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# The Role of Lecturer Teaching Strategies and Learning Environments in Shaping Motivation Among Indigenous Students in Higher Education

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**ABSTRACT**

Higher education is expected not only to develop academic competence but also to foster students' motivation and engagement, particularly among Indigenous learners who often face cultural and systemic barriers. This study examines how lecturers' teaching strategies influence the learning motivation of Indigenous Papuan students, with learning styles and learning environments as potential mediators. A quantitative cross-sectional survey was conducted among 129 Indigenous students from the Faculty of Teacher Training and Education at Cenderawasih University. Data were collected using a validated questionnaire measuring teaching strategies, learning styles, learning environments, and student motivation. Partial Least Squares Structural Equation Modeling (PLS-SEM) was applied to analyze the measurement and structural models. Findings revealed that lecturer teaching strategies had a significant direct impact on student motivation ($\beta = 0.574$, $p < 0.001$) and learning environment ($\beta = 0.680$, $p < 0.001$). The learning environment significantly mediated the relationship between teaching strategies and motivation, whereas learning styles showed no significant direct or mediating effect. The results emphasize that culturally responsive and well-structured teaching strategies, supported by an inclusive learning environment, play a crucial role in enhancing Indigenous students' motivation. In contrast, individual learning styles had minimal influence, highlighting a shift away from traditional assumptions about learning preferences. Higher education institutions should prioritize adaptive teaching practices and culturally relevant learning environments to support the motivation and academic success of Indigenous learners.



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## 1. INTRODUCTION

Higher education is increasingly expected not only to produce graduates with strong academic competence (Campbell et al., 2024; Roknaldin et al., 2025) but also to cultivate individuals who are autonomous, creative, and motivated to engage in lifelong learning (Eltahir & Alsalhi, 2025). Academic motivation has been widely recognized as a key determinant of student success (Bai et al., 2025; Campbell et al., 2024; Pourtousi et al., 2024; Santana-Monagas et al., 2025). Strong motivation not only drives students to achieve optimal learning outcomes but also strengthens their academic resilience, sustained participation, and long-term commitment to learning (Alatawi et al., 2024; Bai et al., 2025; Campbell et al., 2024; Pourtousi et al., 2024;). The teaching strategies adopted by lecturers play a pivotal role in shaping students' learning motivation, as they directly influence how learners engage with course content and sustain their academic commitment.

Indigenous students often face cognitive and emotional challenges when transitioning from a rural learning environment to a higher education system that demands independence and cross-cultural adaptation (Durmush et al., 2024). A key, yet unexplored, issue is the mismatch between lecturers' teaching strategies and the unique learning needs of Indigenous students (Han, 2022). Despite growing interest in inclusive pedagogy, empirical research on the influence of lecturers' teaching strategies on the academic motivation of Indigenous students in Indonesian universities, particularly in Papua, remains very limited. According to earlier research (Sogalrey et al., 2025), the majority of the largest educational institutions in the Indonesian Timur region still use general and non-contextual teaching designs, which affects student learning outcomes, student attitudes, and local values. This viewpoint is also supported by research conducted by Liu et al., (2024), which states that learning is a personal and social process that, in turn, can significantly increase student motivation and involvement. It is crucial to conduct a systematic investigation of how instructional design affects Papuan academic students' motivation to implement more flexible, relevant, and effective teaching methods.

Relevance of learning content is a key driver of student motivation. When material aligns with students' lives and goals, their intrinsic motivation and academic commitment increase (Johansen et al. 2023). Conversely, learning that lacks personal or social connection reduces motivation (Liu et al., 2024; Zhang et al., 2024). These findings underscore the importance of learning designs that prioritize relevance. According to this area of study, a number of recent studies have highlighted how crucial adaptive, contextual, and meaningful learning design is to student engagement. Students who received projects with more personal significance reported better levels of autonomous motivation, liveliness, and learning effort than those who received generic assignments, according to an experimental study conducted in a STEM higher education setting Johansen et al. (2023). Similar results were found in an SEM study conducted in Vietnam (Vo & Ho, 2024), which demonstrated that task relevance and course clarity indirectly raise students' cognitive and emotional involvement through their expectations for learning and perceptions of the task's value. Emotional and cognitive engagement dramatically enhanced when teachers adapted their teaching tactics to students' needs, pace, and learning styles, according to recent research on adaptive learning strategies (Liu et al., 2024). In the context of higher education in eastern Indonesia, especially Papua, which has distinct cultural demands and dynamics, this evidence supports the claim that contextual and personally relevant learning design is essential for sustaining academic motivation.

