satisfaction (Al-Refaei et al., 2022). However, some previous studies reported inconsistent findings, showing that academic-related environmental factors do not always have a significant direct effect on service quality and may instead operate through mediating variables such as student satisfaction or institutional trust. Recent reviews have also highlighted the diversity of factors influencing service quality across higher education contexts, suggesting that the determinants of service quality may vary according to institutional characteristics and stakeholder perspectives (Toscano-Hernández et al., 2024). The stronger role of the academic ecosystem in the present study may be attributed to the postgraduate context, where research support, scholarly interaction, and academic culture are central to students' learning experiences. Therefore, this study offers a novel empirical contribution by demonstrating the dominant role of the academic ecosystem over change management in postgraduate education.

Meanwhile, change management also demonstrates a positive and significant contribution to learning service quality, although its influence is lower than that of the academic ecosystem ($\beta = 0.327$). This finding indicates that service quality is shaped not only by stable academic conditions but also by the institution's capacity to respond adaptively to ongoing changes. In higher education, change management involves organizational transformation, improvement of administrative systems, and strategic responses to challenges such as digitalization, globalization, and increasing demands for accountability (Dahlia et al., 2025; Rosnaeni et al., 2024). The success of the Educational Administration Study Program at UPI in managing change is closely related to adaptive leadership that fosters collaboration and innovation (Kabuum & Nathan, 2024). Digital leadership competence is therefore essential, as institutional leaders are required to integrate technology into academic governance to improve efficiency, transparency, and student learning experiences (Harini et al., 2024; Obied, 2025; Ricarti-villagrán et al., 2026). Conversely, ineffective change management, such as resistance to digital transformation and bureaucratic inefficiency, may reduce students' perceptions of service quality (Kasirun et al., 2025). Continuous Quality Improvement through feedback-based evaluation is therefore essential to ensure sustainable service enhancement (Abnoulgid et al., 2025; Amiri et al., 2025). Previous studies also confirm that effective change management strengthens institutional performance and accelerates adaptation to educational change (Shraih et al., 2026; Umar et al., 2025; Hanafiah et al., 2023).

From a theoretical perspective, this study contributes to the higher education service quality literature by confirming that the academic ecosystem and change management function as complementary determinants in explaining learning service quality within a single analytical framework. Recent studies highlight that service quality in higher education is a multidimensional and context-dependent construct influenced by various institutional and environmental factors (Toscano-Hernández et al., 2024). Higher education institutions are increasingly conceptualized as integrated service ecosystems where academic, organizational, and stakeholder components interact to shape educational quality (Bao et al., 2024). Empirical evidence further shows that learning environment conditions and institutional management practices significantly affect student satisfaction and perceived service quality outcomes (Rahman & Nasrin, 2024). Practically, the

findings suggest that higher education institutions should strengthen academic ecosystems, enhance research and learning support systems, and develop adaptive governance practices to improve learning service quality and institutional competitiveness.

More broadly, the findings indicate that the integration of a supportive academic ecosystem and responsive change management can strengthen service quality across SERVQUAL dimensions, including reliability, responsiveness, assurance, empathy, and tangibles (Buditjahjanto, 2020; Diao et al., 2026). This synergy not only improves learning service quality in the short term but also contributes to student loyalty and positive institutional reputation in the long term (Subekhan et al., 2025; Suriadi et al., 2025). Therefore, strengthening academic ecosystems, particularly through research infrastructure and academic culture, alongside the development of change management capacity based on digital leadership, should be viewed not only as an operational necessity but also as a strategic effort to build competitiveness in higher education (Olabiyi et al., 2025; Onan, 2024). In this regard, the Educational Administration Study Program at UPI needs to continuously strengthen stakeholder collaboration and develop more adaptive academic governance in order to maintain sustainable and quality-oriented learning services amid the evolving challenges of higher education.

Conclusion

This study concludes that the academic ecosystem and change management have positive and significant effects on learning service quality among postgraduate students in the Educational Administration Study Program, Faculty of Education, Universitas Pendidikan Indonesia, both simultaneously and partially. The findings indicate that the academic ecosystem exerts a more dominant influence, highlighting the importance of a conducive academic environment in supporting scholarly interaction, research activities, and productive learning processes. Meanwhile, change management contributes significantly to maintaining adaptive and responsive learning services amid the evolving dynamics of higher education. These findings demonstrate that improving learning service quality requires an integrative approach that combines the strengthening of academic ecosystems with the effective implementation of change management. Therefore, higher education institutions should prioritize policies that foster collaborative academic environments, strengthen research and learning support systems, and enhance institutional adaptability to change. From a theoretical perspective, this study contributes to the literature by demonstrating the complementary roles of the academic ecosystem and change management in shaping learning service quality. Future research should examine these relationships across different higher education contexts and incorporate additional variables that may influence learning service quality.

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