# DEMOGRAPHIC PROFILE OF SENIOR HIGH SCHOOLS AS PREDICTOR OF GRADE 12 NATIONAL ACHIEVEMENT TEST (NAT) RESULTS: BASIS FOR AN INTERVENTION PROGRAM

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**ABSTRACT:** The National Achievement Test (NAT) revealed significant challenges for Grade 12 students in Negros Oriental Province, with overall performance classified as low proficient. While students showed stronger competencies in Philosophy, particularly in problem-solving and critical thinking, Mathematics and Science emerged as the most challenging subjects. Interestingly, although most examinees were from larger schools, no significant proficiency differences were observed based on school size, though a positive correlation was noted with future assessments. Performance varied by school type, with students from Public Science High Schools outperforming those from Public Comprehensive and Private High Schools. Geographically, students from first-class municipalities predominated, with Negros Oriental High School achieving the highest scores. Further analysis indicated that students from second-class and fourth-class municipalities outperformed peers from other classifications, highlighting a potential link between municipal class and student performance. Government support appears crucial, as proximity to the Municipal Hall correlated with better scores. Additionally, schools located near the National Highway also demonstrated improved performance. The study underscores the complex influences on student achievement in the NAT, including factors such as school size, type, municipality class, and geographical location, suggesting that targeted support could enhance educational outcomes in the region.

Keywords: NAT, National Achievement Test, Size of Examinees, Type of School, Class of Municipality, Congressional District, Distance from Municipal Hall, Distance from the National Highway

# **1. BACKGROUND OF THE STUDY**

The National Achievement Test (NAT) is conducted by the Department of Education (DepEd) in the Philippines to set standardized tests concerning the knowledge and skills they learned in major subject areas throughout the school year or the succeeding years. The tests are designed to assess whether the students are meeting the learning standards of the K to 12 Curriculum, considering the 21st Century Skills, namely, Problem Solving, Critical Thinking, and Information Literacy. The scores of these exams are the percentage of items answered correctly by the students.

The National Achievement Test for Grade 12, in accordance with DepEd Order No. 55, and managed by the Bureau of Education Assessment (BEA), is designed to assess senior high school graduating students' performance and whether this performance meets the learning standards. The subject areas considered are Humanities, Language and Communication, Mathematics, Media and Information Literacy, Philosophy, Science, and Social Science [5].

Researchers have analysed student performance in the National Achievement Test, examining various influencing factors. These include teacher-related factors, student-related factors, the nature of the assessment, and school and administrator-related factors. However, the geographical profile of the schools attended by these students has received limited attention in these studies.

DepEd recognizes the importance of system assessments like the National Achievement Test (NAT) in providing valuable feedback for informed policy decisions and educational reforms. The objectives of such evaluations, as outlined in DepEd Order No. 29, s. 2017, include the following: 1. Baseline Establishment - Define benchmarks for the basic education system and monitor the implementation of the K to 12 curriculum in teaching and learning; 2. Monitoring and Evaluation - assess the effectiveness of instructional reforms in the K to 12 program; 3. International Benchmarking - generate reliable data for global comparisons to identify areas requiring improvement; 4. Policy Support - provide evidencebased insights for policymaking, planning and programming at the division, regional, and national levels; 5. Improvement of Educational Programs - enhance learner development, curriculum implementation, and school effectiveness through data-driven interventions [15].

The 2023 Grade 12 National Achievement Test (NAT) serves as a crucial measure of student proficiency across Senior High Schools in the Division of the Province of Negros Oriental. This study aims to assess the proficiency levels of participating students, while also examining the demographic profiles of their schools, including factors such as school size, type, and geographical location. By investigating potential correlations between these demographics and student proficiency, the study seeks to identify significant differences and relationships that may inform educational strategies. Ultimately, the findings will contribute to the development of an intervention plan to enhance educational outcomes based on the observed results.