Despite rapid shifts in 21st-century learning demands, many universities continue to rely on traditional teaching methods that are misaligned with the learning preferences of the digital-native generation (He et al., 2025). Such pedagogical misalignment has been shown to weaken students' academic engagement and contribute to diminished learning outcomes (Lewohl, 2023; Mohammadi Zenouzagh, Admiraal, et al., 2025). Addressing this gap is particularly urgent in Indigenous contexts, where culturally diverse learning needs intensify the consequences of outdated instructional practices. By focusing on Indigenous Papuan students, this study contributes evidence for developing a more adaptive, inclusive, and culturally responsive higher education system.

## 2. METHODS

### *2.1 Research design*

This study employed a cross-sectional quantitative survey design to evaluate the effectiveness of a teaching strategy grounded in the motivation of Papuan learners, with learning style and other relevant learning-related variables serving as mediators. The design was chosen because it enables efficient data collection from a relatively large sample within a limited time frame and allows for the systematic examination of relationships among multiple variables.

### *2.2 Conceptual framework current study*

Figure 1 presents the conceptual model examining the direct and indirect effects of lecturers' teaching strategies on students' learning motivation. The model proposes seven hypotheses: teaching strategies directly influence learning motivation (H1), learning styles (H2), and the learning environment (H3); learning styles (H4) and the learning environment (H5) directly influence learning motivation; and teaching strategies indirectly influence learning motivation through learning styles (H6) and the learning environment (H7). These hypotheses are grounded in Self-Determination Theory (Deci & Ryan, 2012), which highlights autonomy, competence, and relatedness as key drivers of intrinsic motivation. Prior studies also show that teaching strategies, learning styles, and learning environments jointly shape academic motivation (Amiruddin et al., 2023; Nguyen et al., 2022; Pham & Renshaw, 2021; M. Santana-Monagas et al., 2025). This study empirically tests the seven direct and mediated relationships outlined in H1-H7.

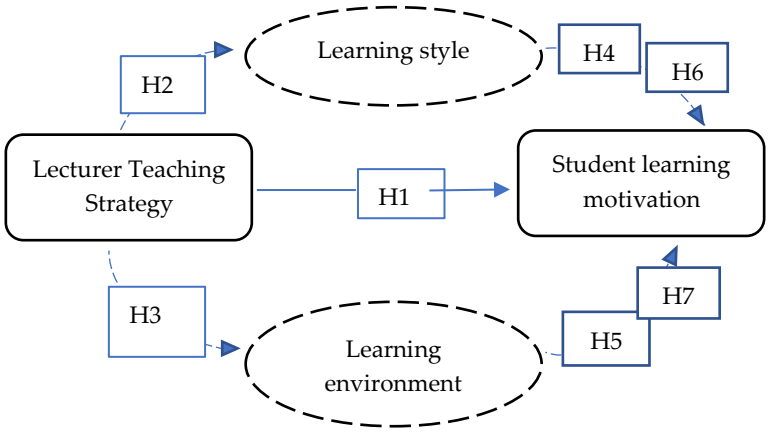


**Figure 1** Conceptual framework

### *2.3 Population and sample*

The population in this study was all native Papuan students in the Faculty of Teacher Training and Education, Cenderawasih University. The formula for estimating population means was used.

$$n = \frac{Z^2 X\ \sigma^2}{E^2}$$

$$n = \frac{1{,}96^2 X\ 0{,}256^2}{0{,}1^2}$$

With a 95% confidence level (Z = 1.96), variance $\sigma^2$ = 0.256, and a margin of error of 0.1, the minimum sample size was 99 respondents. To anticipate the possibility of dropout or invalid data of 30%, the sample size was increased to 129 respondents. Table 1. Research Sample

**Table 1.** Population and Sample

| Variable | Category | N |
|---|---|---|
| Gender N (%) | Male | 54 |
| | Female | 75 |
| Academic Semester N (%) | 1-2 | 11 |
| | 3-4 | 14 |
| | 5-6 | 60 |
| | 7-8 | 30 |
| | >8 | 14 |
| Province of Participants N (%) | Papua | 78 |
| | Papua Mountains | 23 |
| | Central Papua | 13 |
| | West Papua | 8 |
| | South Papua | 7 |

The sampling technique used was random sampling, ensuring that every member of the population had an equal chance of being selected as a research respondent. This approach was chosen to ensure representativeness and reduce bias in data collection.

