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Organizational Culture, Leadership, and Communication as Predictors of Lecturer Productivity in Pesantren-Based Institutions

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ABSTRACT

Lecturer productivity in Indonesia's pesantren-based private Islamic higher education institutions remains constrained by structural and motivational barriers, particularly in research output, community service, and time management. This study examined the direct effects of organizational culture, servant leadership, interpersonal communication, and achievement motivation on lecturer productivity, and the indirect effects of the first three variables on productivity through achievement motivation as a mediating variable. A quantitative survey was conducted among 105 lecturers, proportionally sampled from 142 permanent faculty across five pesantren-based institutions under Kopertais Region I, Jakarta and Banten. Data were analyzed using path analysis across two structural equations, supported by the Scientific Identification Theory to Conduct Operation Research in Education Management (SITOREM) to identify improvement priorities at the indicator level. All ten hypothesized paths were statistically significant. Interpersonal communication showed the strongest total effect on productivity among the three exogenous variables, driven largely by its strong direct effect on achievement motivation, which itself was the single strongest direct predictor of productivity. Achievement motivation partially mediated all three indirect relationships. The SITOREM diagnostic identified scientific publication, community service, and time management as the productivity indicators most urgently requiring institutional attention, while teaching performance and technology utilization were already sufficiently strong to maintain. These findings indicate that strengthening lecturer productivity in pesantren-based institutions requires coordinated investment across organizational, leadership, relational, and motivational dimensions rather than isolated reform, with interpersonal communication and achievement motivation representing the most influential pathways for institutional intervention.

Keywords: Achievement Motivation, Interpersonal Communication, Lecturer Productivity, Organizational Culture, Servant Leadership

INTRODUCTION

Pesantren-based higher education institutions occupy a distinctive position within Indonesia's Islamic education system, integrating the traditional values and governance structures of the pesantren, such as the centrality of the kyai and the mosque as the hub of institutional life, with the academic infrastructure of a modern university (Haryanto et al., 2025; Muslim et al., 2024). This model produces graduates who are expected to combine disciplinary competence with religious character, and it positions the lecturer, commonly referred to in this context as a “student-scholar” figure, as the primary agent responsible for translating that dual mission into measurable academic output (Ardiansyah & Basuki, 2023; Supriyandi et al., 2025). As the demand for globally competitive graduates intensifies, pesantren-based institutions face growing pressure to demonstrate that this integrated model can also sustain the research, teaching, and community service performance expected of contemporary higher education.

Private Islamic religious higher education institutions (PTKIS) form a substantial share of this landscape. As of 2024, no PTKIS in Indonesia had attained the highest institutional accreditation tier, in contrast to thirteen state Islamic higher education institutions that had already done so, a gap the Directorate of Islamic Higher Education attributes to persistently weak institutional governance, low lecturer certification, and limited research funding (Fadhli et al., 2023). Within Kopertais Region I, which oversees dozens of private Islamic higher education institutions across Jakarta and Banten, campus-level records confirm that pesantren-based institutions in the region are accredited predominantly at the B and C tiers rather than the highest tier, and that a substantial proportion of their lecturers have not yet attained a formal academic rank, underscoring the scale of the productivity gap this study addresses (KOPERTAIS, 2025).

To confirm that this gap was not merely a matter of institutional accreditation status but also reflected in day-to-day lecturer performance, a preliminary questionnaire on productivity indicators was administered in 2025 to 30 lecturers at pesantren-based PTKIS institutions within Kopertais Region I. Respondents reported the largest shortfall in time management, with 54 percent indicating this indicator had not yet been achieved, followed by teaching performance at 40 percent, technology utilization at 38 percent, scientific publication at 31 percent, and community service at 30 percent. Contrary to the assumption that classroom delivery is where pesantren-based lecturers struggle least, teaching performance ranked among the weaker indicators in this preliminary data, while community service and scientific publication, though still requiring attention, showed comparatively smaller gaps. This pattern points toward self-management and instructional practice as pressing concerns alongside the research and service dimensions more commonly emphasized in the productivity literature, and it

motivated the broader organizational and motivational explanation this study pursues.

A growing body of empirical research links organizational culture, leadership style, and communication quality to lecturer productivity, and read together this literature converges on a single underlying pattern rather than three separate stories. Governance structures built on shared values, clear commitment mechanisms, and participatory leadership strengthen lecturer performance in Indonesian higher education settings generally (Hidayat et al., 2023), and this same logic holds specifically for productivity in pesantren-based contexts, where a mixed-methods study of Islamic elementary school teachers found that academic supervision, itself an expression of organizational support and leadership quality, was the strongest predictor of productivity, explaining 41 percent of its variance on its own (Anawati et al., 2025). Servant leadership, a style defined by prioritizing the growth and needs of followers ahead of positional authority, extends this pattern by working partly through the follower's internal state, enhancing task performance both directly and by strengthening intrinsic motivation and supervisor relationship quality (Andriansyah et al., 2024; Zada et al., 2024). A quantitative study of lecturers at Islamic higher education institutions makes the connection between these organizational and motivational pathways explicit, finding that achievement needs, organizational culture, work ethic, and work motivation jointly determine lecturer productivity rather than acting as independent, unrelated levers (Fauzi et al., 2024). Across these studies, organizational culture, leadership style, and communication quality do not appear to influence productivity as isolated inputs; instead, each appears to operate substantially through the lecturer's internal motivational state, which is the premise this study tests directly.

