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EFFECTS OF INDIGENIZED LEARNING TASKS ON THE STATISTICS PERFORMANCE OF GRADE 11 LEARNERS

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ABSTRACT

This quasi-experimental study investigated the effects of indigenized learning tasks on the statistics performance of Grade 11 learners at Alimodian National High School during the School Year 2025-2026. Participants were match-paired into experimental and control groups of 30, with the experimental group utilizing indigenized learning tasks while the control group followed traditional methods over a six-week period. Data were gathered through a validated researcher-made test and analyzed using mean, standard deviation, and t-tests utilizing IBM SPSS Statistics (version 31) at a .05 alpha level. Results revealed that both groups initially exhibited "low" performance levels with no significant difference. However, while both improved to "moderate" levels post-intervention, the experimental group achieved a significantly higher mean gain than the control group. The study concludes that indigenized learning tasks are more effective than traditional methods for improving performance and motivation through culturally relevant content. It is recommended that teachers integrate diverse indigenized techniques alongside traditional methods, supported by school administrators through improved facilities and further research into refined teaching strategies.

KEYWORDS: *Indigenized Learning Tasks, Statistics Performance, Grade 11 Learners, Quasi-Experimental Research, Culturally Relevant Pedagogy*

1. INTRODUCTION

Filipino learners frequently demonstrate limited statistical literacy, often struggling to implement logical reasoning within practical, real-world scenarios (Reston, 2023). This lack of engagement is typically driven by statistics-related anxiety and a general disinterest in abstract theoretical concepts, which highlights a significant disconnect between rigorous curricular expectations and actual learner motivation (Capistrano & de la Fuente, 2020). Learners specifically face difficulties with complex topics such as probability, the nature of randomness, normal distributions, and hypothesis testing, often finding it taxing to memorize formulas or perceive the relevance of these principles to daily life (Batan, 2020).

Traditional mathematics instruction in many Philippine schools frequently prioritizes the rote memorization of formulas over the cultivation of conceptual understanding and critical thinking, which ultimately impedes students' ability to engage in statistical reasoning and solve complex problems (Reston, 2023). This issue is compounded by the challenges teachers face, including insufficient content knowledge, a lack of professional training in effective pedagogical strategies, and a scarcity of high-quality instructional materials (Batan, 2020). To counter the misconception that mathematics is culture-neutral, the integration of culturally centered mathematics recognizes diverse epistemologies and empowers learners by validating their unique cultural knowledge and lived experiences as classroom assets (Nolledo, 2021). By incorporating these inclusive practices, educators can help bridge academic disparities, particularly for learners from Indigenous groups (de la Fuente, 2019).

Learners in Alimodian, Iloilo, frequently encounter challenges with "higher-order" statistical competencies, particularly in data analysis and interpretation, which often leads to performance levels below standard mastery. Conventional teaching methods often fail to bridge the gap between basic computation and complex problem-solving for marginalized or indigenous learners. Furthermore, educators in the Division of Iloilo report a significant lack of learning resources tailored to the specific needs of these learners. Although the curriculum mandates indigenization through initiatives such as the Indigenous Peoples Education (IPEd) program of the Department of Education Division of Iloilo, there remains a critical shortage of validated modules and learning tasks available for actual classroom implementation.

This study replaces traditional teaching with indigenized learning tasks to bridge the statistics proficiency gap among Filipino learners. By integrating local data and culture, these tasks provide a pedagogical scaffold that simplifies complex concepts while preventing cultural erasure. This approach gives teachers immediate tools to improve outcomes and fosters learner confidence within a meaningful, data-literate environment.