**2. REVIEW OF RELATED LITERATURE & STUDIES The National Achievement Test (NAT).** The National Achievement Test (NAT) is a standardized examination administered in the Philippines to students in Grades 3, 6, 10, and 12. Its purpose is to assess students' academic proficiency, strengths, weaknesses, and knowledge in core subjects learned throughout the school year. The NAT provides valuable insights into students' achievement levels, serving as a guide for principals and teachers in making informed decisions regarding instructional strategies. Additionally, the test analyzes trends in achievement levels over time across various regions, divisions, schools, and other factors. It also evaluates the progress of basic education by measuring improvements within individual schools over specific periods. [56, 58]. Administration of the National Achievement Test for Grade 12. The Department of Education (DepEd) conducted the National Achievement Test for Grade 12 (NATG12) for the School Year 2022-2023 on January 30 and 31, 2023, under DepEd Order No. 55, s. 2016, titled Policy Guidelines on the National Assessment of Student Learning for the K to 12 Basic Education Program. Grade 12 students enrolled in public and private schools during this school year took the test using a paper-based format. The NATG12 serves as one of the exit assessments under the K to 12 national assessment framework, aiming to evaluate whether graduating students meet the learning standards outlined in the Senior High School (SHS) curriculum. The results provide data on the proportion of Grade 12 learners achieving at least the minimum level of proficiency in the Stage 4 SHS core areas. The test assesses 21st-century skills along with core SHS learning areas, including Languages, Humanities, Communication, Mathematics, Science, Social Science, and Philosophy. Designed progressively, the test includes items that measure varying skill levels. The assessment is presented in both English and Filipino, with a multiple-choice format for the test items [2]. The Department of Education announced that the NATG12 would be implemented beginning in the academic year 2022-2023. The test follows a progressive design, with items assessing a range of skill levels. The assessment is conducted in English and Filipino, using a multiple-choice format. The Bureau of Education Assessment (BEA) oversaw the nationwide administration of NATG12, working closely with regional offices (ROs) and school division offices (SDOs). BEA also coordinated with designated field-testing sites to ensure proper implementation [40].

Performance of Students in NAT. 1. Performance Trends in the National Achievement Test (NAT): Nicolas-Victorino [41] revealed that public high schools in Santa Maria underperformed in the 2010-2011 National Achievement Test, with most schools ranking in the bottom half of the assessment results. Similarly, Sangalang and Badillo [50] found that schools in their study did not meet the passing rate of 75%, and the majority were placed in the lower half of the rankings. [50]. In the 2011-2012 NAT, the national Mean Percentage Score (MPS) average for high schools was 48.9%. Schools where teachers implemented teaching strategies, such as presenting concepts followed by examples and applications, showed higher MPS, such as 52.3% in Science, compared to the national average of 40.5%. Similar positive correlations were observed in Mathematics and English [54]. DepEd Cagayan Valley Regional Office (2018) reported that the NAT results for Grades 6, 10, and 12 consistently fell below the acceptable mastery level of 75%. Grade 6 students performed poorly across most subjects, with Filipino having the highest MPS and Science and English the lowest. Similar patterns were observed in Grades 10 and 12, with Mathematics and Science persistently recording the lowest scores. Across grade levels, 21st-century skills such as critical thinking consistently ranked lowest, while problemsolving skills scored relatively higher [18]. Bernales et al. [6] observed a steady decline in the NAT performance of Grade 6 students over three consecutive school years. The findings indicated performance levels described as "Closely

Approximating Mastery" and "Moving Towards Mastery." These results necessitated the development of a five-year strategic plan to improve instructional delivery and learning outcomes [6]. 2. Subject-Specific Performance Challenges: Namoco et al. [39] examined the SY 2017-2018 NAT results and highlighted subject-specific trends. Filipino and Araling Panlipunan consistently recorded the highest scores, while Mathematics and Science were the weakest subjects across all divisions. The study also found significant variations in performance depending on school size and location. The findings emphasized the importance of using the results to guide curriculum revisions and policy-making by the Department of Education [39]. Similarly, Quilnet and Batucan [48] evaluated the Basic Education Exit Assessment (BEEA) results, which showed that many students scored in the Highly Proficient or Nearly Proficient range for their overall percentile rankings. However, their MPS scores revealed a general lack of proficiency, particularly in key 21st-century skills such as problem-solving, information literacy, and critical thinking. Among the subject areas, Media and Information Literacy had the highest ratings, while Mathematics consistently showed the lowest scores. The findings underscored the need for improvement in mathematics instruction and the integration of communication skills, which are interconnected with mathematical learning [48].

Factors Contributing to Low Performance in NAT. The aforementioned results were attributed to external factors: 1. Family-related factors - family environment, family background, socio-economic status, parental support; 2. Technology-related factors - technology use, media exposure; 3. Student-related factors - poor study habits, IQ, emotional profile, learner language proficiency, diversity, interest in the subject, high school GPA in all subjects, especially in Mathematics and English; 4. Administrative-related factors - difficulty in decisionmaking, implementation of the K to 12 program, misalignment between the revised curriculum and the existing assessment framework, language mismatch between the test and the medium of instruction, large classes or class size, school type; 5. Instruction-related factors - outdated instructional designs, insufficient localization of materials, learning resources, student-book ratio; 6. Teacher-related factors - inadequate research-based teaching strategies, teaching load, teaching methodologies, teacher qualifications, years of teaching experience, the mismatch between qualifications and assigned subjects, teachers' training or seminars attended, teachers' performance in the classroom, remedial teaching, teacher's age, and varied teaching strategies. In conclusion, a range of factors-including language proficiency, socio-economic background, teacher qualifications, and instructional strategies-play crucial roles in influencing students' performance on the National Achievement Test. Addressing these factors, alongside a review of the alignment between the K to 12 curriculum and the assessment framework, could help improve student outcomes [37, 18, 4, 1, 7, 41, 6, 50, 48, 29, 28, 4, 55].