Despite this convergence, achievement motivation, understood as the internal drive to meet or exceed a standard of excellence, remains comparatively underexamined as a mediating mechanism linking organizational and leadership factors to lecturer productivity within the pesantren-based higher education context specifically, and interpersonal communication has similarly been studied more often as a component of leadership or organizational climate than as a direct antecedent of productivity in its own right (Huda et al., 2025). A recent bibliometric mapping of employee performance research, covering more than 2,000 Scopus-indexed publications between 2020 and 2025, found that scholarly attention in this field is dispersed across more than 700 journals and shifting toward themes such as digital leadership and organizational adaptation, with comparatively limited concentration on faith-based or pesantren-specific higher education settings (Maryadi et al., 2025). This leaves the mediating role of achievement motivation, and the specific institutional dynamics of pesantren-based governance, a gap this study is positioned to address.

This gap is consequential because pesantren-based PTKIS institutions operate under a governance logic that blends religious authority with academic

management, a combination that may condition how organizational culture, leadership, and communication translate into lecturer motivation and, in turn, productivity. Existing studies that isolate these variables individually, without accounting for achievement motivation as an intervening mechanism, offer only a partial account of how productivity is actually produced in this setting. A model that traces both the direct and the indirect pathways connecting organizational culture, servant leadership, and interpersonal communication to lecturer productivity through achievement motivation is therefore needed to explain the pattern observed in the preliminary survey data.

Accordingly, this study aims to examine the direct effects of organizational culture, servant leadership, interpersonal communication, and achievement motivation on the work productivity of lecturers at pesantren-based PTKIS institutions in Kopertais Region I Jakarta and Banten, as well as the indirect effects of organizational culture, servant leadership, and interpersonal communication on productivity through achievement motivation as an intervening variable. In addition to testing these relationships, the study identifies which productivity indicators most urgently require improvement and which should be maintained, providing a diagnostic basis for institutional strategy rather than a purely explanatory model.

The contribution of this study is fourfold. First, it extends the productivity literature into a higher education subsector, pesantren-based Islamic higher education, that has received disproportionately little empirical attention relative to its institutional footprint. Second, it tests achievement motivation as an intervening variable in a combined organizational culture, servant leadership, and interpersonal communication model, addressing a mediating pathway that prior studies have typically examined only in part. Third, by coupling path analysis with an indicator-level diagnostic approach, the study offers institutional leaders and policymakers a practical basis for prioritizing which productivity dimensions warrant intervention, rather than a general statement that these variables matter. Fourth, by testing McClelland's achievement motivation theory, originally developed and validated primarily in Western organizational settings, within a pesantren-based Islamic institutional context governed simultaneously by religious authority and academic bureaucracy, the study offers an empirical basis for assessing whether this theory's core assumptions about individual striving toward excellence hold in a non-Western, faith-based setting, or whether they require adaptation to account for the collective and religiously grounded motivational structures characteristic of pesantren life.

LITERATURE REVIEW

Lecturer Work Productivity

Work productivity is conventionally defined as the ratio between the output an individual or organization generates and the resources invested to produce it, a formulation rooted in organizational behavior theory (Robbins & Judge, 2023).

Applied to the academic profession, lecturer productivity extends this ratio to the outputs mandated by the Tri Dharma framework: teaching quality, scientific publication, and community service, together with the supporting dimensions of technology utilization and time management that this study treats as measurable indicators.

Recent empirical work reinforces that lecturer productivity is not a fixed trait but a product of the organizational and leadership conditions surrounding the individual. A case study of organizational culture transformation found that when an institution closes the gap between its current and desired cultural state, particularly around teamwork, participation, and professional development opportunity, measured performance improves accordingly (Sindakis et al., 2024). This supports treating productivity as an outcome shaped jointly by structural, relational, and motivational factors, which is the premise this study builds on.

Organizational Culture, Servant Leadership, and Interpersonal Communication

Organizational culture is treated here as the shared system of values, norms, and assumptions that guides how members interpret and respond to their work environment (McShane & Glinow, 2024; Robbins & Judge, 2023). A culture that reinforces risk tolerance, outcome orientation, and team cohesion functions as more than a behavioral backdrop; recent evidence from a multinational subsidiary context shows that deliberately closing cultural gaps in these dimensions produces measurable performance gains (Sindakis et al., 2024). Within Islamic higher education specifically, this conceptualization has recently been extended beyond generic organizational values to include the institutional culture of research itself: a qualitative study of Islamic higher education institutions found that a caring, relationally attentive leadership culture directly cultivates a research-oriented institutional climate, addressing the emotional and motivational barriers, such as isolation and burnout, that otherwise suppress faculty research output (Walid et al., 2025). This suggests that in faith-based institutional settings, organizational culture and leadership are not easily separable constructs, a consideration relevant to how this study interprets its own findings.

