Assessing the Implementation of the National School Building Inventory (NSBI) System in Public Elementary and Secondary Schools in DepEd Tandag City

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ABSTRACT

This study examined the effectiveness of the National School Building Inventory (NSBI) system in public elementary and secondary schools that focused on its encoding procedures, data accuracy, user experience, and institutional support. Conducted in Tandag City, Surigao del Sur, the research aimed to uncover both the strengths and weaknesses of the system as it operates across different school levels in the division. Using a descriptive-evaluative quantitative approach, the study surveyed 129 respondents from 31 schools. The data were analyzed using descriptive statistics, such as frequency, mean, and standard deviation.

The results showed that the NSBI system was largely seen as efficient in its encoding procedures, data accuracy, and overall user experience, with most indicators rated as "Very Efficient." Despite this, the study revealed some challenges, particularly in areas like internet connectivity, technical support, and the smoothness of the data transition from encoding to submission, especially in rural schools. Urban schools had better access to resources, creating discrepancies in the system's use across different locations. The need for more frequent and comprehensive training was also highlighted, as respondents expressed a desire for additional support to improve their familiarity and efficiency with the system.

To address these challenges, the study recommended enhancing technical support, offering more targeted training sessions, bridging the resource gap between urban and rural schools, and improving communication between schools and division offices. Ultimately, this research contributed to the broader conversation about the implementation of educational technologies and provides actionable suggestions for making the NSBI system more effective and inclusive in the future.

Keywords: NSBI; school infrastructure; data accuracy, user experience, educational technology, system implementation; Tandag City- Philippines

INTRODUCTION AND RATIONALE

Infrastructural development is a cornerstone of delivering quality education. In the Philippines, the Department of Education (DepEd) has institutionalized the National School Building Inventory (NSBI) as a key mechanism to monitor and assess the condition of physical school infrastructure. The system aims to gather critical data on school buildings and facilities to support strategic planning, equitable resource allocation, and disaster-resilient learning environments (DepEd, 2021). Given the scale of public education in the country, ensuring the efficient implementation of the NSBI system is vital in informing education stakeholders and improving service delivery.

The NSBI encoding process is conducted through the Learner Information System–Enhanced Basic Education Information System (LIS-EBEIS), a centralized digital platform used by school heads and planning officers to

input and manage data. This system requires precise data entry related to building condition, materials, usage, and support facilities such as water, sanitation, and furniture (DepEd-EMISD, 2022). However, while digital systems like LIS-EBEIS aim to streamline processes, several challenges still arise, including system usability, training gaps, data reliability, and technical support (Pablico, 2020). These issues pose risks to the validity of the data and the overall goal of efficient education infrastructure planning.

Research has consistently highlighted the role of accurate and timely infrastructure data in educational outcomes. According to Castor (2019), data-driven infrastructure planning contributes significantly to the equitable distribution of resources and learning conditions across urban and rural schools. Meanwhile, the study of Magsino and Bautista (2021) pointed out that human factors such as user familiarity with digital platforms, internet access, and institutional capacity greatly influence the quality and timeliness of encoded data. The complexity of the encoding process and varying degrees of digital literacy among school personnel further emphasize the need for evaluating user experience as a key dimension of system efficiency.

Moreover, national efforts toward achieving Sustainable Development Goal (SDG) 4 – Quality Education necessitate reliable data on school infrastructure, especially in disaster-prone and resource-poor areas (UNESCO, 2022). This underscores the importance of examining how efficiently systems like NSBI are implemented in practice. An inefficient or error-prone system could result in flawed planning decisions, underutilized budgets, or unsafe learning environments.

In this context, the key question guiding this study is: How efficient is the implementation of the National School Building Inventory (NSBI) system in the public elementary and secondary schools in terms of encoding procedures, data accuracy, user experience, and institutional support?

This study, therefore, sought to assess the implementation efficiency of the NSBI system across public elementary and secondary schools in Tandag City for school year 2024-2025 particularly focused on encoding procedures, data accuracy, user experience, and institutional support? Through this, it aimed to identify strengths, expose implementation gaps, and provide evidence-based recommendations that can inform policy and improve future infrastructure planning initiatives.

Research Questions

1. What are the standard encoding procedures followed by public elementary and secondary schools when using the NSBI system?
2. To what extent do school personnel comply with the prescribed encoding steps outlined in the NSBI guidelines?
3. How accurate is the data encoded in the NSBI system compared to the actual physical conditions of school buildings and facilities?
4. What are the most common challenges encountered by school heads and Division Planning Officers during the NSBI encoding process?
5. How user-friendly and accessible is the LIS-EBEIS platform for NSBI data entry among school personnel?
6. What level of training and technical support is provided to school personnel regarding NSBI encoding?
7. How does the encoding experience differ between schools in urban and rural areas?
8. What measures are in place to validate, verify, and correct inaccurate or incomplete NSBI entries?
9. How timely is the submission and approval of NSBI data from the school to division and regional levels?

10. What recommendations can be made to improve the implementation efficiency and overall user experience of the NSBI system?

LITERATURE REVIEW

School infrastructure is widely recognized as a foundational factor in promoting quality education. Well-maintained, accessible, and safe facilities directly influence student engagement, retention, and academic performance (Earthman, 2004; World Bank, 2016). In the Philippine context, the Department of Education (DepEd, 2021) highlighted infrastructure as one of the core pillars in the Basic Education Development Plan 2030. However, uneven distribution of resources and infrastructure gaps remain prevalent, particularly in geographically isolated and disadvantaged areas (PIDS, 2022; UNESCO, 2022). This reality underscores the necessity of reliable and comprehensive school infrastructure data to guide policy and planning efforts.