### *2.4 Measures*

A structured questionnaire was adapted from a previously validated instrument to collect quantitative data from participants. The instrument consisted of four separate sections, each corresponding to a key variable examined in the study. These variables included lecturer teaching strategies, learning styles, learning environment, and student motivation. Each section consisted of several items measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was pre-tested to ensure clarity and contextual relevance, and minor adjustments were made to maintain content validity.

### *2.5 Data Collection and Analysis*

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 4. This method was chosen because of its robustness in handling small-to-medium samples, its ability to model complex cause–effect relationships, and its suitability for non-normal data distributions, which are common in educational studies involving indigenous populations. PLS-SEM also allows simultaneous assessment of measurement and structural models, ensuring both construct validity and hypothesis testing. The measurement model was first examined to establish reliability and validity. Internal consistency was verified through Cronbach's alpha and composite reliability (threshold ≥ 0.70). Convergent validity was confirmed when factor loadings exceeded 0.70 and the Average Variance Extracted (AVE) surpassed 0.50. Discriminant validity was assessed using the Heterotrait-Monotrait ratio (HTMT), with values below 0.85 indicating satisfactory construct distinctiveness.

The structural model was then evaluated to test the hypothesized relationships between latent variables. Bootstrapping with 5000 resamples was applied to estimate path coefficients, t-statistics, and significance levels ($p < 0.05$, one-tailed). Model strength and explanatory power were assessed through the coefficient of determination ($R^2$), while effect sizes ($f^2$) captured the relative impact of predictors,

and predictive relevance ($Q^2$) obtained via blindfolding confirmed the model's predictive accuracy. Mediation analysis was conducted to explore indirect effects. While the classical framework of Baron & Kenny, (1986) guided the initial approach, the study adopted (Sarstedt & Moisescu, 2024) typology to classify mediation types more rigorously. Bootstrapping was again employed to evaluate the significance of indirect paths, offering a robust and widely recommended procedure for mediation testing.

## 3. FINDINGS AND DISCUSSION

The results obtained from the research have to be supported by sufficient data. The research results and the discovery must be the answers to the research hypothesis stated previously in the introduction.

### *3.1 Demographic Profile*

The study's respondents were primarily female (75 individuals, or approximately 58.1%), with 54 individuals (41.9%) being male. The bulk of responders, 60 individuals (46.2%), were in semesters five and six of the academic year. Additionally, 30 people (23.1%) responded in semesters 7-8, 14 people (10.8%) in semesters 3-4, 14 people (10.8%) in semesters over 8, and the fewest, 11 people (8.5%), in semesters 1-2. According to Province of origin, 78 respondents, or 60% of the total, were from Papua. Then came 23 individuals (17.7%) from Mountainous Papua, 13 individuals (10%) from Central Papua, 8 individuals (6.2%) from West Papua, and 7 individuals (5.4%) from South Papua.

### *3.2 Factor loading (FL) and Variance Inflation Factor (VIF)*

Evaluating convergent validity and potential multicollinearity is a crucial step in testing a PLS-SEM-based measurement model. Convergent validity is determined through factor loading (FL) values, where indicators with values above the 0.70 threshold are considered to adequately reflect the construct (Hair et al., 2021). Potential multicollinearity is tested using the variance inflation factor (VIF), with general criteria that a VIF <10 is acceptable (Hair et al., 2021), a VIF <5 is more conservative (Kock & Lynn, 2012) , and a VIF <3 is considered an indicator of the absence of serious lateral collinearity problems Diamantopoulos, (2006). Although classical references such as Diamantopoulos (2006) and (Kock & Lynn, 2012) and are widely used to assess VIF thresholds, recent literature provides a more flexible understanding. Studies by Becker et al., (2023), Streukens & Leroi-Werelds, (2023), and Vaithilingam et al., (2024) confirm that in the context of PLS-SEM, VIF values slightly above 5 are still acceptable, as long as the indicators have a strong theoretical basis and do not exhibit extreme redundancy. This new approach enhances instrument validation and ensures that model analysis remains robust despite potential collinearity. The following are the results of factor loading and variance inflation factor tests.