Some Recommendations for Improvement. 1. Curriculum and Instructional Improvements: Namoco *et al.* [39] and DepEd [18] recommended curriculum revisions, localized

instruction, and intensive teacher training to improve Mathematics and Science performance. Quilnet and Batucan [48] highlighted integrating 21st-century skills like problemsolving and critical thinking into the curriculum. 2. Strategic Planning and School Support: Bernales et al. [6] proposed a five-year strategic plan to enhance school facilities, address socio-economic barriers, and create better learning environments. Behiga [5] emphasized regular curriculum updates, teacher welfare, and improved school infrastructure to support student success. 3. Emotional and Cognitive Readiness: Cabiling-Ramos [7] stressed the importance of student's mental and emotional preparedness for assessments like the NAT, recommending interventions to improve emotional well-being and cognitive readiness. 4. Teacher Development and Monitoring: Guiaselon et al. [29] advocated for free, high-quality training, teacher specialization, adherence to class size limits, interactive teaching methods, and regular classroom observations with mentoring to enhance teaching standards. 5. Future Research: Casildo et al. [9] called for further studies using broader datasets and diverse machine learning algorithms to better understand factors affecting NAT performance [7, 29, 41].

Predicting Students' Performance in NAT through Academic Grades. 1. Machine Learning for NAT Prediction: Casildo et al. [9] developed a machine learningbased decision support system to predict senior high school students' NAT performance, emphasizing real-time data monitoring to adjust teaching strategies. Key predictors included subjects like Physical Science, Philosophy, English, and Filipino. The study revealed guarter-specific variations, such as Filipino grades in Quarter 2 significantly influencing NAT scores. 2. Academic Performance and NAT Correlation: A strong link was found between APSA scores, GPAs, IQ, and NAT performance in Science. GPA in English and APSA scores were key predictors, aligning with the Cattell-Horn-Carroll theory of cognitive ability's impact on academic achievement. 3. Insights from School Tests: Paredes et al. [43] highlighted a strong correlation between NAT scores and academic performance in Mathematics. Trends over four years showed variations in student achievement across key subject areas. 4. Test Scores and Academic Outcomes: Santillan [51] found significant correlations between NAT, OLSAT, and ABSAT scores, showing test scores as strong predictors of academic performance in Grade 6 students. 5. Enrollment Trends and Filipino Performance: Quajao [47] noted that higher enrollment correlated with stronger academic strategies but found no consistent link between Filipino proficiency and NAT results, highlighting the need for further investigation into factors influencing performance [9, 10, 14, 51, 47, 43].

**Municipality.** A municipality is a type of local government unit (LGU) in the Philippines, distinct from a city, which falls under a different category of local government. The country's provinces are divided into cities and municipalities, with municipalities further subdivided into barangays (formerly known as barrios), or villages. As of June 30, 2024, there are 1,493 municipalities in the Philippines. The term "municipality" is the official designation for what was historically called a town, and the two terms are used interchangeably, including in Filipino translations. A "municipal district" was a now-obsolete local government unit, originally designated for certain areas before being reclassified as municipalities. [57]

**Class of Municipality.** Philippine cities, municipalities, and provinces are classified by average annual income over three years:

- First Class: Provinces (≥₱450M), Cities (≥₱400M), Municipalities (≥₱55M)
- Second Class: Provinces (₱360M–₱450M), Cities (₱320M–₱400M), Municipalities (₱45M–₱55M)
- Third Class: Provinces (₱270M–₱360M), Cities (₱240M– ₱320M), Municipalities (₱35M–₱45M)
- Fourth Class: Provinces (₱180M–₱270M), Cities (₱160M– ₱240M), Municipalities (₱25M–₱35M)
- Fifth Class: Provinces (₱90M–₱180M), Cities (₱80M– ₱160M), Municipalities (₱15M–₱25M)
- Sixth Class: Below ₱90M for Provinces, ₱80M for Cities, and ₱25M for Municipalities [44].