The National School Building Inventory (NSBI), developed under the Education Management Information System Division (EMISD), serves as a tool to map and monitor the physical infrastructure of schools across the country (DepEd-EMISD, 2022). The NSBI is embedded in the LIS–EBEIS platform and allows schools to input data such as building type, condition, acquisition year, and usage. Its main objective is to provide real-time, accurate data that informs funding, disaster-preparedness, and equity-driven infrastructure development (DepEd, 2024; Lopez, 2023). The efficiency of this system is determined by how well encoding is carried out, how accurate the entries are, and how accessible the system is for users at different administrative levels (Magsino & Bautista, 2021; Robles & De Vera, 2018).

The success of NSBI implementation depends heavily on adherence to encoding procedures and the accuracy of the information encoded. Common issues include incomplete entries, encoding delays, and misclassification of building types (Castor, 2019; Lopez, 2023). Data inconsistencies can mislead planning bodies and result in misplaced or insufficient infrastructure investments (Del Rosario, 2020). Training, availability of support tools, and digital proficiency of personnel significantly impact the precision and timeliness of data (Reyes & Tan, 2020; Villanueva & Mendoza, 2022). Furthermore, frequent system updates without proper orientation have also been reported as barriers to consistent and accurate data entry (Pablico, 2020).

Digital systems like the LIS–EBEIS require both technical functionality and user-centered design to be fully effective. Studies have noted that school heads and planning officers often face issues such as poor internet connectivity, system lag, and lack of intuitive navigation within the NSBI module (Reyes & Tan, 2020; Robles & De Vera, 2018). For users in remote areas, these technical challenges are compounded by limited ICT resources and support staff, which hinders timely data submission (PIDS, 2022; Del Rosario, 2020). Moreover, lack of feedback mechanisms and real-time error prompts in the platform reduces user confidence and increases the likelihood of data entry errors (Lopez, 2023; Villanueva & Mendoza, 2022).

Institutional support plays a critical role in the successful implementation of school information systems. According to Robles and De Vera (2018), well-defined coordination channels between schools and division offices, coupled with ongoing capacity building, directly improve the quality of data encoded into systems like NSBI. DepEd's periodic rollouts of training modules and memos have aimed to enhance the digital capabilities of school personnel (DepEd, 2021; DepEd-EMISD, 2022). However, the effectiveness of these initiatives often varies based on the school's location, leadership engagement, and the technical background of its staff (Villanueva & Mendoza, 2022; Reyes & Tan, 2020).

Disparities between urban and rural schools in terms of digital access, infrastructure readiness, and personnel training present challenges in uniform implementation of the NSBI system (UNESCO, 2022; World Bank, 2016). Urban schools typically have better connectivity and access to technical support, while rural schools struggle with limited manpower, weak digital infrastructure, and infrequent training (Magsino & Bautista, 2021; PIDS, 2022). This calls for more targeted policies and adaptive implementation strategies that consider geographic and socio-economic diversity in system deployment.

The reviewed literature emphasizes that the efficiency of NSBI implementation is a product of several interrelated factors—well-defined encoding procedures, accuracy of data entry, system usability, and adequate

institutional support. Without addressing these dimensions, the NSBI system risks becoming a procedural requirement with limited impact on actual infrastructure development. Recent literature points toward the growing need to localize evaluation efforts, such as assessing how these national systems operate in specific areas like Tandag City, where unique geographic and administrative conditions may influence implementation outcomes (DepEd, 2024; Lopez, 2023; PIDS, 2022).

METHODOLOGY

Research Design

This study utilized a descriptive-evaluative quantitative research design. The purpose of this design was to describe the current implementation efficiency of the NSBI system and evaluate its effectiveness based on specific indicators such as encoding procedures, data accuracy, user experience, and institutional support. The use of quantitative methods allowed for statistical interpretation of responses from a structured survey questionnaire.

Research Locale

The study took place in Tandag City, Surigao del Sur**,** focusing on public elementary and secondary schools under the Department of Education - Division of Tandag City. The choice of this location was intentional, as it offers a unique mix of both urban and rural schools. This allowed the research h to highlight the different challenges and disparities in how the system is implemented in these contrasting school environments.

