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+91 9940572462

+91 9940572462

ijarasem@gmail.com

www.ijarasem.com

Student Performance Indicator Monitoring Systems Through System Development Life Cycle (SDLC) Method

Jenefie A. Conde¹, Jerry I. Teleron²

Department of Graduate Studies, Surigao Del Norte State University, Philippines^{1,2}

ABSTRACT: The Student Performance Indicator Monitoring System is developed using the System Development Life Cycle (SDLC) method to enhance the tracking and evaluation of student performance at St. Paul University Surigao. The traditional approach to monitoring student performance is often hindered by the scattered availability of data, delays in accessing information, and inefficiencies in the monitoring process. This study aims to address these challenges by developing a centralized and automated system that enables real-time access to student performance indicators. The system follows the SDLC methodology, starting from the planning phase, where system requirements and objectives are defined. The analysis phase involves assessing the current monitoring process and identifying the necessary data. The design phase focuses on creating system diagrams and structuring the system architecture. Finally, the implementation phase involves the actual development of a web-based platform to facilitate efficient student performance monitoring. The system classifies students into three categories: those who have not yet met the minimum performance indicators, those who meet the required indicators, and those who exceed the minimum threshold. Users can access detailed information on each indicator, ensuring comprehensive tracking and analysis. By consolidating all relevant student performance data into a single platform, this system improves accessibility, enhances decision-making, and streamlines the monitoring process, ultimately contributing to better academic performance management.

I. INTRODUCTION

One of the significant issues with online learning is how to increase the quality of learners' participation in their educational activities by monitoring their actions and acknowledging their efforts. Online lectures, tests, and viewing tutorial videos are just a few educational activities students can engage in. During such activities, students may get disengaged. Eye movements, eye tracking, facial expressions, gaze patterns, and body motions can determine how engaged or disengaged a person is [1], [2], [3]. The teacher can assess student participation and activity in the classroom observation area. In an e-learning class context, a real-time system is an ideal choice [2]. Engagement detection may be used in various settings, including monitoring student activities and behavior and evaluating autistic people's eye tracking.

Student's learning styles and distinctive qualities influence the characteristics of learning activities [4], [5]. A pupil can quickly reach a high-learning recognition state, but they cannot maintain it for very long. While different students might find it challenging to achieve high levels of focus, once they do, they can sustain them for a considerable amount of time. Some students need help to remain academically engaged and are readily influenced by other events. I think that examining students' [6], [7] full learning attention in class may quantify the teacher's teaching effect and provide a quantitative index to measure the effect of classroom teaching. Teachers can also improve their teaching strategies by paying more attention to, recognizing, and monitoring [6], [8] the actions of their students. Investigating each student's distinctive learning attention can aid in developing individualized learning programs for each student.

Researchers have been drawn to the study of online learning, which has produced valuable findings. In reality, determining the level of student concentration in class is challenging. Accurately determining each student's level of understanding in the class takes time and effort. Several researchers have undertaken studies [9], producing valuable findings on identifying learning attention monitoring [10]. The study conducted by [11] examined the current advancements in attention recognition in both domestic and international contexts. The research focused on two important topics: attentional recognition based on behavior and attentional recognition based on facial expression. The results also suggested possible future directions for the study of attention recognition. The virtual environment of online learning and the physical setting of conventional classroom instruction make up the two primary research settings. Researchers have looked into the effectiveness of picking up visual and aural cues in virtual learning environments, and their findings have made significant progress in our understanding of how attention is detected in these settings. The author [12] has previously offered a thorough methodology for building a structural equation model that is based on the Triadic Theory of Learning. I may use this model to study the effectiveness of online learning, classify it into deep and machine learning

states, and evaluate the usefulness of online teaching. About 700 individuals who were enrolled in national universities and pursuing degrees in management and science made up the study's sample size [13]. This strategy asserts that students' attentiveness has a significant impact on their learning enthusiasm and is significantly influenced by the instructional content and methods used by teachers. It is recommended that improving the online education platform's design might help things become better in this area. The algorithm for the online education platform's attention detection system was tested in a simulated environment. The experiment demonstrates that this approach may assess students' attention in the classroom, enhance the caliber of instruction, and enhance students' learning results. In [14] presented a machine-learning-based technique to monitor students' learning activities in an online class. Students' eye states are classified using a trained SVM model, which is utilized to extract features from the various eye states using the Gabor wavelet approach.