Servant leadership is defined as a leadership orientation that subordinates the leader's own interest to the growth and needs of followers (Sendjaya, 2015; Spears, 2002). Beyond its widely cited direct effect on follower outcomes, recent research shows this style operates partly through psychological pathways: servant leadership has been found to strengthen employees' taking-charge behavior by first enhancing their intrinsic motivation and the quality of their relationship with supervisors, suggesting that its influence on productivity is not purely direct but channeled through the follower's internal state (Hu et al., 2025). This body of evidence should not, however, be read as settled. In a recent theoretical exchange between a servant leadership researcher and an outside critic, the central objections raised against the

theory were the underdeveloped explanation of the mechanisms through which servant leadership produces its effects, weak theoretical justification for why its proposed dimensions belong together, and persistent measurement inconsistencies across studies (Liden & Knippenberg, 2025). These are reasonable concerns, and they suggest that servant leadership should be treated as one useful lens on leadership rather than a fully settled explanatory framework, alongside competing paradigms such as transformational and authentic leadership that emphasize different mechanisms, vision and charisma in one case, self-awareness and relational transparency in the other, for translating leadership into follower outcomes.

Interpersonal communication, characterized by openness, empathy, supportiveness, and equality between parties, plays a comparable dual role (DeVito, 2026). Evidence from an internal communication study found that communication quality improved employee performance both directly and indirectly, with work motivation carrying a meaningful share of that effect (Dhone & Sarwoko, 2022). Taken together, these three constructs point toward a common mechanism: their influence on productivity appears to run partly through the individual's motivational state rather than acting on output in isolation.

Achievement Motivation as a Mediating Variable

Achievement motivation is defined as the drive to meet or exceed a standard of excellence, characterized by a preference for moderately challenging goals, responsiveness to feedback, and a willingness to accept calculated risk (McClelland, 1987; Salami, 2008). Because this drive is internally generated but externally shaped, it is well positioned to mediate between organizational or leadership conditions and the individual's eventual output.

This mediating role has empirical support in adjacent higher education contexts. A study of lecturer performance found that leadership style improved outcomes substantially through its effect on work motivation rather than through a purely direct channel, a pattern consistent with the servant leadership and communication findings discussed above (Subhaktiyasa et al., 2024). This convergence across leadership, culture, and communication research justifies modeling achievement motivation as the intervening variable connecting all three exogenous constructs to lecturer productivity in the present study, rather than testing each construct's direct effect in isolation.

Hypotheses Development

Drawing on the theoretical and empirical foundation above, this study proposes that organizational culture, servant leadership, and interpersonal communication each exert a positive direct effect on lecturer work productivity and on achievement motivation, and that achievement motivation in turn exerts a positive direct effect on productivity. The following hypotheses are tested:

1. Organizational culture has a positive direct effect on lecturer work productivity.
2. Servant leadership has a positive direct effect on lecturer work productivity.
3. Interpersonal communication has a positive direct effect on lecturer work productivity.
4. Achievement motivation has a positive direct effect on lecturer work productivity.
5. Organizational culture has a positive direct effect on achievement motivation.
6. Servant leadership has a positive direct effect on achievement motivation.
7. Interpersonal communication has a positive direct effect on achievement motivation.
8. Organizational culture has a positive indirect effect on lecturer work productivity through achievement motivation.
9. Servant leadership has a positive indirect effect on lecturer work productivity through achievement motivation.
10. Interpersonal communication has a positive indirect effect on lecturer work productivity through achievement motivation.

RESEARCH METHODOLOGY

This study used a quantitative survey design with path analysis, aimed at distinguishing the direct and indirect effects of four exogenous constructs, organizational culture, servant leadership, interpersonal communication, and achievement motivation, on lecturer work productivity as the endogenous variable, with achievement motivation additionally modeled as an intervening variable between the other three constructs and productivity (Creswell & Creswell, 2022). The structural model is illustrated above: organizational culture, servant leadership, and interpersonal communication each carry a hypothesized direct path to productivity and an indirect path through achievement motivation.

The population comprised permanent lecturers holding the functional academic ranks of Assistant Professor, Lecturer, or Senior Lecturer at five pesantren-based private Islamic higher education institutions under Kopertais Region I Jakarta and Banten, for a total of 142 lecturers across the five campuses (Table 1). Lecturers without a formal functional academic rank were excluded because productivity in this study is defined partly through outputs, such as accredited publication and promotion-linked activity, that are not yet formally assessed for this group, making their inclusion methodologically inconsistent with the productivity indicators used here. Lecturers holding the rank of full Professor were also excluded, not because their productivity was assumed to be uniformly

high across all three Tri Dharma dimensions, since variation in teaching, research, and service almost certainly exists within this group as well, but because professors at these institutions numbered too few to support reliable subgroup estimation and are subject to different formal expectations, including administrative and mentorship duties that are not comparably assigned to non-professorial lecturers. We acknowledge that this exclusion narrows the generalizability of the findings to non-professorial lecturers specifically, and we return to this as a limitation later in the manuscript. Using the Taro Yamane formula at a 5 percent margin of error, the required sample size was 105 lecturers, drawn through proportional random sampling and allocated across the five campuses in proportion to their share of the population.

Table 1 Population and Sample Distribution Across Participating Campuses

Campus	Population	Sample
STAI Minhaajurroosyidiin	17	12
STISNU Nusantara	26	19
STIT Insida	16	12
STES Bakti Nugraha	16	12
Institut Daarul Qur'an Jakarta	67	50
Total	142	105

Source: Researchers Database (2026)

Because the Taro Yamane formula assumes simple random sampling for a single proportion and does not itself establish adequacy for a multivariate path model, sample size adequacy was additionally checked against regression-based power benchmarks. Following Green's (1991) widely used rule of thumb for multiple regression, a minimum of $50 + 8m$ cases is recommended for testing the overall explained variance of a model, and a minimum of $104 + m$ cases for testing individual partial coefficients within it, where m is the number of predictors. For the productivity equation ($m = 4$ predictors), these benchmarks call for at least 82 and 108 cases respectively; for the achievement motivation equation ($m = 3$ predictors), at least 74 and 107 cases respectively. With $n = 105$, this study comfortably exceeds the threshold for testing overall model fit in both equations, but falls marginally short, by two to three cases, of the stricter benchmark for testing individual partial coefficients. This shortfall is acknowledged as a limitation of the present sample rather than concealed, and it should be weighed when interpreting the smaller individual path coefficients reported in the Results.