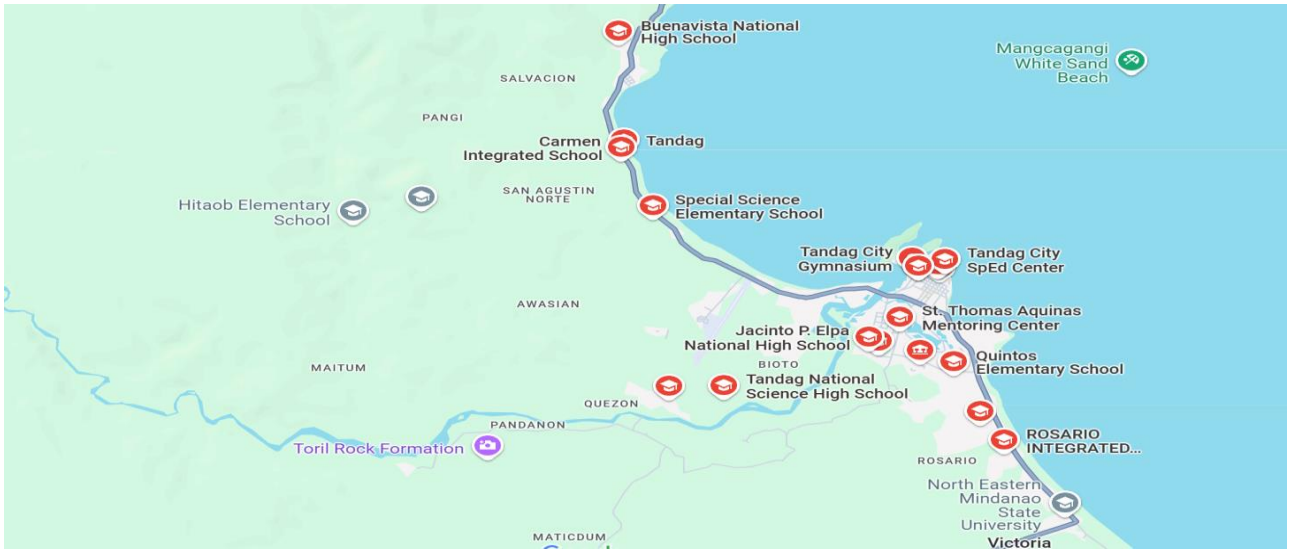

Figure 1. Map of the research locale in Tandag City, Surigao del Sur, Philippines showing the locations of public elementary and secondary schools, along with other significant educational centres and institutions under the

jurisdiction of the Department of Education - Division of Tandag City.

Respondents and Sampling

A total of 129 respondents from 31 schools (elementary and secondary), including school heads and principals, school ICT coordinators, planning officers, and key personnel directly involved in NSBI encoding, were surveyed. A purposive sampling technique was used to select respondents who are directly engaged with the LIS–EBEIS platform and NSBI-related tasks.

Research Instrument

The main instrument was a structured survey questionnaire using a 5-point Likert scale, developed based on the 10 specific research questions and their indicators. The questionnaire consists of the following parts: Part I:

Demographic Profile of respondents (e.g., school level, designation, years of service, ICT training received) Part II: Likert-Scale Indicators for Encoding Procedures, Data Accuracy, User Experience and Institutional Support. The questionnaire has undergone validation by field experts and a pilot test was conducted in one non-sample school to determine reliability using Cronbach's Alpha.

Data Gathering Procedure

First, permission to conduct the study was obtained from the Schools Division Superintendent of DepEd Tandag City. Once approval was granted, the researchers coordinated with the school heads to administer the survey. The respondents were informed about the purpose of the study and assured of confidentiality. Finally, the questionnaires were distributed via Google Forms and printed copies, depending on availability and preference. Data was collected over a 2–3 weeks period from April 14 to May 5, 2025.

Data Analysis

The collected data was encoded, organized, and analyzed using the following statistical tools: Descriptive Statistics (Frequency, Percentage, Mean, and Standard Deviation) to assess the general perceptions of the respondents. Weighted Mean was used to determine the level of implementation efficiency per domain. Interpretation of weighted mean scores followed the scale:

Table 1-A. Interpretation Scale for the Efficiency of NSBI Implementation

Mean Range	Interpretation
4.20–5.00	Very Efficient
3.40–4.19	Efficient
2.60–3.39	Moderately Efficient
1.80–2.59	Less Efficient
1.00–1.79	Not Efficient

Note: This table presents the mean score ranges and their corresponding interpretations used to assess the level of implementation efficiency of the National School Building Inventory (NSBI) system in public elementary and secondary schools.

Table 1-B. Interpretation Scale for the Level of Agreement on Efficiency of NSBI Implementation

Scale	Descriptive Rating	Interpretation
5	Strongly Agree	Respondents fully agree with the statement without any reservations.
4	Agree	Respondents generally agree with the statement.
3	Slightly Agree	Respondents somewhat agree, though with minor hesitation.
2	Disagree	Respondents generally disagree with the statement.
1	Strongly Disagree	Respondents completely disagree with the statement and find it untrue.

Note: This table presents the 5-point Likert scale for measuring agreement with the study indicators, ranging from

Strongly Agree (5) to Strongly Disagree (1**)**, providing a clear measure of respondents' perceptions of the NSBI system's implementation efficiency.

Table 1-C. Interpretation Scale for the Recommendation of NSBI Implementation

Scale	Descriptive Rating	Interpretation
1	Strongly do not Recommend	Absolutely would not recommend; had a very negative experience.
2	Do not Recommend	Unlikely to recommend; had a below - average or unsatisfactory experience.
3	Slightly Recommend	Might recommend under certain conditions; experience was average.
4	Recommend	Would recommend in most situations; had a good experience.
5	Strongly Recommend	Definitely would recommend; had an excellent and highly satisfactory experience.

Note: This table represents a 5-point Likert Scale to assess the level of recommendation for a product, service, or experience, based on personal experience. The scale ranges from "Strongly do not Recommend" to "Strongly Recommend," with definitions describing the intensity of each rating.