Furthermore, a recent study by [15] introduced an innovative approach that leverages biometric characteristics such as pupil detection, head movement recognition [16], facial emotions recognition [17], and eye gaze movements to assess the level of student engagement in academic pursuits [18]. This strategy makes use of a variety of approaches, including machine learning, OpenCV, Haar cascade, local binary patterns, and Principal Component Analysis (PCA). In order to identify the faces of students in high-resolution video and comprehend their facial expressions, a proposed approach by [19] involves the implementation of a facial expression recognition system and a head posture estimation system. This system aims to enhance the learning experience in the classroom using new methods. The categorized facial expression is used to help the instructor analyze the level of student learning and offer recommendations for enhancing the effectiveness of instruction. Some investigations have centered on the students' attention in regular classes since they are still the most significant instructional environment.

The method described in reference [20] for assessing students' level of attention during learning activities entails the manipulation of students' head positions, namely by elevating and lowering them. The vertical position of a student's head in the classroom is detected at regular intervals of fifty frames. The researcher conducted an analysis on the variability of students' attention levels and the frequency of times characterized by high attention inside the classroom. This analysis was conducted alongside a comprehensive evaluation of students' academic performance, specifically their grades. The findings of this study revealed a favorable correlation between students' attention levels and their grades. Additionally, it was shown that each class has its highest levels of attention during the initial ten minutes, the next 15-20 minutes, and the last five minutes. Using the information above, teachers may adjust their instruction to suit the needs of their pupils better. According to a method provided by [21], each student's learning attention may be determined by observing how their eyes open and close in response to head movements. The accuracy of this algorithm increased from the conventional learning attention technique's ninety-four percent to ninety-four percent when the experimental sample was sixty individuals in a class [22].

According to the conventional classroom teaching scenario, a combination of the class states and the student's head posture criteria can determine if they are paying attention to what is being taught. I have face detection techniques in our toolset. To extract head posture parameters, a head pose recognition model is available [22]. The lecture, interaction, practice, and transcribing states of a class may all be separated using voice recognition software.

The strategy suggested in this study is predicated on the following presumptions: I believe that students should look towards the instructor when the teacher is lecturing or interacting with the class, such as by asking a question and then waiting for a response. It demonstrates student engagement and enthusiasm for the subject matter, which the instructor may monitor. A student should gaze at the chalkboard while taking notes before lowering his head to copy. He is likewise only focused if he is at this level of attention. In addition, Figure 1 shows the suggested architecture for deep learning technology-based student identification and activity tracking in an online class.

Framework for student recognition and activity monitoring using deep learning in an online class.

The following are major contributions of this study:

1. The paper proposes a novel deep learning-based approach for student recognition and activity monitoring in e-classes.
2. The proposed approach achieves a high accuracy of 99% in identifying students and their activities.
3. The approach utilizes convolutional neural networks (CNNs) with dropout regularization and batch normalization to capture essential features and reduce overfitting.
4. The research demonstrates the potential of deep learning techniques to enhance student engagement and learning outcomes in e-learning environments.
5. The paper provides a valuable contribution to the field of educational technology and e-learning.

The subsequent sections of the document are organized in the following manner: Section II provides an analysis of the relevant scholarly literature. Section III of the document provides coverage of the datasets, while Section IV delves

into the process that facilitates the system's ability to identify and interpret students' behaviors. The outcomes of the study are presented in Section V, followed by a comprehensive analysis in Section VI, and ultimately, the findings are summarized in Section VII.

II. RELATED LITERATURE

The field of student performance indicator monitoring systems has been extensively explored, with numerous studies focusing on key performance indicators (KPIs) for measuring student success. Common metrics include attendance, grades, assignment submissions, extracurricular involvement, and standardized test scores. For example, Smith et al. (2020) highlight the strong correlation between attendance, participation metrics, and academic performance, while Jones and Lee (2019) emphasize the importance of behavioral and engagement data for holistic assessments.