**Table 3.** Factor loading (FL) and Variance Inflation Factor (VIF)

| Constructs | Item Coding | LE | LS | LTS | SLM | VIF |
|---|---|---|---|---|---|---|
| Learning environment | LE.1 | 0.757 | | | | 1.895 |
| | LE.2 | 0.876 | | | | 3.049 |
| | LE.3 | 0.900 | | | | 3.639 |
| | LE.4 | 0.858 | | | | 3.006 |
| Learning style | LS.1 | 0.780 | | | | 1.891 |
| | LS.2 | | 0.803 | | | 1.881 |
| | LS.3 | | 0.847 | | | 2.072 |
| | LS.4 | | 0.820 | | | 1.738 |
| | LS.5 | | 0.702 | | | 1.346 |

| | | | |
|---|---|---|---|
| Lecturer Teaching Strategy | LTS.1 | 0.919 | 5.201 |
| | LTS.2 | 0.933 | 6.804 |
| | LTS.3 | 0.923 | 5.941 |
| | LTS.4 | 0.907 | 5.099 |
| | LTS.5 | 0.865 | 3.094 |
| | LTS.6 | 0.928 | 5.931 |
| Student Learning Motivation | SLM.1 | 0.875 | 3.946 |
| | SLM.2 | 0.744 | 2.111 |
| | SLM.3 | 0.866 | 3.888 |
| | SLM.4 | 0.829 | 2.938 |
| | SLM.5 | 0.844 | 2.908 |
| | SLM.6 | 0.767 | 2.719 |
| | SLM.7 | 0.748 | 1.987 |

*Note: LE Learning Environment, LS Learning Style, LTS Lecture Teaching Strategy. SLM Student Learning Motivation*

The results presented in Table 3 indicate that all indicators have factor loading (FL) values above 0.70, suggesting that they meet the criteria for convergent validity. Regarding the variance inflation factor (VIF), most indicators are below the conservative threshold of 5, indicating that multicollinearity is not a significant concern in the measurement model. However, several indicators within the Lecturer Teaching Strategy (LTS) construct show VIF values slightly above 5, specifically LTS.2 (6.804) and LTS.6 (5.931). Although these values exceed the conservative threshold, they remain below the commonly accepted upper limit of 10, suggesting that the level of collinearity is still theoretically acceptable. Nevertheless, the potential presence of collinearity among these indicators should be taken into consideration.

These findings are consistent with recent studies that highlight the importance of examining lateral collinearity even when VIF values have not exceeded the critical threshold (Richter et al., 2022; Sarstedt et al., 2020). Overall, the results confirm that the constructs in the research model demonstrate strong convergent validity and do not exhibit serious multicollinearity issues. Therefore, the measurement model can be considered appropriate for subsequent analysis, including discriminant validity assessment and structural model testing.

### *3.4 Construct Validity and Reliability*

Construct validity and reliability were tested to ensure that the measurement model met the required psychometric standards. This assessment included composite reliability (CR), average variance extracted (AVE), and Cronbach's alpha to evaluate the internal consistency and convergent validity of each construct. Complete results are presented in Table 4.

**Table 4.** Construct Validity and Reliability

| Constructs | Cronbach's alpha | (rho_a) | (rho_c) | (AVE) |
|---|---|---|---|---|
| LE | 0.891 | 0.897 | 0.92 | 0.699 |
| LS | 0.804 | 0.812 | 0.872 | 0.632 |
| LTS | 0.964 | 0.965 | 0.97 | 0.824 |
| SLM | 0.887 | 0.892 | 0.915 | 0.642 |

*Note: Note: LE Learning Environment, LS Learning Style, LTS Lecture Teaching Strategy. SLM Student Learning Motivation, AVE Average Variance Extraction, rhoo_a,rho Composite Reliability*

Cronbach's alpha ranges from 0.804 to 0.964, composite reliability ranges from 0.872 to 0.971, and AVE ranges from 0.632 to 0.824, all of which indicate strong convergent reliability and validity. The

results indicate that the indicators are consistently presented, making them reliable and legitimate for use in more in-depth PLS-SEM analysis (Hair et al., 2021; Shrestha, 2021).