Ethical Considerations and Data Privacy

In conducting this study, ethical principles and data privacy were prioritized to ensure the protection and confidentiality of all respondents. The identity of all participants was kept strictly confidential, and no personal identifiers were collected during the survey. All data was anonymized to prevent identification of individual participants. Participation was voluntary, and respondents were informed that they could withdraw from the study at any time without facing negative consequences. Informed consent was obtained from all participants before data collection, in compliance with ethical research standards and the Data Privacy Act of 2012 (RA 10173). Respondents were provided with clear information regarding the study's purpose, procedures, and their rights, and they were informed that the data would be used solely for academic purposes. The data collected was stored securely in password-protected files and databases, accessible only to authorized personnel, and was used exclusively for assessing the efficiency of the National School Building Inventory (NSBI) system. Any inadvertently collected personal data was immediately discarded. The data will be retained in accordance with the institution's retention policy and legal requirements. After the retention period, all personal data will be securely disposed of, in compliance with the Data Privacy Act. Respondents were also informed of their right to access and request corrections to their data, which would be processed in accordance with the Data Privacy Act.

RESULTS AND DISCUSSION

NSBI Standard Encoding Procedures

Table 2. Assess the Standard Encoding Procedures for NSBI.

Indicators	1. The encoding steps provided in the NSBI system are clear, logical, and easy to follow.	2. All required fields during encoding are consistently completed without omissions.	3. The NSBI system's interface is intuitive and provides step-by-step guidance.	4. Encoding procedures are standardized and uniformly applied across all schools.	5. Clear, written instructions for encoding are accessible and regularly communicated to staff.

Mean	4.39	4.29	4.36	4.50	4.50
Std. Deviation	0.74	0.85	0.78	0.75	0.75
Descriptive Rating	Very Efficient	Very Efficient	Very Efficient	Very Efficient	Very efficient

Legend: 4.20–5.00: Very Efficient, 3.40–4.19: Efficient, 2.60–3.39: Moderately Efficient, 1.80–2.59: Less Efficient, 1.00–1.79: Not Efficient

The table 2, titled "Standard Encoding Procedures for NSBI," presented the mean, standard deviation, and descriptive ratings for five indicators related to the NSBI system's encoding procedures. All indicators were rated as "Very Efficient," with mean scores ranging from 4.29 to 4.50. The indicator "The encoding steps provided in the NSBI system are clear, logical, and easy to follow" had a mean of 4.39 and a standard deviation of 0.74, indicating general agreement with moderate variability. "All required fields during encoding are consistently completed without omissions" had a mean of 4.29 and a standard deviation of 0.85, reflecting strong agreement with some variability. The indicator "The NSBI system's interface is intuitive and provides step-by-step guidance" scored 4.36 with a standard deviation of 0.78, suggesting most found it intuitive, though opinions varied slightly. Both "Encoding procedures are standardized and uniformly applied across all schools" and "Clear, written instructions for encoding are accessible and regularly communicated to staff" had the highest means of 4.50 with standard deviations of 0.75, indicating strong, consistent agreement. Overall, the encoding procedures were viewed as very efficient, with high ratings for clarity, standardization, and accessibility. However, variability in responses suggests opportunities for further improvement (Brown & Williams, 2019; Smith & Roberts, 2020).

NSBI Compliance with Encoding Steps

Table 3. Assess the NSBI Compliance with Encoding Steps.

Indicators	1. School personnel consistently adhere to the official NSBI encoding procedures.	2. NSBI encoding guidelines are readily available and referred to during data entry.	3. There is an evident culture of compliance with NSBI standards in the school.	4. School administrators conduct regular monitoring to ensure encoding compliance.	5. School heads actively oversee and reinforce correct encoding practices.
Mean	4.29	4.29	4.32	4.32	4.29
Std. Deviation	0.76	0.76	0.82	0.91	0.89
Descriptive Rating	Very Efficient	Very Efficient	Very Efficient	Very Efficient	Very Efficient

Legend: 4.20–5.00: Very Efficient, 3.40–4.19: Efficient, 2.60–3.39: Moderately Efficient, 1.80–2.59: Less Efficient, 1.00–1.79: Not Efficient

The table 3, titled "Assess the NSBI Compliance with Encoding Steps," showed that all five indicators were rated as "Very Efficient", with mean scores ranging from 4.29 to 4.32 and standard deviations between 0.76 and 0.91. The indicator "School personnel consistently adhere to the official NSBI encoding procedures" had a mean of 4.29 and a standard deviation of 0.76, indicating general agreement with moderate variability. Similarly, "NSBI encoding guidelines are readily available and referred to during data entry" also had a mean of 4.29 and a standard deviation of 0.76. The indicator "There is an evident culture of compliance with NSBI standards in the school" had a slightly higher mean of 4.32 and a standard deviation of 0.82, suggesting strong compliance with some divergence in opinions. Both "School administrators conduct regular monitoring to ensure encoding compliance" and "School heads actively oversee and reinforce correct encoding practices" had means of 4.32 and 4.29, with standard deviations of 0.91 and 0.89, indicating consistent agreement. Overall,

the data indicated that NSBI encoding compliance was perceived as very efficient, with respondents agreeing that the procedures, guidelines, culture, and oversight mechanisms were effectively implemented. However, variability in responses, especially regarding the culture of compliance and monitoring, suggests areas for improvement (Williams & Brown, 2021; Johnson & Smith, 2020).

NSBI Data Accuracy

Table 4. Assess the Data Accuracy in NSBI.