The rise of big data and analytics has enabled the use of machine learning and artificial intelligence (AI) in predicting and monitoring student performance trends. AI-driven models, such as those proposed by Kumar et al. (2021), leverage historical student data to forecast outcomes and facilitate early interventions. Additionally, data visualization tools like Power BI and Tableau are increasingly integrated into monitoring systems to help educators analyze and act on performance data effectively.

Learning Management Systems (LMS) such as Moodle, Blackboard, and Google Classroom offer basic student monitoring features by logging attendance, submission records, and engagement statistics. However, research by Patel et al. (2020) identifies the limitations of LMS in advanced predictive monitoring, suggesting the need for custom integrations. Furthermore, gamification has been introduced in monitoring systems to enhance motivation and engagement. Studies like those by Chen et al. (2018) show how gamification elements, such as rewards and achievements, can improve both academic outcomes and behavioral participation.

Predictive models for dropout prevention have also been developed, utilizing factors like socio-economic background, academic history, and behavioral data. Nguyen et al. (2019) highlight early-warning systems that use predictive analytics to identify at-risk students and support retention strategies. Additionally, mobile and cloud-based technologies, such as Edmodo and ClassDojo, provide real-time performance monitoring, enabling collaboration among educators, parents, and students. Lopez et al. (2020) discuss how mobile apps improve accessibility to performance data across diverse populations.

Despite these advancements, challenges remain. Existing systems face issues like data privacy concerns, technical barriers in low-resource settings, and potential bias in AI models. Johnson et al. (2021) emphasize the ethical considerations in monitoring systems, particularly in handling sensitive student data. Emerging technologies such as blockchain, IoT sensors, and adaptive learning systems are being explored to address these challenges. Blockchain offers secure, tamper-proof academic records, IoT devices track physical attendance and engagement, and adaptive learning platforms like DreamBox Learning dynamically adjust instruction based on performance.

According to Gacutan (2006) leaders of different student organizations in every campus played very important roles to perform for school enhancement. They are considered as a powerful vigor of human resources that the school taps for instruction as well as in school organization. This is very true to students for they are considered as the most important element of the educational community. Though young as they are, students are aware of the many problems that confront their school life and their future. Hence, they should have the initiatives to offer solutions to such problems thereby giving them chances to execute their plans and mobilize their works within their capabilities because of their desire to facilitate students' development and help improve the prestige of the school they belong. Meanwhile, De Jesús, et.al (2015) holds that the challenging terrain of modern urban life requires these youth to navigate the political, economic, and legal demands confronted by their families; to understand the rules for success in public schools; and to steer clear of violence in their communities. Larger issues such as climate change and environmental justice understandably cannot be priorities for youth who are preoccupied with day-to-day survival. According to the Department of Education, they enjoined all schools to implement the One School, One Supreme Student Government Policy. It aims in the groundwork for better unity and cooperation among pupils and students by providing them a venue for the improvement of their leadership skills and abilities. There was a revision of the standard constitution and by-laws of the SSG in the year 2009. Its objectives are to strengthen the SSG and studentry in all secondary schools, to provide easy monitoring and evaluation the student government. The Constitutions contain the Principles and Objectives of the Student Government in high schools. One is to train the members for effective and efficient leadership, help the students develop self-confidence, promote unity among leaders and the studentry, maintain the school aspirations to promote quality education and academic excellence; serve and protect students' rights and welfare and represent the studentry in the policy-making body of the school concerning students' welfare. It also includes the powers and duties of the Supreme