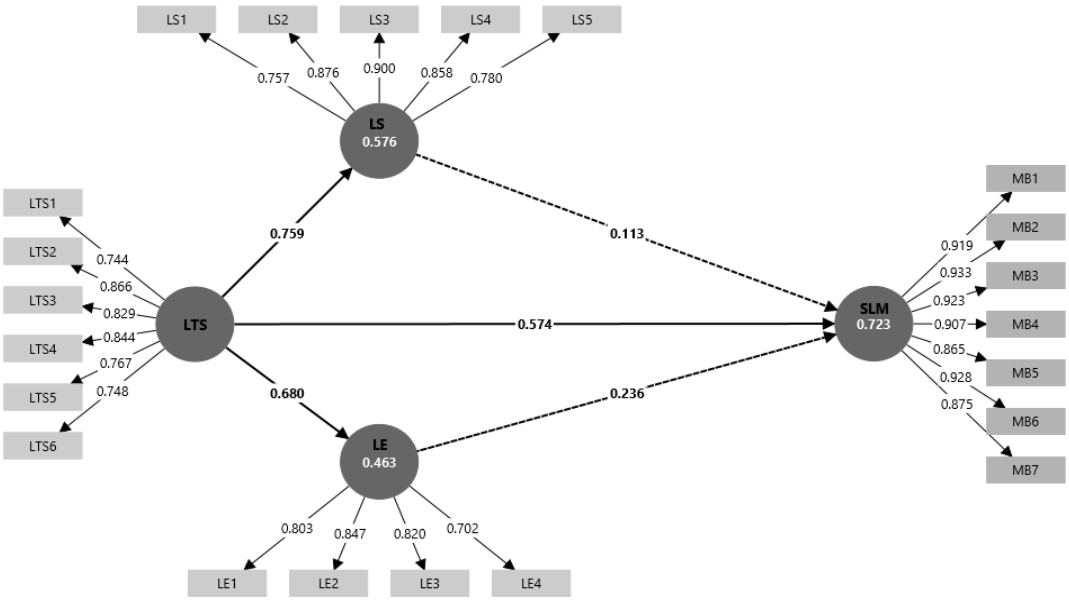


**Figure 1.** Measurement model

*Note: LE Learning Environment, LS Learning Style, LTS Lecture Teaching Strategy. SLM Student Learning Motivation*

The analysis results show that each indicator in this study has a loading factor value above 0.70, indicating that each construct has high validity. The $R^2$ value illustrates the predictive power of the model, with student learning motivation having a high value (0.723), Learning Strategy being in the medium category (0.576), and Learning Engagement also in the medium category (0.463). Based on the structural analysis, it was found that the Learning Teaching Strategy (LTS) had the strongest influence on Learning Strategy and Learning Engagement. Lecturers' teaching strategies were shown to directly encourage students to implement better learning strategies and increase their engagement in the learning process. In the long term, these teaching strategies also had a significant impact on increasing students' motivation for independent learning. Learning engagement made a moderate contribution to student learning motivation, while learning strategy had a relatively small influence on motivation for independent learning. These findings align with research by Zhang et al. (2024), who explained that teaching strategies can increase learning engagement through mediating emotional involvement in the context of online learning. This reinforces the findings of current research that teaching strategies implemented by lecturers can have a significant impact on student engagement and learning motivation. According to (Bergdahl et al., 2024; Geng et al., 2024), learning experiences that are influenced by strategy and learning outcomes significantly increase academic engagement through the use of self-efficacy as a mediator.

**Table 5.** HTMT analysis

| Constructs | Original sample (O) | Sample mean (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| LS <-> LE | 0.927 | 0.928 | 0.857 | 0.994 |
| LTS <-> LE | 0.792 | 0.794 | 0.691 | 0.886 |
| LTS <-> LS | 0.849 | 0.848 | 0.775 | 0.914 |
| SLM <-> LE | 0.809 | 0.810 | 0.729 | 0.883 |
| SLM <-> LS | 0.790 | 0.790 | 0.705 | 0.860 |
| SLM <-> LTS | 0.883 | 0.885 | 0.821 | 0.942 |

*Note: LE Learning Environment, LS Learning Style, LTS Lecture Teaching Strategy. SLM Student Learning Motivation, HTMT Heterotrait-Monotrait Ratio*

The results of the Heterotrait–Monotrait Ratio (HTMT) analysis presented in Table 5 indicate that most HTMT values are below the recommended threshold of 0.90, ranging from 0.790 to 0.927. Although the value for the LS–LE construct (0.927) approaches the upper threshold, the 97.5% confidence interval (0.994) remains below the critical value of 1.00, which suggests that discriminant validity can still be considered acceptable (Henseler & Schuberth, 2020). These results indicate that the constructs in the model are empirically distinct and that excessive overlap between constructs does not occur. Consequently, the discriminant validity of the measurement model is confirmed, strengthening the reliability of the measurement results.