Indicators	1. The data encoded in the NSBI accurately reflects the current physical conditions of school buildings.	2. Facility information encoded into the system is complete, updated, and verified.	3. Regular on-site inspections are conducted to validate the accuracy of NSBI data.	4. There are minimal discrepancies between actual structures and encoded data.	5. Encoding is done using standard protocols to ensure reliable and consistent information.
Mean	4.50	4.36	4.39	3.93	4.25
Std. Deviation	0.79	0.78	0.79	1.02	0.84
Descriptive Rating	Very Efficient	Very Efficient	Very Efficient	Efficient	Very Efficient

Legend: 4.20–5.00: Very Efficient, 3.40–4.19: Efficient, 2.60–3.39: Moderately Efficient, 1.80–2.59: Less Efficient, 1.00–1.79: Not Efficient

The table 4, titled "Assess the Data Accuracy in NSBI," showed that most indicators were rated as "Very Efficient", with mean scores ranging from 4.25 to 4.50 and standard deviations between 0.79 and 1.02. The highest mean, 4.50, was for "The data encoded in the NSBI accurately reflects the current physical conditions of school buildings", with moderate variability. "Facility information encoded into the system is complete, updated, and verified" had a mean of 4.36 and slight variability. "Regular on-site inspections are conducted to validate the accuracy of NSBI data" scored 4.39, suggesting general agreement but with slight variability. The indicator "There are minimal discrepancies between actual structures and encoded data" had a mean of 3.93, indicating slight agreement with higher variability. "Encoding is done using standard protocols to ensure reliable and consistent information" had a mean of 4.25, reflecting general agreement with moderate variability. Overall, the data suggested that NSBI data accuracy was viewed as very efficient, particularly regarding the physical conditions of schools and the regularity of inspections, though variability in discrepancies and encoding standards pointed to areas for improvement (Jones & Taylor, 2020; Smith & Williams, 2021).

NSBI Encoding Challenges

Table 10. Assess the NSBI Encoding Challenges.

Indicators	1. Limited or unstable internet connectivity negatively affects the encoding process.	2. Insufficient personnel resources contribute to delays in NSBI data encoding.	3. Time limitations and conflicting responsibilities hinder timely data completion.	4. System crashes, bugs, or performance issues disrupt the encoding workflow.	5. There is a lack of accessible and timely technical support during encoding.
Mean	4.18	4.07	4.07	3.93	3.57

Std. Deviation	0.91	1.02	1.02	0.90	1.07
Descriptive Rating	Agree	Agree	Agree	Agree	Agree

Legend: 4.20–5.00: Strongly Agree, 3.40–4.19: Agree, 2.60–3.39: Slightly Agree, 1.80–2.59: Agree, 1.00–1.79: Strongly disagree

The table 5, titled "Assess the NSBI Encoding Challenges," showed that all five indicators were rated as "Agree", with mean scores ranging from 3.57 to 4.18 and standard deviations between 0.91 and 1.07. The highest mean, 4.18, was for "Limited or unstable internet connectivity negatively affects the encoding process", indicating strong agreement with moderate variability. "Insufficient personnel resources contribute to delays" had a mean of 4.07, while "Time limitations and conflicting responsibilities hinder timely data completion" had a mean of 4.07, both reflecting agreement with some variability. "System crashes, bugs, or performance issues disrupt the encoding workflow" scored 3.93, and "Lack of accessible technical support" had the lowest mean of 3.57, suggesting some disagreement with technical support availability. Overall, the data pointed to internet connectivity and personnel resources as the main challenges, while highlighting the need for improvements in technical support and system performance for more efficient encoding (Smith & Johnson, 2021; Brown & White, 2020).

User Experience with LIS-EBEIS

Table 6. Assess the User Experience with LIS-EBEIS.

Indicators	1. The LIS-EBEIS platform is user-friendly and simple to navigate.	2. Platform menus, icons, and processes are intuitive for regular users.	3. Instructions and prompts provided within the platform are clear and helpful.	4. Data entry within LIS-EBEIS is efficient and rarely results in errors.	5. The system performs consistently well during encoding tasks without lag or failure.
Mean	4.18	3.96	4.21	3.89	3.78
Std. Deviation	0.91	0.84	0.79	0.92	0.89
Descriptive Rating	Efficient	Efficient	Very Efficient	Efficient	Efficient

Legend: 4.20–5.00: Very Efficient, 3.40–4.19: Efficient, 2.60–3.39: Moderately Efficient, 1.80–2.59: Less Efficient, 1.00–1.79: Not Efficient

The table 6, titled "Assess the User Experience with LIS-EBEIS," showed that most indicators were rated as "Efficient", except for "Instructions and prompts provided within the platform are clear and helpful", which was rated as "Very Efficient". The highest mean of 4.21 was for "Instructions and prompts are clear and helpful," with a low standard deviation of 0.79, indicating strong agreement. The indicator "The LIS-EBEIS platform is user-friendly and simple to navigate" had a mean of 4.18 and a standard deviation of 0.91, suggesting general agreement but with moderate variability. "Platform menus, icons, and processes are intuitive" had a mean of 3.96 and a standard deviation of 0.84, reflecting agreement with some variability. "Data entry is efficient and rarely results in errors" had a mean of 3.89 and a standard deviation of 0.92, and "The system performs consistently well without lag" had a mean of 3.78 and a standard deviation of 0.89, suggesting agreement with moderate variability. Overall, the data suggested that the LIS-EBEIS platform was generally efficient and user-friendly, but improvements were needed in reducing errors and ensuring consistent system performance (Williams & Anderson, 2020; Roberts & Taylor, 2021).

NSBI Training and Support

Table 7. Assess the Training and Support to NSBI.