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2. RELATED STUDIES

The 2024 Functional Literacy, Education, and Mass Media Survey (FLEMMS) from the Philippine Statistics Authority indicates that only 79% of senior high school graduates are functionally literate, with the ability to perform basic math and apply comprehension skills to daily life. This data highlights that 21% of graduates struggle to apply these skills in real-life contexts, highlighting a need for educational reform. Additionally, Commission on Education (EDCOM 2), reports a staggering decline in student proficiency as learners progress through the Philippine education system. Analysis of standardized assessments from 2023 to 2025 reveals that while 30.52% of Grade 3 students are considered proficient in foundational literacy and numeracy, this figure plummets to a negligible 0.47% by Grade 12. The report suggests that the current 75% passing benchmark may unrealistically define "proficiency," yet the data fundamentally highlights a systemic failure to sustain learning gains, leaving the vast majority of high school learners well below national standards. Furthermore, the Programme for International Student Assessment (PISA, 2022) highlights that Filipino students often struggle to apply statistical reasoning in real-world contexts. Apino, et al. (2024) argued that the increasing demand for statistical literacy is driven by the rapid expansion of data availability, requiring individuals to develop higher-order thinking skills. The research underscores the need for a strengthened approach to statistical education that fosters deeper conceptual understanding rather than rote memorization (Teng et al., 2024; Callingham & Watson, 2017).

Research shows that Filipino students frequently struggle with statistical literacy, finding it difficult to use statistical reasoning in real-world situations (Reston, 2023; Repedro & Diego, 2021). This issue is compounded by a reliance on traditional teaching methods that prioritize rote memorization over deep conceptual understanding, which stifles the development of critical thinking (Sharma, 2017). Given this environment, there is a pressing need for targeted interventions within teacher training programs to ensure the next generation of educators is equipped to improve statistical education. Although mathematics education is a broad field of study, there is still a critical lack of research on how teacher education students in developing nations like the Philippines master and implement statistical concepts (Tintle et al., 2018; Dong et al., 2020). This knowledge gap is intensified by systemic hurdles, including insufficient training and overwhelming workloads, which compel teachers to adopt resourceful methods like contextualized instruction to overcome learning barriers (Magallanes, 2022). Given that proficiency in Statistics and Probability also hinges on emotional resilience and external support (Aballe, 2025), investigating these specific research gaps is essential for developing curricula that equip future teachers with both deep statistical literacy and the adaptability needed for the classroom.

Beting (2024) observes that while Statistics and Probability courses meet academic standards, students often fail to move beyond basic cognitive levels, suggesting a need for assessments rooted in real-world contexts to encourage higher-order thinking. This is supported by Tabuena and Hilario (2021), who argue that achieving deep cognitive engagement necessitates rigorous methodological preparation and the use of specific analytical frameworks to extract meaningful data insights. Together, these studies imply that success in data-centric subjects is a product of both curriculum alignment and disciplined research design. Furthermore, Calma et al. (2022) found that while Senior High School students are often intrigued by the subject, they also experience significant anxiety, leading to poor performance in foundational areas.

Morata and Poblete (2024) and Garcia and Pantaleon (2025) underscore the significant difficulties students face in mastering statistics, noting that a disconnect between theoretical knowledge and practical literacy often hinders academic success through struggles with data summarization and complex inferential tools. This challenge is further complicated by Quinio and Cuarto (2023), who point out that senior high school students also face deep-seated misconceptions and procedural errors stemming from internal barriers and the disruptions of pandemic-era modular learning. In response to the shift toward blended learning, De Las Peñas et al. (2021) emphasize that performance-based summative assessments must be adapted to maintain curriculum integrity while addressing the unique educational challenges of a post-pandemic landscape. Building on this need for innovative pedagogy, Tagalicud and Acosta (2024) propose the integration of Design Thinking-based Lesson Plans (DTLPs) to target core competencies in Statistics and Probability, advocating for professional development and curriculum reform that foster critical thinking and empathy in students.