Data were collected through a structured questionnaire covering all five constructs, using a five-point Likert-type scale in which higher ratings indicated higher attainment: always was coded 5, often 4, sometimes 3, rarely 2, and never 1, so that higher mean scores throughout the Results correspond to stronger performance on that indicator. Productivity was measured across five indicators

(teaching performance, scientific publication, community service, technology utilization, and time management); organizational culture across four indicators (risk-taking, competitiveness, dedication to the organization, and work norms); servant leadership across eight indicators adapted from the servant leadership literature (vision, listening, healing, humility, empathy, serving, attentiveness, and wisdom); interpersonal communication across five indicators (honesty, concern for others, group support, constructive attitude, and shared perception); and achievement motivation across four indicators (drive to excel, results orientation, responsiveness to feedback, and preference for challenging goals). Each instrument was initially developed with 40 items and piloted on 30 lecturers outside the study sample. Item validity was assessed using Pearson product-moment item-total correlation against the critical value for $n = 30$ at the 5 percent significance level ($r_{\text{table}} = 0.361$, $df = 28$), and items falling below this threshold were dropped rather than retained. Table 2 reports the number of items dropped and the final number retained per variable alongside the resulting Cronbach's alpha; the exact item-total correlation range for the retained items in each variable was not available in the source materials reviewed for this revision and should be pulled directly from the original SPSS output before submission, since reviewers will expect this range reported explicitly.

Table 2 Instrument Development, Item Retention, and Reliability Results

Variable	Items Developed	Items Dropped	Items Retained (of 40)	Cronbach's Alpha
Lecturer work productivity (Y)	40	9	31	0.871
Organizational culture (X1)	40	8	32	0.839
Servant leadership (X2)	40	8	32	0.925
Interpersonal communication (X3)	40	6	34	0.939
Achievement motivation (X4)	40	5	35	0.939

Source: Analyzed by the researchers (2026)

All five instruments exceeded the conventional 0.70 threshold for internal consistency, indicating that the retained items in each variable reliably measured a common underlying construct even after the weaker items identified in the pilot were removed. Prior to hypothesis testing, the data were screened against the assumptions required for path analysis: normality using the Liliefors test, homogeneity of variance using Bartlett's test, and linearity of each bivariate

relationship using ANOVA regression significance testing, all processed in SPSS. Path coefficients were then estimated for two structural equations, the first regressing productivity on all four exogenous variables, and the second regressing achievement motivation on organizational culture, servant leadership, and interpersonal communication. Each of the ten hypothesized paths, seven direct and three indirect, was tested against a one-tailed null hypothesis of no positive effect, with indirect effects additionally verified using the Sobel test, and path coefficients interpreted as weak (0.05 to 0.09), moderate (0.10 to 0.29), or strong (above 0.30) following established convention.

Beyond hypothesis testing, the study applied SITOREM (Scientific Identification Theory to Conduct Operation Research in Education Management) to translate the statistical results into an actionable diagnostic. This analysis proceeded in three stages: calculating each variable's contribution to productivity from the squared path coefficients, computing the mean actual score for every indicator across all five variables, and weighting each indicator against four criteria (cost, benefit, urgency, and importance) through expert judgment. Cross-referencing indicator weight against indicator score identified two priority groups, indicators combining high weight with a low actual score, flagged for immediate improvement, and indicators combining high weight with a high actual score, flagged for continued reinforcement. This classification directly informed the action plan proposed in the final section of the study.

RESULT AND DISCUSSION

Descriptive Statistics

Descriptive analysis was conducted on the responses of 105 lecturers across the five dimensions measured in this study. Table 3 summarizes the central tendency and dispersion of each variable.

Table 3 Descriptive Statistics of The Research Variables

Statistic	Productivity (Y)	Organizational Culture (X1)	Servant Leadership (X2)	Interpersonal Communication (X3)	Achievement Motivation (X4)
N	105	105	105	105	105
Mean	108	121	125	130	141
Median	109	120	126	131	142
Mode	115	125	123	133	138
Std. deviation	12	13	14	13	15
Minimum	69	91	87	102	105
Maximum	155	160	160	170	175

Source: Analyzed by the researchers (2026)

The productivity scores clustered around the 97–110 interval, which accounted for 42 percent of respondents, indicating that the sample's productivity level was concentrated in the mid-range of the scale rather than at the extremes. Achievement motivation showed both the highest mean (141) and the widest spread (standard deviation of 15) among the five variables. Read alongside the path results below, this combination is informative rather than incidental: because achievement motivation sits closer to productivity in the causal chain than the three exogenous variables, a wider spread here means individual lecturers vary more sharply in exactly the state most proximate to their output, which helps explain why interventions targeting motivation directly are likely to move productivity more than interventions aimed only at the more uniformly distributed organizational and leadership variables. The relatively high mean also suggests that most lecturers in this sample already report a reasonably strong internal drive to excel, so the practical lever is less about instilling motivation from nothing and more about closing the gap for the subset of lecturers pulling the standard deviation wide, likely those whose organizational and relational conditions, per the path results, are weaker.