Congressional District. The congressional districts of the Philippines are electoral districts or constituencies used to elect 253 of the 316 members of the House of Representatives, with the remaining 63 members chosen through party-list proportional representation. The country is divided into 253 congressional districts, also known as legislative or representative districts, each representing at least 250,000 people or an entire province. According to the 1987 Constitution, there were initially provisions for a maximum of 200 congressional districts, making up 80% of the 250 seats in the lower house, with the remaining 20% (50 seats) reserved for sectoral or party-list representatives. This number has been adjusted with the passage of various laws, including the 1991 Local Government Code, which allowed for the creation of additional districts. Philippine congressional districts are contiguous and compact, formed from neighboring local government units where possible. These are single-member districts, each electing one representative to serve a maximum of three consecutive three-year terms, using a first-past-the-post voting system. Currently, the House of Representatives has 235 singlemember congressional districts, electing 235 of the 316 members of the House [46].

Effect of National Achievement Test (NAT) to the Teacher and Pupils. The National Achievement Test (NAT) evaluates student learning and aligns it with educational goals, reflecting both student competencies and teacher effectiveness. However, its impact on students is limited, as failing does not hinder graduation, and high achievers receive little recognition. While the NAT aims to address learning gaps and strengthen areas of competence, concerns about its validity, reliability, and implementation have led to calls for its abolition. It has also been criticized for promoting "teaching to the test," which compromises holistic education. Despite these issues, the NAT benefits younger students by identifying developmental delays and guiding teachers to improve methods, encouraging efforts to enhance future performance [33].

**3. SIGNIFICANCE OF THE STUDY.** The study is significant in several ways, as it seeks to address critical educational challenges and opportunities for improvement in

the province's senior high schools. 1. For Teachers: By analyzing the National Achievement Test (NAT) results alongside the demographic profile of Grade 12 students, this study provides teachers with valuable insights into how various factors, such as socio-economic status, location, and access to resources, influence student performance. These insights can guide teachers in designing and implementing targeted interventions to improve academic outcomes. 2. For School Administrators: The findings of this study offer administrators a comprehensive understanding of the performance trends and demographic factors affecting their schools. This enables them to create evidence-based programs and policies tailored to the specific needs of their students, ensuring more equitable access to quality education. 3. For Policymakers: Policymakers can utilize the data from this study to inform decisions on resource allocation, curriculum development, and teacher training programs. Understanding the correlation between demographic factors and NAT performance allows policymakers to address systemic issues and implement solutions that promote educational equity and excellence across the province. 4. For Students and Parents: The study empowers students and parents by highlighting the factors that contribute to academic success. Awareness of these factors encourages greater collaboration between students, parents, and educators in fostering a supportive learning environment. 5. For Future **Researchers:** This study serves as a foundational resource for researchers exploring the intersection of academic performance, demographic factors, and educational interventions. It also paves the way for studies that incorporate technology and data analytics to predict and enhance student outcomes, aligning with modern advancements in educational data mining. Ultimately, the study contributes to the broader goal of improving education in Negros Oriental by identifying performance gaps and actionable strategies for addressing them. By linking demographic profiles with NAT results, it fosters a deeper understanding of the challenges and opportunities in the local educational landscape, thereby promoting a culture of continuous learning and development.

4. METHODOLOGY. 1. Research Design - This study employs a descriptive-correlational research design to investigate the factors influencing Grade 12 students' performance in the National Achievement Test (NAT) in Negros Oriental Province Division. The design is appropriate for analyzing and describing the current state of student performance while exploring relationships between key variables such as the size of examinees, school type, municipal classification, geographical location, and NAT scores.., first-class, second-class municipalities) and geographic factors. 2. Research Respondents - The study focuses on eight thousand sixty-two (8062) Grade 12 students and one hundred fourteen (114) Senior High Schools in Negros Oriental Province who participated in the National Achievement Test (NAT). 3. Research Environment - This study was conducted in Negros Oriental Province, a region in the Central Visayas of the Philippines. The research environment encompasses various schools, municipalities, and socio-economic settings that influence student performance on the National Achievement Test (NAT).