Modern statistical education in the Philippines is increasingly defined by the integration of accessible technology and targeted instructional strategies to bridge learning gaps. Tolentino et al. (2023) highlight the importance of low-cost mobile tools and apps like GeoGebra to enhance engagement and proficiency through practical classroom applications. This technological focus is complemented by specific pedagogical interventions, such as the Magnified Math Solutions Strategy, which Nuera (2025) found to improve both academic scores and metacognitive reflection, even within distance learning constraints. Furthermore, Sabudan and Saquido (2025) demonstrate that software-driven seminars, specifically using JASP, can dramatically elevate student proficiency from poor to satisfactory levels while boosting confidence in data analysis. Recent research highlights that academic success in diverse educational settings is deeply tied to both individual study habits and the implementation of culturally responsive instruction. Casinillo (2024) demonstrates that students can maintain productive routines in statistics even during distance education when supported by optimal environments and technology access. This individual resilience is mirrored at the institutional level by educators who, despite a lack of resources, support Indigenous Peoples (IP) learners by indigenizing curricula with local languages and knowledge systems to foster inclusivity (Gonzales, 2025). Furthermore, Lumayas and Brazil

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(2026) show that when IP students see their identities reflected in classroom content, it acts as a powerful catalyst for engagement and growth, enabling them to overcome linguistic and structural barriers with adaptive determination.

The successful implementation of Indigenous Peoples Education (IPEd) is currently hampered by a systemic disconnect between institutional frameworks and the cultural and economic realities of indigenous communities. Research by Oxtero (2022) and Saavedra et al. (2025) underscores that a lack of specialized teacher training, scarcity of indigenized materials, and the immediate survival needs of families often prioritize labor over consistent schooling. These hurdles are compounded by cultural marginalization and financial hardships during the transition back to face-to-face learning; however, indigenous students continue to demonstrate profound resilience through peer support and agency (Gaite, 2025). To preserve endangered traditions like those of the Gaddang and Yogad, researchers such as Parallag (2022) advocate for the creation of instructional materials that integrate local folklore and rituals while remaining aligned with national standards.

Culturally Relevant Pedagogy (CRP) serves as a transformative educational framework that prioritizes the integration of students' unique cultural backgrounds and lived experiences into the instructional process (Prayitno et al., 2024). In mathematics specifically, the implementation of indigenized practical tasks significantly improves indigenous students' learning behavior and performance by fostering higher levels of engagement, motivation, and real-world application (Pelenio & Bacabac, 2024). This pedagogical shift is further supported by the high self-efficacy of mathematics teachers who successfully utilize localized examples and native languages to tailor their methodologies to diverse cultural contexts (Edilo et al., 2022).

Contextualized and localized instruction serves as a powerful catalyst for enhancing student engagement and academic mastery in mathematics by bridging the gap between abstract concepts and lived experiences. Landas and Alova (2022) demonstrate that localized lesson plans significantly outperform standardized materials, with students exhibiting a threefold improvement in performance and a heightened interest in the subject. This effectiveness is reinforced by Buyco and Dalayap (2025), who found that integrating culturally relevant games and practical applications boosts motivation and conceptual grasp, regardless of a student's specific ethnicity. However, the successful delivery of such indigenized instruction is often limited by a scarcity of resources and specialized training for teachers (Nangpuhan & Asuncion, 2024).

Achieving success in Statistics and Probability requires addressing both systemic instructional barriers and the integration of culturally relevant content. Cotejar and Lastierre (2025) point out that student performance is often hindered by difficulties in formulaic computation and suboptimal classroom environments, suggesting a universal need for enhanced teacher competence and revised instructional strategies. To address these pedagogical gaps, Balbawang and Felix (2023) demonstrate that incorporating indigenous games significantly boosts mathematical scores, effectively bridging the gap between formal curriculum and local culture. Furthermore, Kalsi and Dhillon (2025) argue that integrating Indigenous Knowledge Systems (IKS) into STEM education not only fosters higher-order thinking skills (HOTS) but also promotes educational equity for marginalized communities.

The integration of culturally relevant activities and materials is a powerful catalyst for enhancing student performance across various grade levels and competencies. Jemimah et al. (2024) demonstrate that indigenous games significantly strengthen foundational skills like spatial awareness and pattern recognition in early childhood education, fostering a curriculum that is both mathematically sound and culturally meaningful. This success is echoed in the elementary setting by Balingway and Felix (2025), who found that contextualized worksheets outperform traditional lectures, prompting a call for educators across disciplines to adopt similar localized strategies. However, Llagas and Trimillos (2024) note that the mainstreaming of these practices remains limited in areas like health and nutrition, often hindered by large class sizes.