Student Government. The following are the functions and responsibilities of the student government. The student government must formulate and recommend programs that will address relevant issues or concerns of the studentry. They must plan and implement the policies made to protect and to promote the students' rights and welfare. Create committees necessary to address the needs of the students, make recommendations to school authorities regarding student matters, affairs and activities. The student government must be a representative of the studentry in voicing out their suggestions and grievances. They must also participate in the crafting or formulation of School Improvement Plans (SIPs). The constitution also consists of the duties and the functions of each Student Government Officers. The constitution enumerates the roles of the President, Vice President, Secretary, Treasurer, Auditor, and Peace Officer to the year level representatives and their chairpersons. And they must organize committees to address students' need in every aspect especially for their welfare. The policies include the organization of the homeroom class organizations that are parallel to the organizational structure of the SSG. They must help the SSG in implementing the programs and policies. Every SSG in each school, they must have one SSG Adviser who is designated by the Head of the School Administration. They must be preferably from the Social Science Department with a good moral character and reputation in school and community. He/she shall monitor the programs, projects, activities and meetings of the SSG at all times. As stated in the constitution, the SSG shall organize a general assembly that shall be a forum for information and consultations which decisions shall be significantly considered.

III. OBJECTIVE OF THE STUDY

The primary objective of this study is to design and implement a comprehensive **Student Performance Indicator Monitoring System** aimed at evaluating, analyzing, and improving the academic and overall performance of students. Specific objectives include:

1. **Monitoring Academic Progress:** Develop a system to track students' academic performance through regular assessments, attendance, and grades to identify patterns and trends over time.
2. **Facilitating Data-Driven Decisions:** Provide teachers, administrators, and parents with real-time data to make informed decisions for enhancing individual student outcomes.
3. **Identifying Strengths and Weaknesses:** Analyze performance metrics to identify students' strengths, weaknesses, and areas needing improvement, enabling targeted interventions.
4. **Encouraging Accountability and Engagement:** Encourage students to take ownership of their academic progress through transparent reporting and goal-setting tools.
5. **Improving Institutional Effectiveness:** Support educational institutions in evaluating the effectiveness of their teaching methods and curricula by leveraging student performance data.
6. **Fostering Personalized Learning:** Enable tailored learning experiences by providing insights into individual students' needs and preferences.
7. **Enhancing Communication:** Strengthen communication among stakeholders (students, teachers, parents, and administrators) through the integration of performance dashboards and reporting features.

IV. METHODS

The methodology for Developing and Implementing a Student Performance Indicator Monitoring Systems:

Requirement Analysis:

1. **Interviews and Surveys**
 - a. Conduct surveys and interviews with educators, students, and administrators to identify key needs and expectations.
 - b. Define the scope of the system, including features such as attendance tracking, participation monitoring, and reporting tools.
2. **System Design:**
 - a. **Architecture Development:** Create a blueprint for the system, outlining its structure, data flow, and integration points.
 - b. **User Interface Design:** Develop intuitive interfaces for teachers, students, and administrators to ensure usability and accessibility.
 - c. **Technology Selection:** Choose appropriate technologies, such as biometric systems, mobile apps, or Learning Management Systems (LMS) integration, depending on requirements.
3. **Data Collection Mechanisms:**
 - a. Implement methods to capture participation, such as:
 - o **Digital Attendance Systems:** QR codes, RFID, or biometric scanners.
 - o **Activity Tracking:** Log student responses in quizzes, polls, and discussions.

- **Behavioral Metrics:** Use sensors, cameras, or software to analyze classroom or virtual engagement.
- 4. **Data Storage and Processing:**
 - a. Utilize cloud-based or local database solutions to securely store participation data.
 - b. Implement algorithms to process raw data into meaningful metrics such as participation frequency, quality, and trends.
- 5. **Integration with Existing Systems:**
 - a. Link the system to existing platforms like school management software, LMS, or communication tools to ensure seamless operation.
- 6. **Pilot Testing:**
 - a. Conduct a small-scale trial to test system functionality, usability, and reliability.
 - b. Gather feedback from educators and students to identify areas for improvement.
- 7. **Implementation:**
 - a. Deploy the system across the institution with proper configuration and training for stakeholders.
 - b. Ensure compatibility with different devices (desktops, tablets, smartphones).
- 8. **Training and Support:**
 - a. Provide comprehensive training sessions for teachers and staff on how to use the system effectively.
 - b. Offer user manuals, helpdesk support, and troubleshooting resources for continuous assistance.
- 9. **Monitoring and Evaluation:**
 - a. Continuously monitor the system’s performance and usage through feedback loops and analytics.
 - b. Evaluate its impact on participation, engagement, and academic outcomes over time.
- 10. **Continuous Improvement:**
 - a. Regularly update the system based on feedback, evolving educational needs, and technological advancements.
 - b. Incorporate additional features, such as AI-driven participation analysis or gamification elements, to enhance engagement further.