Preliminary Assumption Tests

Before path analysis was performed, the data were tested against the three assumptions required for the technique. The Liliefors test confirmed that the estimated standard error of every variable, and of every variable regressed against achievement motivation, was normally distributed (all L-count values fell below the L-table critical value of 1.983 at $\alpha = 0.05$). The ANOVA-based linearity test confirmed a significant linear relationship for every hypothesized path, with deviation-from-linearity significance values ranging from 0.061 to 0.882, all comfortably above the 0.05 threshold required to retain linearity. The homogeneity test, conducted using Bartlett's chi-square procedure, produced several negative chi-square values in the original computation, which is not mathematically possible for a chi-square statistic. Because a negative chi-square indicates an error in how the test was applied rather than a valid result, the original "homogeneous" conclusion cannot be treated as established. This test needs to be rerun using SPSS's built-in Levene's test before the manuscript is resubmitted; I don't have access to the raw dataset needed to rerun it myself, so this is left as an open item for you rather than a corrected figure.

Path Analysis and Hypothesis Testing

Two structural equations were estimated. Substructure 1 regressed productivity on all four exogenous variables and explained 24.2 percent of the variance in productivity ($R^2 = 0.242$), leaving a residual coefficient of 0.871 for factors outside the model. Substructure 2 regressed achievement motivation on organizational culture, servant leadership, and interpersonal communication and

explained 55.8 percent of the variance in achievement motivation ($R^2 = 0.558$), a substantially stronger fit than Substructure 1, with a residual coefficient of 0.665. For context, a comparable mixed-methods study of teacher productivity in Indonesian Islamic elementary schools reported a considerably higher explained variance of 83.1 percent using an integrated model with five predictors and a formal mediation chain (Anawati et al., 2025); the more modest fit obtained here likely reflects this study's narrower predictor set, its reliance on a single composite productivity score rather than separately modeled sub-outcomes, and the shared self-report method across all variables, a limitation discussed further below. Table 4 presents the standardized path coefficients and hypothesis decisions for all ten paths, interpreted as weak (0.05 to 0.09), moderate (0.10 to 0.29), or strong (above 0.30) following Riduwan and Kuncoro (2011) widely used convention for path analysis in Indonesian social science research.

Table 4 Path Coefficients and Hypothesis Testing Results

Path	Standardized coefficient (β)	t-value	t-table ($\alpha = 0.05$)	Decision
Organizational culture → Productivity	0.078	7.684	1.983	H1 supported (weak)
Servant leadership → Productivity	0.135	11.119	1.983	H1 supported (moderate)
Interpersonal communication → Productivity	0.130	4.030	1.983	H1 supported (moderate)
Achievement motivation → Productivity	0.237	7.811	1.983	H1 supported (moderate)
Organizational culture → Achievement motivation	0.303	3.740	1.983	H1 supported (strong)
Servant leadership → Achievement motivation	0.179	5.998	1.983	H1 supported (moderate)
Interpersonal communication → Achievement motivation	0.404	4.649	1.983	H1 supported (strong)
Organizational culture → Productivity (via motivation)	0.072 (indirect); 0.150 (total)	Sobel z = 3.634, p < .001	—	H1 supported, partial mediation
Servant leadership → Productivity (via motivation)	0.042 (indirect); 0.177 (total)	Sobel z = 4.304, p < .001	—	H1 supported, partial mediation
Interpersonal communication → Productivity (via motivation)	0.096 (indirect); 0.226 (total)	Sobel z = 5.689, p < .001	—	H1 supported, partial mediation

Source: Analyzed by the researchers (2026)

All ten hypotheses were supported. Ranked by strength, interpersonal communication's effect on achievement motivation was the single strongest path in the entire model ($\beta = 0.404$, strong), followed by organizational culture's effect on achievement motivation ($\beta = 0.303$, strong). Among the direct effects on productivity itself, achievement motivation was the strongest ($\beta = 0.237$, moderate) and organizational culture the weakest ($\beta = 0.078$, the only path classified as weak in the model). This ordering indicates that culture's influence on productivity runs mostly through motivation rather than acting on productivity on its own, a pattern discussed further below. A correlation matrix among all five variables would normally accompany this table as standard path analysis reporting practice, and I don't have the raw composite scores needed to compute one. If you can share the dataset, or even just the five-variable correlation table from your SPSS output, I can add it directly.

SITOREM Indicator Diagnostics

The SITOREM analysis combined each indicator's expert-rated weight (cost, benefit, urgency, and importance) with its mean actual score to classify indicators into two groups: those with high weight but a comparatively low score, flagged for immediate improvement, and those with high weight and a high score, flagged for continued reinforcement. Table 5 summarizes the classification for the productivity variable itself, which is the outcome of greatest practical interest.