These findings are consistent with recent research by Franke and Sarstedt (2021), which states that HTMT values below 0.90 generally indicate adequate discriminant validity in the context of PLS-SEM. Furthermore, earlier work by Franke and Sarstedt (2019) emphasizes that HTMT is a more reliable method than the Fornell–Larcker criterion for assessing discriminant validity, particularly in educational and managerial research contexts. According to Roemer and Schuberth (2021), within the PLS-SEM methodological framework, constructs can be considered empirically distinct when both the HTMT values and their confidence intervals do not exceed 1.00. Overall, the HTMT results demonstrate that each construct in the model possesses strong discriminant validity, supports the conceptual distinction among variables, and confirms that the measurement instrument is appropriate for subsequent structural model analysis.

### *3.5 Structural Model (SM) Analysis*

Structural models in PLS-SEM are used to test hypotheses by examining the path coefficient, t-statistic, standard error, and $R^2$. The path coefficient indicates the strength and direction of the relationship between variables, while the t-statistic and standard error are used to assess the significance and magnitude of the effect (Han, 2022). The $R^2$ value represents the proportion of variance in the dependent variable explained by the model, thus reflecting the model's explanatory power. To ensure the robustness of the findings, this study used a bootstrapping procedure with 5,000 resamples to test the significance of the hypothesized path. The hypothesis is considered supported at the 0.05 significance level if the t-statistic exceeds the critical value.

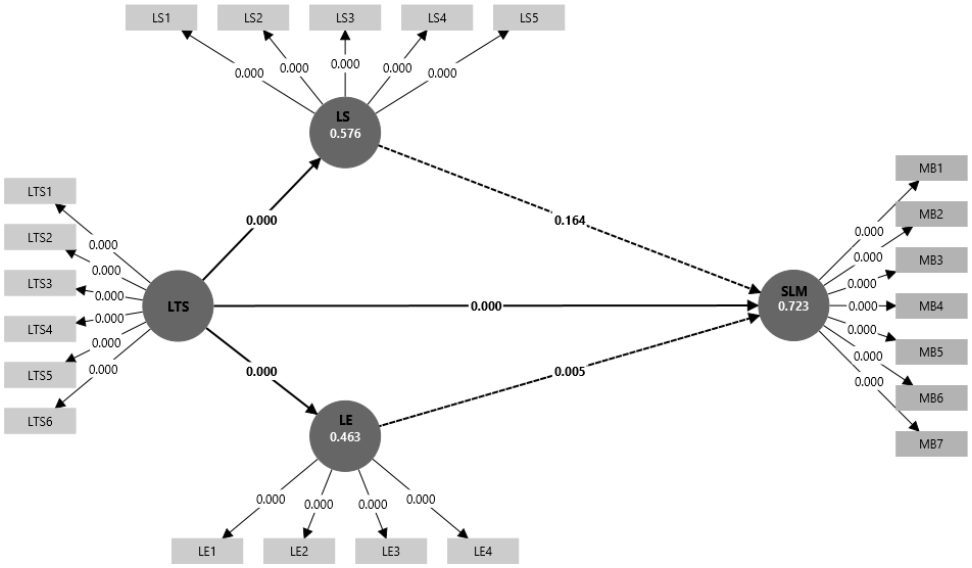


**Figure 2.** Structural Model and Hypothesis Testing Results Using PLS-SEM

### *3.6 Hypothesis testing*

**Table 6.** Hypothesis testing

| Constructs | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | Tstatistics (\|O/STDEV\|) | Pvalues | Decisions |
|---|---|---|---|---|---|---|
| LTS -> LS | 0.759 | 0.761 | 0.035 | 21.467 | 0 | Accepted |
| LTS -> SLM | 0.574 | 0.579 | 0.075 | 7.7 | 0 | Accepted |
| LTS -> LE | 0.68 | 0.685 | 0.043 | 15.796 | 0 | Accepted |
| LS -> SLM | 0.113 | 0.113 | 0.081 | 1.392 | 0.164 | Rejected |
| LE -> SLM | 0.236 | 0.232 | 0.083 | 2.833 | 0.005 | Accepted |
| LTS -> LS -> SLM | 0.086 | 0.086 | 0.063 | 1.37 | 0.171 | Rejected |
| LTS -> LE -> SLM | 0.16 | 0.158 | 0.055 | 2.888 | 0.004 | Accepted |