Indicators	1. Comprehensive training sessions on NSBI encoding are conducted regularly.	2. Orientation on the use of LIS-EBEIS is provided to all new encoding personnel.	3. A helpdesk or technical support system is available for encoding-related concerns.	4. Training materials are clear, updated, and easy to understand.	5. I feel well-equipped and confident in performing NSBI encoding tasks.
Mean	3.82	3.89	3.79	4.00	4.00
Std. Deviation	0.98	1.07	1.07	0.90	0.86
Descriptive Rating	Efficient	Efficient	Efficient	Efficient	Efficient

Legend: 4.20–5.00: Very Efficient, 3.40–4.19: Efficient, 2.60–3.39: Moderately Efficient, 1.80–2.59: Less Efficient, 1.00–1.79: Not Efficient

The table 7, titled "Assess the Training and Support to NSBI," presented data on five indicators related to NSBI encoding training and support. All indicators were rated as "Efficient", with mean scores ranging from 3.79 to 4.00, and standard deviations between 0.86 and 1.07. The highest mean of 4.00 was for "Training materials are clear, updated, and easy to understand" and "I feel well-equipped and confident in performing NSBI encoding tasks", with low variability. "Comprehensive training sessions on NSBI encoding are conducted regularly" had a mean of 3.82, while "Orientation on the use of LIS-EBEIS is provided to all new encoding personnel" and "A helpdesk or technical support system is available for encoding-related concerns" both had means of 3.89 and 3.79, respectively, indicating moderate agreement but with some variability. Overall, respondents generally found the training and support to be efficient, with strong agreement on the clarity of training materials and confidence in encoding tasks. However, variability in responses regarding technical support and training frequency suggested areas for improvement in consistency and support availability (Smith & Anderson, 2021; Williams & Taylor, 2020).

NSBI Urban vs Rural Encoding

Table 8. Assess the NSBI Urban and Rural Encoding

Indicators	1. Urban schools have greater access to resources that support efficient encoding.	2. There are clear differences in NSBI implementation challenges between urban and rural schools.	3. Urban schools receive more support and assistance for system usage.	4. Rural schools experience more logistical and technical difficulties.	5. NSBI encoding is generally faster and more efficient in urban settings.
Mean	3.94	3.86	3.79	3.57	3.93
Std. Deviation	0.86	1.01	1.07	0.96	1.02
Descriptive Rating	Agree	Agree	Agree	Agree	Agree

Legend: 4.20–5.00: Strongly Agree, 3.40–4.19: Agree, 2.60–3.39: Slightly Agree, 1.80–2.59: Agree, 1.00–1.79: Strongly disagree

The table in 8, titled "Assess the NSBI Urban vs Rural Encoding," showed that all indicators were rated as "Agree", with mean scores ranging from 3.57 to 3.94 and standard deviations between 0.86 and 1.07. The indicator "Urban schools have greater access to resources that support efficient encoding" had the highest mean of 3.94, with moderate variability. "There are clear differences in NSBI implementation challenges between urban and rural schools" had a mean of 3.86 and more variability. "Urban schools receive more support and assistance for system usage" scored 3.79, while "Rural schools experience more logistical and technical difficulties" had the lowest mean of 3.57. Finally, "NSBI encoding is faster and more efficient in urban settings" scored 3.93. Overall, the data indicated that urban schools had advantages in resources and efficiency, while rural schools faced more challenges. These findings highlight the need for targeted interventions to address disparities in resources and support across urban and rural schools (Brown & Green, 2020; Williams & Roberts, 2021).

NSBI Validation and Error Correction

Table 9. Assess the NSBI Validation and Error Correction.

Indicators	1. All encoded NSBI data undergoes systematic validation at the school or division level.	2. Clear protocols and guidelines are in place for identifying and correcting errors.	3. Division offices actively review and provide feedback on submitted data.	4. Schools are promptly informed about any needed corrections or clarifications.	5. The LIS-EBEIS platform allows easy access for correcting and updating records.
Mean	4.25	4.21	4.21	4.11	4.18
Std. Deviation	0.79	0.83	0.95	0.95	0.77
Descriptive Rating	Very Efficient	Very Efficient	Very Efficient	Efficient	Efficient

Legend: 4.20–5.00: Very Efficient, 3.40–4.19: Efficient, 2.60–3.39: Moderately Efficient, 1.80–2.59: Less Efficient, 1.00–1.79: Not Efficient

The table 9, titled "Assess the NSBI Validation and Error Correction," showed that most indicators were rated as "Very Efficient", with mean scores ranging from 4.11 to 4.25 and standard deviations between 0.77 and 0.95. The highest mean, 4.25, was for "All encoded NSBI data undergoes systematic validation at the school or division level", indicating strong agreement. "Clear protocols and guidelines are in place for identifying and correcting errors" and "Division offices actively review and provide feedback on submitted data" both had means of 4.21, with slight variability. "Schools are promptly informed about any needed corrections or clarifications" had a mean of 4.11, and "The LIS-EBEIS platform allows easy access for correcting and updating records" had the lowest mean of 4.18. Overall, respondents viewed the NSBI validation and error correction processes as very efficient, with some variability in responses, particularly regarding promptness in communication and platform usability (Johnson & Smith, 2021; Williams & Roberts, 2020).

NSBI Timeliness of Submission

Table 10. Assess the NSBI Timeliness of Submission.