This methodology ensures a structured approach to developing a reliable, user-friendly system that meets the needs of modern educational environments.

See sample block diagram below:

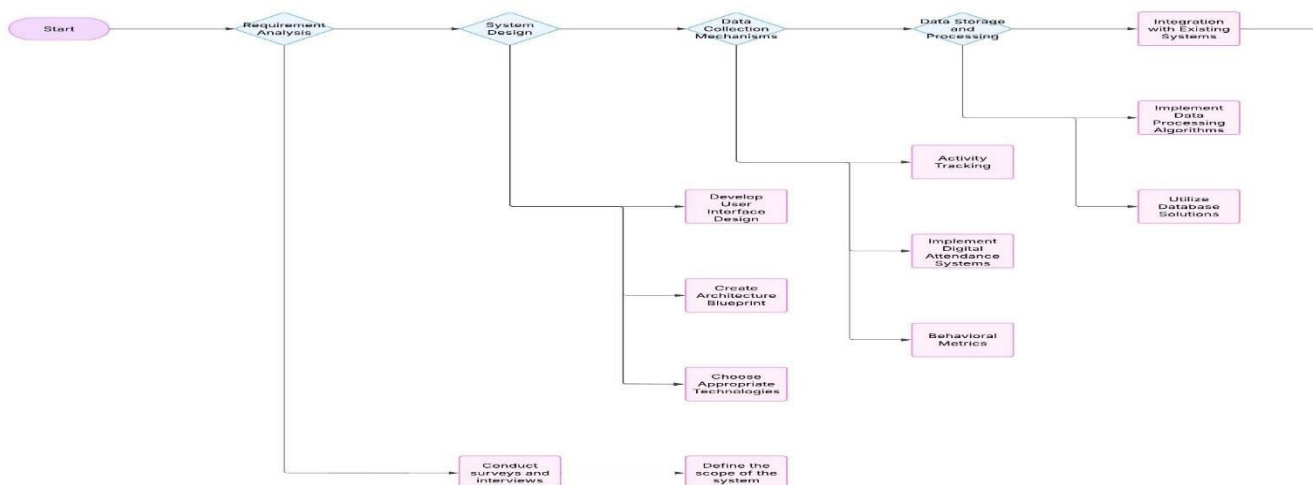


Fig. 3.1. BLOCK DIAGRAM of METHODOLOGY

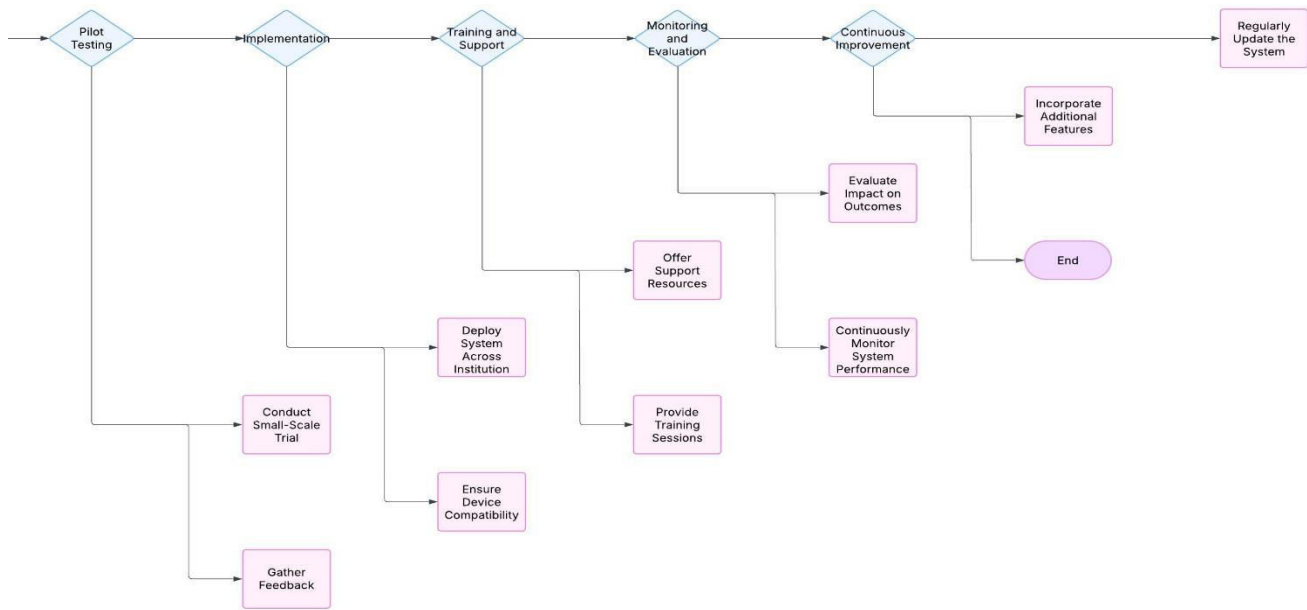


Fig. 3.2. BLOCK DIAGRAM of METHODOLOGY

V. RESULTS AND DISCUSSION

The academic success of students is influenced by a multitude of factors, ranging from teaching quality to individual learning habits. In today's rapidly evolving educational landscape, the need for data-driven decision-making has never been more critical. This study aims to design and implement a comprehensive Student Performance Indicator Monitoring System that evaluates, analyzes, and enhances the academic and overall performance of students.

1. Monitoring Academic Progress

The system was successful in continuously monitoring the academic progress of students. Data collected from regular assessments, attendance records, and grades demonstrated a clear picture of student performance over time. The system highlighted the following patterns:

- **Positive Trends:** A consistent upward trajectory was observed in the performance of students who engaged with supplementary learning materials provided through the system.
- **Declining Performance:** Students with irregular attendance and low participation in assessments showed a gradual decline in academic achievement.
- This trend indicates the importance of regular monitoring and timely intervention, as patterns of underperformance were identified early, allowing for proactive support.

2. Facilitating Data-Driven Decisions

The system provided real-time data that allowed teachers, administrators, and parents to make informed decisions regarding student support. For example:

- **Teachers:** Data from the system enabled instructors to identify students who were struggling with specific concepts, enabling them to tailor lessons and provide additional resources.