Table 5 Priority Classification of Lecturer Productivity Indicators

Indicator	Expert weight	Mean score	Classification
Scientific publication	22%	3.18	Priority for improvement
Community service	17%	3.30	Priority for improvement
Time management	22%	3.75	Priority for improvement
Teaching performance	19%	4.35	Maintain or develop
Technology utilization	20%	4.05	Maintain or develop

Source: Analyzed by the researchers (2026)

The same procedure applied to the three exogenous variables and to achievement motivation identified the specific sub-dimensions driving each construct's contribution. Within organizational culture, risk-taking, competitiveness, and dedication to the organization were flagged for improvement, while work norms were already strong. Within servant leadership, vision, empathy, attentiveness, and wisdom were flagged for improvement, while listening, healing, humility, and the act of serving itself were already strong. Within interpersonal communication, concern for others, constructive attitude, and shared perception were flagged for improvement, while honesty and group support were already strong. Within achievement motivation, only responsiveness to feedback was flagged for improvement.

The exact numeric cutoffs used to separate “high weight” from “low weight” and “low score” from “high score” are not stated explicitly in the source material available to me, only the resulting classifications shown above. I'd recommend adding a sentence specifying the cutoffs used, for example, weight above a stated percentage combined with a mean score below a stated value, since a reviewer will otherwise have no way to verify the classification logic independently. Likewise, the number of experts involved in the cost-benefit-urgency-importance weighting and how they reached consensus are not specified anywhere I could find; the source material only refers to “one or more experts.” Both of these are things you'll need to supply from your own records of how the SITOREM weighting was actually conducted, since I have no basis to invent a number.

Direct Effects on Lecturer Productivity

Organizational culture, servant leadership, interpersonal communication, and achievement motivation each had a statistically significant positive direct effect on lecturer productivity, confirming Hypotheses 1 through 4. Achievement motivation carried the strongest direct effect of the four ($\beta = 0.237$), followed by servant leadership ($\beta = 0.135$), interpersonal communication ($\beta = 0.130$), and organizational culture ($\beta = 0.078$, the weakest path in the model). This ordering is consistent with the theoretical expectation that a proximal psychological state, in this case the internal drive to excel, exerts a more immediate influence on observable output than a distal organizational or relational condition, which more plausibly operates through that psychological state rather than directly on behavior. The finding that achievement motivation exerted the largest direct effect aligns with evidence from lecturer performance research showing that motivation functions as the more proximate driver of output even when leadership and organizational factors are also present in the model (Subhaktiyasa et al., 2024). The comparatively modest direct effect of organizational culture is likewise consistent with case-study evidence that culture shapes performance gradually, through cumulative shifts in team orientation and outcome focus, rather than through a single strong direct channel (Sindakis et al., 2024).

This picture is not unanimous in the wider literature, however. A mixed-methods study of teacher productivity in a comparable Indonesian Islamic education setting found that empowerment, knowledge sharing, and job design, three variables conceptually adjacent to organizational culture and servant leadership, showed no significant direct effect on productivity at all, with academic supervision emerging as the only strong direct predictor (Anawati et al., 2025). Read against that finding, the present study's result that organizational culture retains a significant, if weak, direct effect is not guaranteed by the broader literature and should be read as one data point among genuinely mixed findings rather than a settled conclusion. This divergence may reflect differences in how “organizational support” is operationalized across studies, or it may reflect real contextual

differences between elementary and higher education settings, a question this study's design cannot resolve on its own.

Practically, these results indicate that interventions aimed narrowly at strengthening organizational culture are unlikely to move productivity as quickly as interventions that also address the psychological and relational conditions surrounding lecturers. This interpretation is reinforced by the SITOREM findings, which located the productivity shortfall specifically in scientific publication, community service, and time management, precisely the three indicators that depend most on sustained individual initiative rather than institutional structure alone.

Direct Effects on Achievement Motivation

Organizational culture, servant leadership, and interpersonal communication each also had a statistically significant positive direct effect on achievement motivation, confirming Hypotheses 5 through 7, and this structural equation explained considerably more variance (55.8 percent) than the productivity equation (24.2 percent). Interpersonal communication had the strongest effect on motivation of any path in the entire model ($\beta = 0.404$), followed by organizational culture ($\beta = 0.303$) and servant leadership ($\beta = 0.179$).

The magnitude of communication's effect is worth examining mechanistically rather than simply reporting: communication, unlike culture or leadership style, is enacted moment to moment in direct exchange between colleagues, which means it carries immediate, repeated feedback about whether a lecturer's effort is seen and valued, something a broader cultural climate or a leader's general style communicates far less frequently and less specifically. This is consistent with evidence that communication quality shapes motivational outcomes through the concrete, recurring sense of being heard and supported that open, honest exchange creates on a day-to-day basis, a mechanism that operates at a higher frequency than culture-level or leadership-style effects, which tend to be inferred more diffusely over time (Dhone & Sarwoko, 2022). The comparatively weaker, though still significant, effect of servant leadership on motivation fits a similar logic in reverse: servant leadership's influence on follower outcomes appears to travel through more specific psychological mechanisms, such as intrinsic motivation and supervisor relationship quality, that require sustained relational investment to build, which may make its effects slower to register in a cross-sectional design like this one than communication's more immediate signal (Hu et al., 2025).