The implementation of contextualized and localized instruction significantly enhances student engagement, academic achievement, and conceptual understanding in mathematics by grounding abstract concepts in real-world scenarios. Research by Fabrigas and Taban (2023) indicates that educators in the El Nido districts of Palawan have successfully adopted these strategies despite significant hurdles, such as linguistic diversity and limited technological resources. Specific interventions, including localized worktexts for Grade IV learners in CALABARZON (Fabia, 2025) and Contextualized Learning Activity Sheets (CLAS) for Grade 9 students (Paguia & Montero, 2026), have demonstrated substantial improvements in numeracy scores and deeper mastery of mathematical principles. Furthermore, Molanda et al. (2024) characterize contextualization as a vital bridge between a student's community experience and classroom instruction, emphasizing that creative teacher resourcefulness is essential to fostering a sense of belonging and making mathematics culturally relevant.

Integrating contextualized and localized instructional strategies significantly boosts critical thinking and conceptual mastery by rooting abstract lessons in the student's personal and community experiences. Manjares and Pasia (2023) emphasize that these relatable environments particularly benefit kinesthetic learners, while Adonis (2020) demonstrates that researcher-developed Contextualized Strategic Intervention Materials (CSIMs) produce meaningful learning gains across both formative and summative assessments. Furthermore, research by Garin (2016; 2017) suggests that combining localization with indigenization leads to superior student attitudes and academic outcomes compared to traditional methods. This transformative impact is further

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validated by Moyano and Andrade (2025), whose work on Place-Based Education (PBE) shows that using the local community as a primary resource can elevate problem-solving skills from unsatisfactory to excellent levels.

3. OBJECTIVES

This study aimed to determine the influence of indigenized learning tasks on the statistics performance of Grade 11 learners at Alimodian National Comprehensive High School for the School Year 2025-2026. Specifically, the research sought to establish a baseline by describing and comparing the pretest performance of learners both with and without exposure to indigenized learning tasks. It further aimed to evaluate the posttest performance of both groups to identify any significant differences in achievement following the intervention. Additionally, the study intended to measure the statistical growth within each group by comparing their respective pretest and posttest results. Ultimately, the research aimed to compare the mean gain scores of the two groups to determine if the use of indigenized learning tasks significantly enhanced learner performance compared to traditional instructional methods.

4. THEORETICAL FRAMEWORK

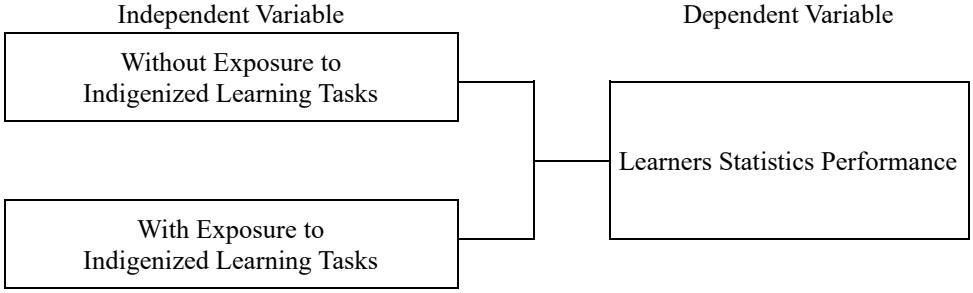
This study is Anchored in Gloria Ladson-Billings' (1995) theory of Culturally Relevant Pedagogy (CRP) which advocates for the integration of learners' cultural backgrounds, prior knowledge, and lived experiences into the instructional process to provide a pedagogical justification for indigenized learning tasks. CRP posits that statistics education should transcend mere technical proficiency by fostering a sense of belonging and critical awareness through three core tenets: academic success, cultural competence, and sociopolitical consciousness. To ensure academic success, this research moves beyond rote memorization toward deep statistical literacy, utilizing scaffolding to bridge the gap between learners' existing knowledge and complex concepts like probability and inference. Cultural competence is addressed by replacing generic textbook examples with indigenized data such as local public health statistics, traditional games, or community delicacies thereby validating the learners' identities and framing their backgrounds as academic assets. Finally, the study promotes sociopolitical consciousness by empowering students to use statistical reasoning as a tool for social change, encouraging them to critique data sources, identify inherent biases, and analyze real-world inequalities. By linking new information to existing mental schemas through personally meaningful, indigenized content, CRP facilitates a more efficient learning process that ultimately drives higher student engagement and superior academic performance in statistics.