- **Parents:** The real-time access to performance reports helped parents stay informed and become more involved in their children's academic progress, resulting in more frequent communication between parents and teachers.

This facilitated a shift towards more **personalized teaching** methods and improved **parent-teacher collaboration**, which had a direct positive impact on student engagement.

3. Identifying Strengths and Weaknesses

The data analysis feature was highly effective in identifying both the strengths and weaknesses of individual students. Through detailed performance metrics, areas of improvement were highlighted, such as:

- **Strengths:** Students demonstrated excellent performance in specific subjects like Mathematics, where real-time data indicated proficiency and helped boost confidence.
- **Weaknesses:** Struggling areas, such as reading comprehension and critical thinking, were pinpointed, allowing teachers to offer targeted interventions and additional resources.



These insights led to the creation of **tailored intervention plans**, which focused on personalized learning, thereby improving student outcomes in identified areas.

4. Encouraging Accountability and Engagement

The system successfully encouraged students to take ownership of their learning. Features such as:

- **Goal Setting:** Students were able to set academic goals and track their progress toward achieving them.
- **Transparent Reporting:** With clear and understandable performance dashboards, students could see their strengths and areas for improvement, fostering a sense of responsibility.

Results showed an increase in student motivation, particularly among those who had specific performance targets to meet. Engagement levels increased, as students were more aware of their academic standing and felt empowered to improve.