*Note: O Original Sample, M Sample Mean, STDEV Standard Deviation, \|o/STDEV\| T statistics, P Values. P < 0.05 (significant); P ≥ 0.05 (Not significant).*

The results of the hypothesis testing indicate that the Lecture Teaching Strategy (LTS) has the most dominant influence on Student Learning Motivation (SLM), both directly and through the mediation of Learning Environment (LE). Directly, LTS significantly increases SLM (O = 0.542, P = 0.000), while the learning environment also significantly influences SLM (O = 0.304, P = 0.000), indicating that a conducive learning environment can increase student motivation. In contrast, Learning Style (LS) does not significantly influence SLM (O = 0.059, P = 0.495), and the mediation path through LS is also insignificant (O = 0.043, P = 0.500), confirming that individual student learning styles are not effective mediators. The mediation path LTS -> LE -> SLM is significant (O = 0.196, P = 0.000), emphasizing the role of LE as the main mediator. These findings confirm that systematic teaching strategies of lecturers, combined with a supportive learning environment, are key factors in increasing student learning motivation, especially for indigenous Papuan students.

The hypothesis test results indicate that the Lecture Teaching Strategy (LTS) is a key component of the model. First, Learning Style (LS) (O = 0.759, t = 21.467, p < 0.001) and Learning Environment (LE) (O = 0.680, t = 15.796, p < 0.001) are both significantly impacted directly by LTS. This research reveals how instructors' methods can shape students' learning preferences and elevate the quality of their educational experiences. LS does not significantly affect SLM (O = 0.113, t = 1.392, p = 0.164), and the mediation path from LTS to LS to SLM is also not significant (O = 0.086, t = 1.370, p = 0.171). However, the direct effect of LTS on SLM is also significant (O = 0.574, t = 7.700, p < 0.001), suggesting that systematic and effective teaching strategies can directly encourage students' independent learning motivation. This result suggests that learning environment characteristics have a greater impact on SLM than students' individual learning styles, which do not significantly mediate the increase in independent learning motivation (O = 0.236, t = 2.833, p = 0.005). Furthermore, the LTS → LE → SLM mediation path was significant (O = 0.160, t = 2.888, p = 0.004), confirming the importance of the learning environment as a mediator in the link between student learning motivation and lecturer teaching tactics. The quality of a supportive learning environment can reinforce the effectiveness of instructional strategies in increasing students' motivation for self-directed learning. These findings suggest that LTS plays a major role in raising student motivation for learning, both directly and through LE mediation. Learning styles play a more individual function and are minor predictors because LS contributes little.

These results are in line with recent research that underscores how teaching arrangements and pedagogical tactics shape academic motivation in higher education. According to Y. Wang et al. (2024), motivating versus demotivating teaching styles, planned, adopted, and perceived are significantly associated with student motivation and well-being. Similarly, Zhou (2025) demonstrated that teaching

style affected classroom engagement among EFL learners, mediated by students' self-efficacy. These results reinforce global empirical evidence about the importance of pedagogy and learning ecology in higher education by confirming that structured lecturer teaching strategies and a supportive learning environment are the primary factors that increase students' motivation for independent learning, while individual learning styles do not significantly affect this outcome.

The finding that Learning Styles (LS) do not significantly influence Student Learning Motivation (SLM) suggests that the traditional concept of learning styles may no longer be a powerful construct in explaining learning motivation in today's higher education context. Several recent studies have shown that learning style theories tend to be outdated and empirically weak. (Hattie & O'Leary, 2025; Papadatou-pastou et al., 2021; Rogowsky et al., 2020). The idea that tailoring teaching methods to individual learning preferences (such as visual, auditory, or kinaesthetic) will improve learning outcomes is now widely questioned. In modern learning contexts that emphasize flexibility, collaboration, and the use of digital technology, students tend to adapt to a variety of learning styles, rather than a single style. This diminishes the relevance of learning styles as predictors of motivation.