Negros Oriental was chosen due to its significant performance gaps in the NAT compared to the wider Central Visavas region. The province offers a unique setting to study the interplay between geographic, socio-economic, and institutional factors influencing student outcomes. The presence of varied school types and municipal classifications also provides a rich context for analyzing disparities in educational performance. 4. Research Instrument - The main research instrument for this study was the National Achievement Test (NAT) tool used by DepEd in the implementation of the NATG12. Official NAT results of Grade 12 students in Negros Oriental Province Division were provided by the division. This instrument allowed the researchers to systematically examine existing data to identify trends, correlations, and disparities. 5. Statistical Treatment of Data - The statistical treatment of data in this study was designed to analyze the performance of Grade 12 students in the National Achievement Test (NAT) across various factors such as size of examinees, type of school, municipality classification, and geographical location of the participating senior high schools. Descriptive statistics such as mean, median, mode and standard deviation were used to summarize the general performance of the examinees highlighting central tendencies and variability. Mann-Whitney U test was used to compare NAT performance between two independent groups. Kruskal Wallis H Test was used to compare NAT performance across three or more independent groups. The boxplot showed visual differences in cases of significant differences from the Kruskal-Wallis H Test. Chi-Square for Independence and Contingency Coefficient were used to assess the relationships between the NAT performance and the factors considered in this study. 6. Ethical Considerations - Permission was obtained from the Department of Education (DepEd) and local school administrators to conduct the study. The research environment was treated with respect, ensuring that no disruptions to regular school activities occurred during data collection.

#### 5. PRESENTATION OF DATA

**Legend:** MPS (Descriptive Equivalent) 90 - 100 (Highly Proficient; 75 - 89 (Proficient); 50 - 74 (Nearly Proficient); 25 - 49 (Low Proficient); 0 - 24 (Not Proficient) [17].





Figure 1 above revealed that the learning competencies assessed by the National Achievement Test (NAT), based on the three 21st-century skills, were particularly challenging for Grade 12 students in the Division of Negros Oriental

Province, as indicated by the low proficiency levels. While the results indicated that Grade 12 examinees were classified as low proficient in the 2023 National Achievement Test (NAT), they performed better in Philosophy regarding problem-solving and critical thinking skills, and second in information literacy skills. Conversely, Mathematics and Science emerged as the two most challenging subjects for students across all 21st Century Skills. It is notable that in Mathematics, the examinees performed better in Critical Thinking Skills, while in Science, the examinees performed better in Information Literacy Skills.

Namoco, S. et al. [39] and Quilnet and Batucan [48] reveal similar trends in student performance, emphasizing challenges in Mathematics and Science. Namoco, S. et al. [39] analyzed the SY 2017-2018 NAT results, finding Filipino and Araling Panlipunan as the strongest subjects, while Mathematics and Science consistently lagged, reflecting the patterns observed in Negros Oriental. These findings highlight the need for targeted interventions to improve critical thinking and information literacy in these subjects. Similarly, Quilnet and Batucan [48] evaluated the Basic Education Exit Assessment (BEEA), noting general deficiencies in 21st-century skills such as problem-solving and critical thinking, particularly in Mathematics. These studies underscore the urgent need for curriculum improvements to address proficiency gaps and foster essential skills across all subjects. [39, 48]





As shown in Figure 2 above, most of the participating students come from schools with a large student population, while many of the participating schools have fewer examinees. Examinees from larger participating schools outperformed those from small and medium-sized institutions. However, despite this performance gap, no significant differences in proficiency levels were found when students were categorized by school size. While proficiency levels among examinees from participating senior high schools did not show significant variation based on the size of their student bodies, a notable relationship was identified between school size and proficiency levels. Students from larger schools tend to achieve better results in future National Achievement Tests.

Antoniou *et al.* [3] highlight that larger school and class sizes can lead to greater unpredictability and lower school readiness, with benefits diminishing beyond a certain point. While larger schools may provide more resources, extracurricular options, and specialized instruction, they also incur hidden costs, such as higher transportation expenses and potential negative impacts on student outcomes. The study found that students in larger schools generally perform better on standardized tests like the NAT, despite no significant variation in overall proficiency levels among senior high school students based on school size. However, the relationship between school size and achievement is complex, influenced by factors such as resources, teaching quality, and school culture. Balancing school size is critical to optimizing student outcomes. [3, 31, 30, 61, 52]

Dar and Go [13] and Namoco et al. [38] highlight the significant role of school size in student performance, particularly in standardized tests like the NAT. Dar and Go [13] found that larger schools, benefiting from established systems and resources, were associated with better performance in English and overall NAT scores, with a high correlation (r = 0.853) between English proficiency and NAT results. Similarly, Namoco et al. Others [38] observed that larger schools outperformed smaller ones, particularly in resource-rich divisions like Cagavan de Oro City, due to better support and opportunities. However, both studies noted no significant differences in overall proficiency levels when strictly categorized by school size, suggesting that other factors, such as teaching quality and community support, also influence outcomes. These findings underscore the importance of school size and contextual factors in shaping student performance while highlighting the need for targeted interventions for smaller, resource-limited schools. [13, 38]



Figure 3: Difference of NATG12 Ratings when Grouped According to the Type of School of the Participating Senior High Schools

Figure 3 reflects that the bulk of these students attend regular senior high schools, which represent most of the participating institutions. As expected, students from Public Science High School outperformed their peers from Public Comprehensive and Private High Schools. A significant difference in proficiency levels is evident when examinees are categorized Sci-Int.(Lahore),36(6),677-688,2024

by school type, as illustrated in the boxplot above. Students from Public Science High School achieved superior results compared to those from Public Comprehensive and Private High Schools. There is a significant relationship between school type and examinee proficiency levels, with students from Public Science High Schools generally performing better on the National Achievement Test.