5. CONCEPTUAL FRAMEWORK

The conceptual framework interrelatedness of the key variables in this study is illustrated in the research paradigm shown in Figure 1.

Figure 1

Schematic Diagram Showing the Relationship Among Variables of the Study



The paradigm of the study reveals how indigenized learning tasks influences the performance of learners in statistics. The independent variable sets up with indigenized learning tasks and without indigenized learning tasks while the dependent variable is the statistics competencies of Grade 11 learners of Alimodian National Comprehensive High School during the School Year 2025-2026.

6. METHODOLOGY

6.1 Research Design

This study utilized a pretest-posttest equivalent control group quasi-experimental design to evaluate the impact of indigenized learning tasks on the statistics performance of Grade 11 learners at Alimodian National Comprehensive High School during the School Year 2025-2026. The research was conducted in three distinct stages: a baseline assessment where both the experimental and control groups completed a pretest, a treatment phase where the experimental group was instructed using indigenized learning tasks while the control group utilized conventional materials, and a final stage where a posttest was administered to measure achievement. By measuring statistics performance as the dependent variable both before and after the intervention, the study determined how exposure to indigenized learning tasks influenced learners' performance compared to traditional instructional methods.

6.2 Participants of the Study

The participants for this study consisted of two heterogeneous sections of Grade 11 learners at Alimodian National Comprehensive High School for the School Year 2025-2026. To ensure data integrity, learners with extreme grades were excluded as outliers, which resulted in a final selection of 30 participants per section. The control and experimental groups were designated

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using the fishbowl method. Both groups shared similar cultural backgrounds and common challenges in traditional mathematics, such as low engagement with abstract statistical concepts. To eliminate instructional bias and avoid variations in delivery, the researcher personally handled and taught both groups. Table 2 presents the distribution of the participants.

Table 2

Distribution of the Participants

Category	*n*	*%*
With indigenized learning tasks	30	50
Without indigenized learning tasks	30	50
Total	60	100

6.3 Data Gathering Instrument

This study utilized two instruments namely: researcher-made statistics test and indigenized learning tasks. The researcher-made statistics test served as the central tool for evaluating the Grade 11 learners' statistics performance. This 40-item multiple-choice test, which awarded one point per correct response, focused on key fourth-quarter competencies which include: sampling distributions and hypothesis testing. To ensure curricular alignment and content validity, the researcher utilized a Table of Specifications (TOS) and strictly followed the K to 12 Statistics and Probability curriculum guide during the test's construction. The second instrument was the indigenized learning tasks in statistics. For sampling and sampling distribution, the tasks involved learners conducting surveys of traditional resources while for tests of hypothesis, they investigated the validity of traditional ecological knowledge by formulating hypotheses that compare these indigenous claims against modern datasets. These tasks were made to ensure that statistical literacy is developed through the lens of community relevance and cultural preservation.

The test and indigenized tasks were submitted to a panel of jurors for face and content validity. The panel was composed of experts in the field of statistics, indigenous and local knowledge, test construction, and instruction and evaluation. After the panel validation, the tasks were revised while the test instrument was modified as suggested by the jurors before it was pilot-tested for reliability. The reliability of the test instrument was 0.842. This value was considered a good researcher-made test (Quaigrain & Arhin, 2017).