In a cultural context, these insignificant results may also reflect the characteristics of native Papuan students who have collective and contextual learning patterns. (Fiharsono et al., 2024). In the cultural context, the nonsignificant result reflects the characteristics of indigenous Papuan students, who exhibit a collective and contextual learning pattern. Their learning process is shaped more by social interaction, relationships with authority figures such as lecturers, and the contextual relevance of the material rather than by individual preferences. Thus, Western-based learning style models appear culturally misaligned with the communal and relational learning realities of Papuan students. Within the framework of Self-Determination Theory (SDT) (Ryan & Deci, 2020), the present findings demonstrate that effective teaching strategies and a supportive learning environment play a pivotal role in satisfying students' three fundamental psychological needs: autonomy, competence, and relatedness, which collectively drive intrinsic motivation. Autonomy is fostered when lecturers adopt student-centered pedagogies that encourage voice, choice, and contextual engagement, allowing learners to link academic content with their personal or cultural realities. In culturally communal contexts, such as among Papuan students, autonomy is often exercised collectively rather than individually, emphasizing shared agency and mutual support (Gay, 2018).

Competence is enhanced through structured feedback, culturally responsive scaffolding, and the use of contextualized materials that affirm students' abilities and cultural identities (Deci et al., 2017). Meanwhile, relatedness emerges from authentic, respectful relationships between lecturers and students, as well as from collaborative learning environments that value interdependence and collective achievement, key dimensions of indigenous learning systems (Niemiec & Ryan, 2009). These findings suggest that teaching strategies and learning environments that are both autonomy-supportive and culturally responsive not only satisfy basic psychological needs but also strengthen students' learning motivation. For educators, this underscores the necessity of professional development programs oriented toward need supportive pedagogy, empathy-based communication, and cultural inclusivity. Likewise, curriculum design should integrate indigenous perspectives and local wisdom to enhance the relevance, emotional connection, and sustainability of learning motivation in multicultural higher education contexts (Ladson-Billings, 2021).

Competence is strengthened through structured feedback, culturally responsive scaffolding, and contextualized materials that validate students' abilities and identities (Deci et al., 2017). Relatedness is fostered through respectful lecturer-student relationships and collaborative learning environments that reflect Indigenous values of interdependence (Niemiec & Ryan, 2009). Together, autonomy-supportive and culturally responsive teaching practices fulfill basic psychological needs and enhance student motivation. This highlights the need for professional development focused on need-supportive pedagogy and culturally inclusive communication, as well as curriculum designs that integrate Indigenous perspectives to sustain motivation in multicultural higher education (Ladson-Billings, 2021).

This study has several limitations. Data drawn from a single faculty constrain the generalizability of findings, particularly given the distinct cultural characteristics of Indigenous Papuan learners. The cross-sectional design also limits the ability to observe changes in motivation over time, and self-report measures may introduce response bias. Future research should employ multi-site, longitudinal, and mixed-methods approaches to strengthen external validity and capture developmental shifts in motivational processes. Further studies are needed to test whether these patterns hold across different universities and Indigenous communities. Considering the nonsignificant role of learning styles, future work might examine alternative constructs such as cultural learning orientations, digital learning readiness, or communal learning behaviors. Qualitative investigations could also provide deeper insight into how culturally responsive teaching can be effectively implemented within multicultural higher education settings.

## 4. CONCLUSION

The findings reveal that Lecturer Teaching Strategy (LTS) is the strongest determinant of Student Learning Motivation (SLM) among Indigenous Papuan students, both directly and indirectly through the Learning Environment (LE). Learning Style (LS) showed no significant effect, suggesting that structured pedagogical design and socially supportive environments outweigh individual learning preferences in influencing motivation within collectivist contexts such as Papua. For higher education institutions, these results underscore the need to integrate contextual and culturally responsive pedagogy, align learning materials with students' sociocultural realities, and strengthen Indigenous student support mechanisms such as mentoring, peer learning, and culturally sensitive counseling. Lecturer professional development programs should emphasize inclusive and autonomy-supportive teaching practices that enhance engagement and motivation across diverse student groups. This study is limited by its cross-sectional design and focus on a single regional population, which may constrain generalizability. Future research should employ longitudinal tracking to examine motivational changes over time, include comparative analyses across faculties and universities, and use qualitative approaches to explore students' lived experiences and cultural perspectives on motivation.

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