Studies by Magulod [36] and others demonstrate that school type significantly influences student performance, particularly in the National Achievement Test (NAT). Magulod [36] found that public schools consistently outperformed private schools over three years, driven by stronger home-school relationships, parental involvement, and academic achievement. Public Science High Schools excelled compared to Public Comprehensive and Private High Schools, emphasizing the importance of school leadership, instructional practices, and professional collaboration. Public schools' safe environments and focus on parental engagement contribute to their success, while effective management practices further bolster performance. Additional research highlights that alternative school types, with unique teaching approaches, also positively impact academic outcomes, reinforcing the role of school type in shaping student achievement. Overall, the findings suggest that Public Science High Schools achieve superior results in standardized tests like the NAT due to their specialized focus and resources. [36, 8, 28]



Figure 4: NATG12 Ratings when Grouped According to the **Municipality of the Participating Senior High Schools** 

A significant number of students, shown in Figure 4 above, are from Siaton, followed by Mabinay and Santa Catalina. Correspondingly, most of the participating schools are situated in Siaton, with Mabinay and Santa Catalina also represented.



Figure 5: Difference of NATG12 Ratings when Grouped According to the Class of Municipality of the Participating Senior High Schools

Figure 5 gives additional information concerning the class of municipality. Many of the participating students hail from first-class municipalities, where most of the schools are also located. Students from Negros Oriental High School, the sole high school in Dumaguete City under the Negros Oriental Province Division, outperformed all other examinees from participating schools. They were closely followed by students from the municipalities of Manjuyod and Dauin. Consistent with earlier findings, examinees from Negros Oriental High School achieved superior results. Additionally, students from municipalities classified as Second Class and Fourth Class outperformed those from other municipal categories. A notable difference in proficiency levels is evident when examinees are categorized by Class of Municipality, as shown in the boxplot below. The performance of examinees from the participating senior high schools in Second Class municipalities differs from those in other classes. There is a significant relationship between the Class of Municipality and the NAT proficiency levels of examinees, suggesting that government support, indicated by the Class of Municipality, may enhance students' performance on the National Achievement Test.



Figure 6: Difference of NATG12 Ratings when Grouped According to the Congressional District of the Participating Senior High Schools

Figure 6 revealed that the majority of students are from the Third Congressional District, which is home to most of the participating schools. Even though Negros Oriental High School belongs to the Second Congressional District, Congressional examinees from the First District outperformed those from other districts. While students from the participating senior high schools in the First Congressional District achieved better results than their peers in other districts, there was no significant difference in proficiency levels when grouped by Congressional District. Consistent with previous findings, no significant relationship

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exists between Congressional District and NAT proficiency levels. The Congressional District in which the participating schools are located does not appear to impact students' performance on the National Achievement Test.

Effective budget allocation significantly impacts student achievement on standardized tests like the National Achievement Test (NAT). Gain and Ancho [26] demonstrate that targeted spending on instructional resources-such as teacher training, learning materials, and facilities-improves student performance, particularly in Mathematics and Filipino. Schools in wealthier municipalities, like Dumaguete City, consistently outperform others due to better funding and resource allocation, while even resource-limited municipalities can achieve positive outcomes through strategic spending. Key findings reveal that schools allocating 45% or more of their budgets to instructional expenses see substantial gains in NAT scores. This underscores the importance of prioritizing teacher development and While educational municipal materials. financial classification significantly influences student outcomes, the study emphasizes that how funds are spent, rather than the total amount, is critical. In contrast, Congressional District classifications showed no significant impact, highlighting the stronger role of local government support. In conclusion, strategic budget utilization, particularly in instructional areas, is essential for improving academic performance, as supported by both Gain and Ancho's findings and municipallevel analyses. [26].