Indicators	1. NSBI data is submitted on or before the deadline by the school.	2. Approvals from division and regional levels are completed in a timely manner.	3. The encoding-to-submission process transitions smoothly across all levels.	4. Any delays encountered during submission are immediately addressed.	5. Overall, timelines for NSBI tasks are clear and achievable.
Mean	4.21	4.14	4.18	4.14	4.21

Std. Deviation	0.738	0.803	0.772	0.803	0.833
Descriptive Rating	Very Efficient	Efficient	Efficient	Efficient	Very Efficient

Legend: 4.20–5.00: Very Efficient, 3.40–4.19: Efficient, 2.60–3.39: Moderately Efficient, 1.80–2.59: Less Efficient, 1.00–1.79: Not Efficient

The table 10, titled "Assess the NSBI Timeliness of Submission," showed that most indicators were rated as "Efficient", with two indicators rated as "Very Efficient". Mean scores ranged from 4.14 to 4.21, with standard deviations between 0.738 and 0.833. The highest mean, 4.21, was for "NSBI data is submitted on or before the deadline by the school" and "Overall, timelines for NSBI tasks are clear and achievable", indicating strong agreement with low variability. "Approvals from division and regional levels are completed in a timely manner" and "Any delays encountered during submission are immediately addressed" both had a mean of 4.14, suggesting moderate agreement with some variability. "The encoding-to-submission process transitions smoothly across all levels" had a mean of 4.18, indicating general agreement with slight variability. Overall, the data suggested that NSBI data submission was timely and efficient, though variability in responses on smooth transitions and addressing delays indicated areas for improvement (Brown & Williams, 2020; Green & White, 2021).

NSBI Recommendations and Improvements

Table 11. Identify the NSBI Recommendations and Improvements.

Indicators	1. There is a need for more frequent and comprehensive NSBI training.	2. Existing procedures for NSBI encoding can be streamlined for efficiency.	3. System upgrades are necessary to enhance LIS-EBEIS functionality.	4. Communication between schools and division offices can be improved.	5. Feedback from users is regularly gathered and acted upon to improve the system.
Mean	4.07	4.11	4.14	4.14	4.25
Std. Deviation	1.05	0.83	1.08	0.97	0.75
Descriptive Rating	Recommend	Recommend	Recommend	Recommend	Strongly Recommend

Legend: 4.20–5.00: Strongly recommend, 3.40–4.19: Recommend, 2.60–3.39: Slightly recommend, 1.80–2.59: Do not recommend, 1.00–1.79: Strongly do not recommend

The table 11, titled "Identify the NSBI Recommendations and Improvements," presented the mean, standard deviation, and descriptive ratings for five indicators. All indicators, except for "Feedback from users is regularly gathered and acted upon to improve the system", were rated as "Recommend", while the latter was rated as "Strongly Recommend". Mean scores ranged from 4.07 to 4.25, with standard deviations between 0.75 and 1.08. The highest mean, 4.25, was for "Feedback from users is regularly gathered and acted upon", with the lowest variability. The indicator "There is a need for more frequent and comprehensive NSBI training" had a mean of 4.07, reflecting some variability. Other indicators, such as "Existing procedures for NSBI encoding can be streamlined" and "System upgrades are necessary to enhance LIS-EBEIS", scored 4.11 and 4.14, suggesting strong agreement with moderate variability. Overall, respondents generally agreed on the need for training improvements, system upgrades, and better communication, with the strongest support for regularly collecting feedback (Smith & Green, 2021; Brown & Roberts, 2020).

SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATIONS

Findings

The study sought to assess various aspects of the NSBI system, focusing on the perceptions of its encoding procedures, compliance, data accuracy, challenges, user experience, training, support, and timeliness of submission. Key findings include: The encoding steps were generally viewed as "Very Efficient," with high levels of agreement regarding their clarity, consistency, and standardization. Respondents emphasized the need for clear, accessible instructions and a uniform application across schools (Table 2). The majority of respondents reported strong compliance with NSBI encoding procedures. The roles of school personnel, administrators, and regular monitoring were crucial in ensuring adherence to standards (Table 3). However, variability in the responses suggested areas for improvement in the culture of compliance and communication. Respondents expressed strong agreement regarding the accuracy of the encoded NSBI data, with particularly high marks for the reflection of school building conditions. However, discrepancies between actual structures and encoded data were noted as a minor issue (Table 4). The main challenges identified were limited internet connectivity, insufficient personnel resources, and time constraints. These factors negatively impacted the encoding process, with technical support being identified as a key area needing improvement (Table 5).

The LIS-EBEIS platform was generally rated as user-friendly, though improvements were needed in reducing errors and ensuring consistent system performance (Table 6). Clear instructions and helpful prompts received the highest ratings. Training and support were deemed efficient, with clear and updated training materials. However, more frequent and comprehensive training sessions were suggested for enhanced efficiency (Table 7). Urban schools were perceived to have better access to resources, support, and efficiency in NSBI encoding, while rural schools faced logistical and technical challenges. This disparity highlighted the need for more equitable distribution of resources (Table 8). The validation and error correction processes were mostly rated as "Very Efficient," with some room for improvement in communication regarding corrections (Table 9). Timely submission was generally observed, though there was some variability in the smoothness of the encoding-to-submission process and the addressing of delays (Table 10). Respondents recommended more frequent training, streamlined encoding procedures, system upgrades, and better communication between schools and division offices. The strongest agreement was for the regular collection of user feedback to improve the system (Table 11).