6.4 Data Gathering Procedure

The researcher sought permission from the Schools Division Superintendent of the Schools Division of Iloilo. The approved copy of the letter was furnished to the school principal of Alimodian National Comprehensive High School. Then, the researcher sought the permission to conduct the study from the school principal. Before the study was conducted, the learners were informed about the nature of the study and was requested to cooperate. Learners who were below 18 were given a consent form for their parents or guardians to signed allowing them to participate in the said study. To determine group assignments, the fishbowl method was used to select two sections of 30 Grade 11 learners each. Over six weeks, both groups covered the same fourth-quarter statistics unit from Monday to Thursday, receiving one hour of instruction per session. The control group (7:30–8:30 AM) received traditional instruction, while the experimental group (8:30–9:30 AM) used indigenized tasks. Identical pretests and posttests were administered to both groups for statistical analysis.

The study followed a three-phase experimental design: pre-experimental, experimental proper, and post-experimental. It started with an orientation for Grade 11 learners on the procedures and the use of indigenized versus non-indigenized learning tasks. Following a pre-test, both groups underwent a six-week, 24-hour instructional phase covering the same K-12 statistics curriculum, with the control group receiving traditional instruction while the experimental group utilized daily indigenized learning tasks. Immediately following this phase, a posttest was administered to both groups to measure the treatment's effect, after which learner responses were evaluated and processed for comprehensive analysis and interpretation.

6.5 Data Processing Techniques

The data gathered in this study were analyzed using IBM SPSS Statistics (Version 31.0) with the alpha level set at .05 for all significance tests. Descriptive statistics, specifically the mean and standard deviation, were employed to describe the level of statistics competencies among Grade 11 learners and to assess the homogeneity of the performance test scores. Mean scores were interpreted using a five-point scale: 32.01–40.00 (Very High), 24.01–32.00 (High), 16.01–24.00 (Moderate), 8.01–16.00 (Low), and 0.00–8.00 (Very Low). To address the research hypotheses, an independent samples t-test was used to compare mean differences between the two learner groups, while a dependent samples t-test was utilized to evaluate significant changes within a single group over two time periods.

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7. RESULTS AND DISCUSSIONS

Table 3

Pretest Statistics Performance of the Learners With and Without Exposure to Indigenized Learning Tasks

Group	*N*	*M*	*SD*	Description
With Indigenized Tasks	30	11.933	2.392	Low
Without Indigenized Tasks	30	12.567	3.277	Low

Note: 32.01-40.00 "Very High", 24.01-32.00 "High", 16.01-24.00 "Moderate", 8.01-16.00 "Low", 0.00-8.00 "Very Low"

The result presented in table 3 showed that the pretest Statistics performance of the learners without indigenized tasks was considered "low" (M = 12.567, SD = 3.277). The same result was noted to the learners with indigenized tasks which was considered "low" (M = 11.933, SD = 2.392). Both groups demonstrated equivalent baseline knowledge, suggesting they were equally unexposed to the competencies prior to the treatment.

Learners initially performed poorly on pretests due to a lack of exposure to the required competencies, a finding consistent with the role of pretests in establishing knowledge baselines and identifying academic gaps. As Llagas and Trimillos (2024) observe, while pretests often cover material students are not yet expected to master, they serve as essential motivational "road maps" that ultimately improve overall performance. This initial low achievement was also reflected in the study by Jemimah et al. (2024), where learners in both experimental and control groups failed to reach expected competency levels in statistics before the intervention. Such low scores highlight the need for tailored academic attention and innovative instructional strategies to support learners who begin the course at a low performance level

Table 4

Comparison of Pretest Statistics Performance Between Learners With and Without Indigenized Learning Tasks

Group	*M*	*SD*	*df*	*t*	*p*
With Indigenized Tasks	11.933	2.392	58	0.855	.396
Without Indigenized Tasks	12.567	3.277			

p>.05 not significant

As shown in table 4, there was no significant difference on the pretest of the statistics performance of the learners with and without indigenized learning tasks (t[58] = 0.855, p = .396). This result shows that learners' statistics performance before the intervention are the same. The experimental group and control group's pretest academic achievement scores were close to each other. Both groups were comparable in terms of their statistics performance. This meant that the learners with and without indigenized learning tasks were on equal level of achievement before the intervention. The match-pairing which was done before the intervention using the learners third quarter grade in statistics ensures that the learners in both group must be identical when it comes to their statistics performance at the beginning of the study supported this result.