Many local government units (LGUs) do not initiate literacy projects due to practical constraints and perceived responsibilities. Some LGUs view literacy programs as DepEd's responsibility, while others face financial limitations or lack proposals and resolutions addressing literacy needs. Additionally, literacy projects are often not prioritized or suffer from a lack of awareness and continuity from past administrations. To address these challenges, proposed solutions include requiring LGUs to allocate a portion of their Internal Revenue Allotment (IRA) for literacy programs and incorporating these initiatives into annual development plans. The DILG could implement policies encouraging LGUs to focus on literacy, particularly in areas with low functional literacy rates, and ensure community involvement in program planning and execution. While education in the Philippines is largely controlled by the national government, LGUs play a role in maintaining infrastructure and funding through the Special Education Fund (SEF). However, funding disparities persist, with urban schools often receiving more support than rural ones, leading to performance gaps. Evidence suggests that better-funded schools, particularly in first-class municipalities, consistently achieve higher student outcomes, such as improved NAT scores. In conclusion, addressing barriers like funding limitations and prioritization issues, alongside targeted policy interventions, can strengthen LGUled literacy initiatives and improve educational outcomes across regions [16, 45, 25, 21].





Figure 7 shows that many students attend schools very close to the Municipal Hall, with only a few schools located farther away. Examinees from participating schools situated in the Town Proper (near the Municipal Hall) tend to perform better. Previous findings indicate a significant difference in National Achievement Test proficiency levels when students are categorized by their distance from the Municipal Hall. As shown in the boxplot above, students from schools located in the town proper or very close to the Municipal Hall outperformed those from schools further away. There is a significant relationship between distance from the Municipal Hall and NAT proficiency levels, suggesting that students from participating schools in the town proper or nearby are likely to achieve better results on the National Achievement Test.



Figure 8: Difference of NATG12 Ratings when Grouped According to the Distance from the National Highway of the Participating Senior High Schools

As shown in Figure 8, most students reside near or along the national highway, whereas many participating schools are situated farther from it. Examinees from participating schools situated along or near the National Highway achieved better results. Consistent with previous findings, there is a

significant difference in NAT proficiency levels when students are grouped by their distance from the National Highway. The boxplot above illustrates that students from schools close to the National Highway outperformed those from schools located further away. There is a significant relationship between distance from the National Highway and NAT proficiency levels, indicating that students from schools along or near the highway are likely to achieve better results on the National Achievement Test.

Studies consistently show that a school's geographical location, particularly its proximity to key infrastructures like the Municipal Hall and National Highway, significantly impacts students' academic performance on tests such as the National Achievement Test (NAT). Urban schools or those in town centres benefit from better access to facilities like electricity, healthcare, and educational resources, fostering improved learning environments. Students in schools near central locations, such as Municipal Halls or highways, often outperform peers from rural or remote areas due to better infrastructure, transportation, and community resources. While rural schools sometimes excel despite limited amenities, urban schools typically offer broader educational tools and services, boosting academic outcomes. Proximity to highways ensures easier access to schools and reduces travel time, enhancing students' learning opportunities. Spatial inequalities, as highlighted by Quindoza [49], reveal that schools in urban or affluent areas enjoy better funding and resources, leading to higher test scores. Addressing these disparities requires targeted policies to support remote schools and ensure equitable access to resources for improved academic performance. [23,60, 59, 2, 11, 53, 49, 34, 42, 22, 12, 32].



Figure 9: Correlational Framework of the Profile of the Senior High Schools in the Negros Oriental Province Division and their Grade 12 Student' NAT Performance

The diagram shown in Figure 9 above illustrates the correlational framework of the school-related factors examined in this study, which are associated with the performance of Grade 12 students in the National Achievement Test.

The Philippine Institute for Development Studies (PIDS) pointed out that failure to let the public know about the NAT

results had contributed to the ongoing education crisis. Philippine Institute for Development Studies (PIDS) pointed out that failure to let the public know about the NAT results had contributed to the ongoing education crisis. "Even though we continuously administer national achievement tests, the results are never granularly available for in-depth analysis and even less public discussion," said the report authored by PIDS president Aniceto Orbeta Jr. and research fellow Vicente Paqueo [5]. It is from this notion that this study gets its inspiration. May the correlational framework above give a clearer picture of the other factors that affect the student's performance in the National Achievement Test (NAT).