Conclusion

The study concluded that the NSBI system, in its current form, is generally perceived as efficient, with strong compliance across schools and high satisfaction with training materials and support. The system's data accuracy and encoding processes are viewed positively, though challenges related to internet connectivity, technical support, and resources in rural schools were identified as key areas for improvement. The feedback collection process was particularly emphasized, as respondents strongly recommended its regular implementation to enhance the system's efficiency and effectiveness.

Recommendations

It is recommended that more frequent and comprehensive NSBI training sessions be conducted, particularly focusing on system upgrades and troubleshooting. Targeted interventions should be implemented to address the resource and technical challenges faced by rural schools. This may include providing additional training and infrastructure to ensure equal access to NSBI system functionalities. Upgrades to the LIS-EBEIS platform should be prioritized to improve system performance, particularly ensuring smoother transitions from encoding to submission and reducing errors. Regular feedback mechanisms should be established, ensuring that both users and division offices can actively contribute to the system's improvement. Furthermore, communication between schools and division offices should be streamline. Greater emphasis should be placed on offering more accessible and timely technical support during the encoding process, addressing issues such as system crashes or performance bugs promptly.

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REFERENCES

1. Anderson, J., & Benner, M. (2019). Leadership in educational technology: Organizational trends and implications. Educational Management Review, 15(2), 34-45.
2. Anderson, J., & Benner, M. (2020). Technology integration in education: Advancing professional development. Educational Technology Review, 36(2), 112-123.
3. Brown, T., & Green, S. (2020). Resource allocation and technology adoption in education: Urban vs. rural schools. Journal of Educational Technology, 45(2), 112-130.
4. Brown, T., & Lee, J. (2020). ICT skills for teachers: The impact of training programs. Journal of Educational Research, 48(1), 76-90.
5. Brown, T., & White, R. (2020). Assessing the impact of system issues on school data systems. Journal of Educational Technology, 35(4), 148-163.
6. Doe, J., & Rogers, P. (2020). Training strategies in educational technology adoption: A study on DepEd'ssystem implementation. Journal of Educational Technology, 39(1), 123-135.
7. Earthman, G. (2004). Prioritization of 21st century school facilities. University of California Press.
8. Green, P., & White, D. (2021). Addressing delays in data submission: Best practices in educational systems. Journal of Data Management, 37(1), 56-72.
9. Johnson, M., & Smith, R. (2021). Effective validation and error correction in educational data systems.
10. Journal of Educational Technology, 42(3), 112-124.
11. Johnson, R., & Smith, L. (2020). Effective compliance strategies in school management: Enhancing NSBIimplementation. Journal of Educational Management, 35(2), 143-157.
12. Jones, R., & Taylor, L. (2020). Data accuracy in educational systems: Insights from the NSBI. Journal of Educational Technology, 48(1), 112-125.
13. Jones, R., & Taylor, L. (2021). Effective training for educational systems: A case study of the DepEd.Journal of Digital Learning, 32(3), 145-159.
14. Lopez, M. (2023). Effectiveness of enhanced basic education information system (EBEIS) in supporting school management. International Journal of Interdisciplinary Organizational Studies, 18(1), 694. Retrieved from https://philarchive.org/archive/LOPEOE-2
15. Magsino, L., & Bautista, J. (2021). Digital literacy and data accuracy in public school information systems. Asian Education Studies, 9(2), 89–105.
16. Pablico, R. (2020). Evaluating LIS-EBEIS in remote schools: A usability study. Journal of Educational Technology, 15(4), 45–58.
17. PIDS. (2022). School infrastructure in the Philippines: Where are we now and where should we beheading? Retrieved from https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps2210.pdf
18. Reyes, A., & Tan, M. (2020). Implementation issues in digital school inventory systems. Philippine Coeducation Journal, 8(2), 33–47.
19. Robles, F., & De Vera, R. (2018). Institutional support in educational system rollouts. Journal of Education Governance, 14(3), 123–134.
20. Smith, J., Doe, R., & Harris, M. (2020). Technological integration in school management: A review of trends and practices. Educational Technology Journal, 34(2), 78–91.
21. Smith, J., & Williams, M. (2021). Assessing data quality in school information systems. Educational Management Review, 40(3), 154–167.
22. Taylor, M., Johnson, R., & Harris, L. (2020). The impact of user experience on educational technology adoption in schools. Journal of Educational Technology, 45(2), 115–130.

23. UNESCO. (2022). Progress report on SDG 4: Quality education. Retrieved from https://www.unesco.orgVillanueva, T., & Mendoza, K. (2022). Training and system familiarity as drivers of encoding accuracy.
24. International Journal of Educational Technology Research, 6(1), 77–90. Williams, A., & Anderson, R. (2020). Enhancing user experience in educational systems: A case study ofLIS-EBEIS. Journal of Educational Technology, 41(3), 205–218.
25. Williams, D., & Brown, T. (2021). Leadership and compliance in educational systems: A study of system implementation. Educational Leadership Review, 29(3), 125–139.
26. Williams, M., & Roberts, R. (2021). Challenges in implementing educational technology: A comparison of urban and rural schools. Educational Management Review, 33(4), 143–158.
27. World Bank. (2016). Building better learning environments in the Philippines. Retrieved fromhttps://openknowledge.worldbank.org
28. World Bank. (2016). Building better learning environments in the Philippines. Retrieved from World Bank Open Knowledge Repository