These findings align with Kalsi and Dhillon (2025), whose research on indigenized tasks addressed potential pre-existing performance differences between experimental and control groups. Similarly, the results correspond with Moyano and Andrade (2025), which demonstrated that pretest mean scores between the two groups were not significantly different.

Table 5

Posttest Statistics Performance of the Learners With and Without Indigenized Learning Tasks

Group	*N*	*M*	*SD*	Description
With Indigenized Tasks	30	21.600	3.297	Moderate
Without Indigenized Tasks	30	17.933	2.728	Moderate

Note: 32.01-40.00 "Very High", 24.01-32.00 "High", 16.01-24.00 "Moderate", 8.01-16.00 "Low", 0.00-8.00 "Very Low"

The posttest results indicated that students taught with indigenized learning tasks achieved a "moderate" performance level (M = 21.600, SD = 3.297), as did those taught without such tasks (M=17.93, SD = 2.73).The result shows an increase in the level of learner's statistics performance.

While both teaching methods effectively improved statistics performance, learners exposed to indigenized learning tasks achieved significantly higher and more consistent results than those taught without indigenized learning tasks. This suggests that while alignment with core competencies is essential for growth, selecting culturally relevant strategies specifically tailored to the learners is the key to maximizing their academic potential.

The result of the study is supported by the research conducted by Garin, et al. (2017). In their study regarding the posttest statistics performance of learners, students exposed to both instruction

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generally achieved higher overall performance. Adonis (2020) added that even initial pre-test scores showed no significant difference between the groups, the integration of indigenized learning tasks led to significantly superior results during the posttest phase.

Table 6

Comparison of Posttest Statistics Performance Between Learners With and Without Indigenized Learning Tasks

Group	***M***	***SD***	***t***	***df***	***p***
With Indigenized Tasks	21.600	3.297	−4.693	58	<.001
Without Indigenized Tasks	17.933	2.728			

**p<.05-significant*

Table 6 showed that there is a significant difference in the posttest statistics performance of the learners with and without indigenized learning tasks (t[58]= -4.693, p<.001). The result shows different influence of the two teaching methodologies, with and without indigenized learning tasks, adopted for teaching statistics. This means that the participants with indigenized learning tasks performed better than the learners without indigenized learning tasks. The results revealed that the use of indigenized learning tasks in teaching statistics is more effective teaching technique compared to without indigenized learning tasks. The change of teaching methodology became a contributing factor in learners' statistics performance.

The findings of this study revealed similar results of Garin (2016), both the control and experimental groups demonstrated a marked improvement in their posttest results compared to their initial pretest scores, indicating that both instructional methods effectively enhanced student performance. However, Manjares and Pasia (2023) in their study revealed that the experimental group's post-test achievements were significantly superior to those of the control group, suggesting that the indigenized learning tasks used was more impactful than the traditional approach.

Table 7

Comparison of Pretest and Posttest Statistics Performance of Learners Without Indigenized Learning Tasks

Without Indigenized Tasks	*M*	*MD*	*df*	*t*	*p*
Pretest	12.567	−5.367	29	−9.444	<.001
Posttest	17.933				

**p<.05-significant*

Table 7 showed that there was a significant difference between the pretest and the posttest statistics performance of the learners without indigenized earning tasks (t[29] = -9.444, p<.001). Results indicate that teaching without indigenized learning tasks also positively impacts statistics performance. Utilizing familiar strategies like lectures, structured discussions and textbook tasks provide learners with a comfortable and organized learning environment. This traditional approach ensures systematic coverage of required competencies, fostering steady academic growth and foundational understanding.

These findings are consistent with Balingway and Felix (2025), who observed significant improvements from pretest to posttest in both study groups. While the control group's performance increase was statistically significant, it was ultimately considered marginal. In contrast, Molanda et al. (2024) found that the experimental group demonstrated a significant and more consistent rise in scores, suggesting that indigenized learning tasks serve as a more powerful intervention for enhancing learner performance than traditional instructional methods.