The Mediating Role of Achievement Motivation

All three indirect paths, from organizational culture, servant leadership, and interpersonal communication to productivity through achievement motivation, were statistically significant, confirming Hypotheses 8 through 10. To be transparent about how these figures were derived, since the original computation

contained an error worth walking through explicitly: an indirect effect in path analysis is calculated as the product of the path coefficient from the exogenous variable to the mediator, and the path coefficient from the mediator to the outcome. For organizational culture, this is the path from culture to achievement motivation ($\beta = 0.303$) multiplied by the path from achievement motivation to productivity ($\beta = 0.237$), giving an indirect effect of 0.072. The original computation instead multiplied culture's direct-to-productivity coefficient (0.078) by the same 0.237, giving an incorrect value of 0.018; the correct figure is more than three times larger. The same correction applies to the other two paths: servant leadership's indirect effect is $0.179 \times 0.237 = 0.042$ (not 0.032 as originally computed), and interpersonal communication's indirect effect is $0.404 \times 0.237 = 0.096$ (not 0.031 as originally computed). Total effects, the sum of direct and indirect, are therefore 0.150 for organizational culture, 0.177 for servant leadership, and 0.226 for interpersonal communication. All three were verified as statistically significant through the Sobel test, which uses the unstandardized coefficients and their standard errors rather than the standardized figures above, so the corrected multiplication does not change the Sobel results themselves, only the standardized indirect-effect figures reported alongside them.

The Sobel test itself is worth qualifying rather than treating as the final word on these mediation effects. Sobel's method assumes the indirect effect's sampling distribution is normal, an assumption that is frequently violated in practice since the product of two coefficients is typically skewed, and the test is known to be conservative as a result, meaning it can understate significance in smaller samples. Bootstrapped confidence intervals, generated by resampling the dataset a large number of times, typically five thousand, and estimating the indirect effect in each resample, are now the standard alongside or in place of the Sobel test in mediation analysis, since they don't rely on the normality assumption. I don't have access to the raw dataset needed to run this resampling procedure, so I can't generate these intervals here; I'd recommend running this in Hayes's PROCESS macro for SPSS (model 4, 5000 bootstrap samples) or in R via lavaan before resubmission, since a reviewer at this level is likely to ask for it directly given the comment already raised.

Because each direct effect on productivity remained significant even with achievement motivation included in the model, the pattern indicates partial rather than full mediation. Interpersonal communication produced the largest total effect on productivity of the three exogenous variables (0.226), which, combined with its status as the strongest predictor of achievement motivation itself, positions communication quality as the single most leveraged intervention point in this model. This finding is broadly consistent with evidence that support structures and individual motivational orientation jointly, rather than independently, determine research and performance output, though as noted in section 4.1, this pattern is not universal across the literature and should be interpreted with that caveat in mind (Susanti et al., 2023).

On Model Fit Statistics

One further methodological point is worth addressing directly, since a reviewer raised the absence of global fit indices such as chi-square, RMSEA, CFI, TLI, and SRMR. These indices are meaningful for structural equation models that impose restrictions, paths the researcher chooses not to estimate, because fit indices quantify how well the restricted model reproduces the full pattern of covariances among variables. The model tested in this study is fully recursive and just-identified: every path permitted by the hypothesized causal ordering (culture, leadership, and communication to motivation; all four to productivity) is estimated, with no paths omitted or fixed to zero.

A just-identified path model of this kind reproduces the observed covariance matrix exactly, by construction, which means chi-square, RMSEA, CFI, TLI, and SRMR are not informative in the way they would be for an over-identified SEM with a measurement model and omitted paths; a just-identified model always shows a technically perfect fit regardless of whether the underlying theory is correct. If the underlying instrument were instead modeled with latent variables, each measured by its constituent items rather than as a single composite score, then fit indices would become meaningful again, since the measurement model itself imposes real restrictions. This would require re-specifying the study as a full SEM in a program such as AMOS or lavaan using item-level data rather than composite scores, which is a substantially larger undertaking than the current path analysis and outside what I can do without the raw item-level dataset. I'd suggest explaining this reasoning directly in your response to the reviewer rather than attempting to report fit indices that would not be meaningful for the model as specified.

Diagnostic Implications for Institutional Priority-Setting

The SITOREM results translate the statistical model into a concrete action agenda, though the specific interventions need to be grounded in how a pesantren-based institution actually operates rather than stated generically. Scientific publication and community service, the two lowest-scoring productivity indicators despite carrying substantial expert-assigned weight, should be the first targets of institutional intervention. In a pesantren-based context specifically, “structured research mentoring” cannot simply mean blocking off research hours the way a conventional university might, since many lecturers at these institutions carry religious teaching duties, dormitory supervision, and *ubudiyah* (worship-related) responsibilities that are non-negotiable parts of the institutional mission rather than discretionary load. A workable version of research mentoring here would need to be scheduled around, rather than in competition with, these existing obligations, for example through short, recurring writing circles held during the institution's existing communal study periods, or through pairing early-career lecturers with senior lecturers who have already navigated the same dual teaching-and-religious-duty structure, rather than importing a research-release model designed for

institutions without this obligation. Community service interventions face a related but inverted challenge: pesantren-based institutions are often already deeply embedded in community religious and social life informally, so the gap identified here is less likely to be a lack of community engagement itself than a lack of translating existing informal community involvement into the documented, reportable form that institutional productivity metrics require.

Because interpersonal communication showed the strongest link to achievement motivation, and because concern for others, constructive attitude, and shared perception were the specific communication indicators flagged as underdeveloped, an intervention that improves the quality of everyday interaction, such as structured mentoring circles or regular feedback forums, is likely to produce compounding benefits. Conversely, indicators already classified as strengths, including teaching performance, technology utilization, honesty, and the servant leadership behaviors of listening and humility, do not require corrective investment and should instead be maintained through recognition and continued institutional support.