# 6. CONCLUSION

The results of the 2023 National Achievement Test (NAT) indicate that Grade 12 students in the Division of Negros Oriental Province faced significant challenges in mastering the competencies associated with the three 21st-century skills. The overall low proficiency levels highlight the need for targeted interventions, particularly in Mathematics and Science, which emerged as the most difficult subjects for students. While examinees from Public Science High Schools excelled compared to their peers in Public Comprehensive and Private High Schools, the influence of school size and municipality class on student performance was evident. Despite larger schools generally yielding better results, the lack of significant differences in proficiency levels based on school size suggests that other factors, such as teaching quality and resources, may play a critical role. The geographical location of schools also contributed to performance outcomes; students from schools near the Municipal Hall and the National Highway performed significantly better, underscoring the importance of access to educational resources and support. Overall, this study underscores the complexity of educational performance, highlighting how factors such as school type, municipality class, and geographic location intertwine to influence student outcomes. Future efforts should focus on enhancing support for schools facing challenges, particularly in underperforming subjects, while leveraging the strengths of well-performing institutions to foster improvement across the division. By addressing these areas, stakeholders can work toward elevating the overall educational standards and proficiency levels of students in Negros Oriental.

### 7. RECOMMENDATION

To address the challenges faced by Grade 12 students in the Division of Negros Oriental Province as indicated by the low proficiency levels in the National Achievement Test (NAT), the following recommendations are proposed:

- *Targeted Curriculum Enhancement:* Focus on improving instruction in Mathematics and Science, the subjects identified as most challenging. Professional development for teachers in these areas could enhance teaching strategies and student engagement. Emphasize quality over quantity in K-12 Implementation. Target interventions for learning recovery that align with the urgent need to address functional literacy and numeracy deficiencies.
- *Strengthening* 21st-Century Skills: Integrate more problem-solving, critical thinking, and information literacy

exercises into the curriculum. Workshops and training sessions for educators can equip them to foster these skills effectively in their classrooms. Suspend regular schedules for focused learning recovery which will provide struggling learners the time and resources necessary to close proficiency gaps. Comprehensive assessments before and after the programs can further refine intervention strategies, ensuring maximum effectiveness.

- *Support for Smaller Schools:* Provide additional resources and support for smaller and medium-sized schools to enhance their instructional capabilities. This could include tutoring programs, access to learning materials, and collaborative projects with larger schools.
- *Leverage Public Science High Schools:* Utilize the successful strategies employed by Public Science High Schools to develop best practices that can be shared with other school types. Establish mentorship programs where these schools can guide less successful institutions.
- Community and Government Support: Advocate for increased government support tailored to the needs of different municipalities, particularly those classified as Second Class and Fourth Class. Community engagement initiatives can also bolster local support for educational programs. Localize education service delivery by emphasizing the importance of decentralizing and fostering local government involvement, addressing community-specific needs, such as resource allocation and school development projects, as well as informal interactions between local officials and citizens.
- *Geographic Accessibility Initiatives:* Explore ways to enhance accessibility to schools located further from the Municipal Hall and the National Highway. Consider transportation solutions or satellite programs that can bring quality education to underserved areas. Implementing community-based alternative delivery modes (ADM) can address accessibility challenges, coupled with strengthened collaborations with local officials, which can reduce distance-related absenteeism.
- **Ongoing Assessment and Feedback:** Implement a system of continuous assessment to monitor student progress and adapt teaching methods as necessary. Regular feedback from students and educators can inform adjustments to teaching strategies and resource allocation.
- Parental and Community Involvement: Encourage greater involvement of parents and community members in the educational process. Workshops and information sessions can help stakeholders understand how they can support student learning. Do environmental campaigns for schools that can improve the overall school environment and encourage attendance and engagement of students.
- Utilizing Machine Learning for Real-Time Performance Evaluation: Revolutionize assessment methods by integration of machine learning in educational data mining.Algorithms could identify trends in student performance by profile or factor allowing for data-driven strategies to improve NAT proficiency.
- *Improving Infrastructure and Utilities* The provision of basic utilities and infrastructure like transportation, sanitation facilities, and electricity and prioritizing infrastructure improvements for schools in rural and

underserved areas can narrow the geographic and socioeconomic disparities in academic performance.

• Stakeholder Collaboration for Education Reform -Addressing the complexities of educational performance requires a multi-stakeholder approach. By focusing on these areas, stakeholders can work collaboratively to improve educational outcomes, enhance proficiency levels, and ensure that students in the Division of Negros Oriental Province are better prepared for future academic and career challenges. Partnerships between government agencies, local governments, industry partners, and communities are critical to implementing reforms. These collaborations can ensure equitable resource distribution and support systems for schools in geographically disadvantaged areas. [9, 19, 35 27, 23, 20, 49].

In addition, since the researcher is a Faculty member of the College of Teacher Education at Negros Oriental State University, she planned to pursue an ICT-Based Video Package Extension Project/Program that will address the findings of this study. This Extension Project/Program shall be a joint activity of all the Faculty members of the College of Teacher Education in different majors of specializations considered in the National Achievement Test (NAT).

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