Table 8

Comparison of Pretest and Posttest Statistics Performance of Learners

With Indigenized Tasks	***M***	***MD***	***df***	***t***	***p***
Pretest	12.933	−9.667	29	−14.426	<.001
Posttest	21.600				

**p<.05-significant*

Table 8 showed that there was a significant difference between the pretest and posttest statistics performance of the learners with indigenized learning tasks (t[29] = -14.426, p < .001). The result showed a significant increase in the learners' performance taught with indigenized learning tasks as compared to their pretest. The mean difference of 9.667 shows that learners improve their statistics performance. It also shows that the learners taught using indigenized learning tasks gained more knowledge and understanding of the statistical concepts. The use of new methods of teaching like indigenized learning tasks has a positive influence to learner's performance. Learners' ability to learn increases as they enjoy and involve themselves in the learning process.

This is in line with the study of Pelenio and Bacabac (2024) which shows that indigenized learning tasks has a significant influence on the problem-solving ability of the learners. Landas and Alova (2022) added that the consistent integration of indigenized

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learning tasks significantly transforms student engagement and participation in the mathematics classroom. Paguia and Montero (2026) added that students initially displayed inattentiveness, the introduction of tasks rooted in cultural and real-life contexts fostered a newfound courage to participate, leading to active engagement, leadership behaviors, and increased enjoyment. Thus, indigenized learning tasks connects statistical concepts to the personal worlds of learners, fostering deeper understanding and improving statistical performance.

Table 9

Comparison of Mean Gain Statistics Performance Between Learners With and Without Indigenized Learning Tasks

Group	*M*	*MD*	*df*	*t*	*p*
With Indigenized Tasks	5.367	−4.300	58	−4.894	<.001
Without Indigenized Tasks	9.667				

**p<.05-significant*

The data showed that there is a significant difference in the mean gain statistics performance of the learners with and without indigenized learning tasks (t[58]= -4.894, p< .001). Results indicate that statistics performance improved across all participating learners, regardless of their exposure to indigenized learning tasks. Mean differences within each group confirm a post-experimental increase in overall achievement for the entire study population. However, learners exposed to indigenized learning tasks demonstrated significantly greater improvement compared to those in the non-exposure group. These findings suggest that active participation and engagement during the instruction process foster a deeper conceptual understanding than a passive one.

This result of the study was supported by the study Balbawang and Felix (2023) wherein learners who had undergone indigenization of activities greatly increase from pretest to posttest compared to the learners who had undergone the same traditional lecture method commonly used. Similarly, Fabia and Taban (2023) supports the results of their investigation indicating that there were significant differences in the achievement scores of students who were exposed to indigenized tasks compared to the lecture teaching and use of book based tasks.

8. CONCLUSIONS

The study established that both groups began with equivalent baseline competencies in statistics, sharing identical foundational knowledge and exposure to standard teaching protocols. While both instructional modalities successfully enhanced learner performance, those exposed to indigenized learning tasks demonstrated statistically superior growth compared to the control group. Although the traditional textbook-based approach remained a stable and effective pathway for learner improvement, the integration of culturally responsive tasks served as a vital bridge that affirmed learner identities and fostered deeper conceptual understanding. Ultimately, the results indicated that while mastery is achievable through various frameworks, culturally anchored strategies act as a significant catalyst for higher engagement and academic achievement in statistics.

9. RECOMMENDATIONS

To optimize the implementation of culturally responsive education, teachers should utilize indigenized tasks as instructional "hooks" while prioritizing the cultivation of positive student attitudes toward statistics. This shift from traditional models requires robust professional development for educators and the collaborative creation of localized worktexts by stakeholders to bridge existing resource gaps. Furthermore, political leaders and school administrators must provide the necessary funding, facilities, and structural support to empower teachers and ensure academic equity. Ultimately, future researchers are encouraged to use this study as a framework for developing inclusive instructional models that empower learners through their own cultural heritage and heritage-based knowledge.

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