Limitations

This study has several limitations that should be considered when interpreting its findings. The model was restricted to four constructs and does not capture other plausible influences on lecturer productivity, such as compensation structure, workload distribution, or institutional accreditation status. The study is also limited to a single institutional type, pesantren-based PTKIS specifically, so the findings should not be assumed to generalize to conventional secular universities or to Islamic higher education institutions without a pesantren-based governance structure without further testing. All five variables were measured through self-report administered to the same respondents at a single point in time, which raises the possibility of common-method bias, where relationships between variables are partly inflated by shared measurement method rather than reflecting the true underlying relationship, and rules out any strong causal interpretation of the paths reported here.

This concern is particularly relevant for servant leadership and interpersonal communication, where lecturers rating their own leaders or colleagues favorably may also be subject to social desirability bias, a tendency to respond in a way that appears more positive or acceptable rather than strictly accurate, especially in a research culture where junior faculty may be reluctant to rate senior colleagues critically. The cross-sectional design further means that while the paths are consistent with the hypothesized direction of influence, they cannot rule out reverse or reciprocal causation, for instance, more productive lecturers may simply perceive their leadership and communication environment more favorably rather than the reverse. Finally, the sample size, while adequate for the model's overall explanatory tests, sits marginally below the recommended threshold for testing individual

coefficients discussed in the Methods section, and the sample was confined to five institutions within a single Kopertais region, which limits statistical power for detecting smaller effects and constrains how confidently these findings extend to other regions.

CONCLUSION

This study confirmed that organizational culture, servant leadership, and interpersonal communication each exert a statistically significant positive direct effect on lecturer work productivity at pesantren-based PTKIS institutions, and that each also significantly strengthens achievement motivation, which in turn has the strongest direct effect on productivity among all four variables tested. Achievement motivation partially mediates the relationship between all three exogenous variables and productivity, meaning that culture, leadership, and communication each retain explanatory value on their own while producing a measurably larger combined effect once their influence on motivation is accounted for. The resulting structural equations, expressed here in standardized form, are $Y = 0.078X_1 + 0.135X_2 + 0.130X_3 + 0.237X_4 + 0.871$ for productivity and $X_4 = 0.303X_1 + 0.179X_2 + 0.404X_3 + 0.665$ for achievement motivation, where each coefficient is a standardized path coefficient (beta) rather than an unstandardized regression weight, and the final term in each equation is the residual coefficient rather than a constant. These equations indicate that interpersonal communication is the strongest lever on motivation, while motivation itself is the strongest lever on productivity, positioning the communication-to-motivation pathway as the most consequential channel identified in this study.

Beyond confirming these statistical relationships, the SITOREM diagnostic identified exactly where institutional effort should be concentrated. Scientific publication, community service, and time management emerged as the productivity indicators most urgently requiring improvement, while teaching performance and technology utilization were already strong enough to be maintained rather than redirected. At the level of the predictor variables, the specific sub-dimensions requiring attention were risk-taking, competitiveness, and organizational dedication within organizational culture; vision, empathy, attentiveness, and wisdom within servant leadership; concern for others, constructive attitude, and shared perception within interpersonal communication; and responsiveness to feedback within achievement motivation. This indicator-level diagnosis distinguishes this study's contribution from a purely explanatory model: it converts statistical significance into a ranked, actionable list of what pesantren-based institutions should fix first.

Taken together, these findings support a central conclusion: improving lecturer productivity in pesantren-based higher education institutions requires simultaneous, coordinated investment across organizational, leadership, relational, and motivational dimensions, rather than isolated reform in any single area.

Because organizational culture, servant leadership, and interpersonal communication influence productivity both directly and indirectly through achievement motivation, institutional strategies that strengthen day-to-day communication quality and psychological drive alongside more conventional culture- and leadership-focused reforms are likely to yield a larger and more durable improvement in productivity than culture or leadership initiatives pursued in isolation.

RECOMMENDATIONS

Based on these findings, institutional leaders at pesantren-based PTKIS campuses should prioritize the indicators identified as weakest rather than pursuing broad, undifferentiated reform. Concretely, this means establishing structured research mentoring and protected time for scientific publication, formalizing community service as a tracked and incentivized activity rather than an informal expectation, and providing lecturers with practical time management support. Because interpersonal communication showed the strongest link to achievement motivation, campus leadership should also invest in regular, structured feedback and mentoring forums between lecturers, department heads, and institutional leadership, since this channel is likely to produce compounding benefits for both communication quality and motivational strength simultaneously. While this recommendation is supported by the statistical findings, it should be implemented alongside qualitative assessment to ensure it is appropriate to the specific institutional culture, since a path model of this kind can identify which levers matter most on average but cannot capture the particular religious, social, and administrative texture of any single campus that would shape how a given intervention should actually be designed and delivered there.

At the policy level, government and accreditation bodies overseeing PTKIS institutions should consider aligning funding and accreditation criteria with the specific productivity dimensions this study found weakest, particularly research output and community engagement, rather than relying on uniform standards that do not account for the distinct governance and resource constraints of pesantren-based institutions. For future research, this model should be tested across a broader range of PTKIS institutions and regions to assess whether the mediating role of achievement motivation, and the relative strength of communication as its strongest predictor, hold beyond the Kopertais Region I context, and future studies should consider incorporating additional variables such as compensation structure and workload distribution that fell outside the scope of the present model.

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