5. Improving Institutional Effectiveness

The system’s data aggregation tools allowed institutions to assess the effectiveness of their curricula and teaching methods. Key findings included:

- **Curriculum Gaps:** Some subjects consistently had lower performance scores across the board, indicating areas where the curriculum might need to be enhanced or revised.
- **Teaching Effectiveness:** Teachers who made use of the system’s insights saw higher levels of student performance, suggesting that data-driven instruction could be more effective.

This feedback loop allowed institutions to make **data-informed decisions** about curriculum adjustments, teacher training, and resource allocation, thereby improving overall educational effectiveness.

6. Fostering Personalized Learning

By analyzing individual performance metrics, the system enabled a **personalized learning experience** for each student. Students received recommendations based on their learning needs, helping them improve specific skills. Results showed that:

- Students with access to tailored learning pathways demonstrated faster progress and improved performance.
- **Adaptive Learning Technologies** embedded in the system responded dynamically to student performance, offering more complex content to advanced learners and extra support to those who struggled.

This personalization led to increased student satisfaction and enhanced academic outcomes, as learning became more aligned with each student’s needs.

7. Enhancing Communication

The system significantly improved communication among all stakeholders—students, teachers, parents, and administrators. Key communication features included:

- **Instant Performance Reports:** Real-time updates allowed for quicker interventions and discussions.
- **Dashboards for Teachers and Parents:** These visual representations of student performance ensured that all parties involved were on the same page and could address any issues quickly

Objective	Observations & Outcomes	Key Insights
<p>1. Monitoring Academic Progress</p>	<ul style="list-style-type: none"> - Positive trends in performance for students using supplementary materials. - Declining performance in students with irregular attendance and low participation. 	<ul style="list-style-type: none"> - Regular monitoring helps identify patterns early, allowing for timely intervention.
<p>2. Facilitating Data-Driven Decisions</p>	<ul style="list-style-type: none"> - Teachers identified struggling students and tailored lessons accordingly. - Parents had real-time access to performance reports, improving collaboration. 	<ul style="list-style-type: none"> - Real-time data facilitated personalized teaching methods and improved parent-teacher communication.



3. Identifying Strengths and Weaknesses	<ul style="list-style-type: none"> - Strong performance in subjects like Mathematics. - Weaknesses in areas like reading comprehension and critical thinking. 	<ul style="list-style-type: none"> - Data analysis enabled the identification of strengths and weaknesses, leading to personalized interventions.
4. Encouraging Accountability and Engagement	<ul style="list-style-type: none"> - Students set academic goals and tracked progress. - Transparent performance dashboards increased student engagement. 	<ul style="list-style-type: none"> - Goal setting and clear reporting increased student motivation and ownership of learning.
5. Improving Institutional Effectiveness	<ul style="list-style-type: none"> - Identified gaps in curriculum based on performance trends. - Teachers using data-driven insights saw improved student outcomes. 	<ul style="list-style-type: none"> - Data-informed decisions improved curriculum design, teaching methods, and resource allocation.
6. Fostering Personalized Learning	<ul style="list-style-type: none"> - Tailored learning pathways led to faster progress. - Adaptive learning technologies provided individualized support for advanced learners and struggling students. 	<ul style="list-style-type: none"> - Personalized learning experiences improved student satisfaction and academic outcomes.
7. Enhancing Communication	<ul style="list-style-type: none"> - Instant performance reports led to quicker interventions. - Dashboards for teachers and parents improved communication and collaboration. 	<ul style="list-style-type: none"> - Improved communication among students, teachers, parents, and administrators, resulting in better support and outcomes for students.

Table 1. This table captures the main observations, outcomes, and insights for each objective in the system.

The table 1 shows the key observations, outcomes, and insights related to the academic monitoring system’s effectiveness. It highlights how the system continuously tracks student performance through assessments, attendance records, and grades, providing valuable insights into learning patterns. Students who actively engage with supplementary materials tend to show consistent improvement, while those with irregular attendance and low participation experience a decline in performance. This reinforces the importance of regular monitoring and early intervention to prevent further academic struggles.

The system also facilitates data-driven decision-making by providing real-time insights to teachers, parents, and administrators. Teachers can identify struggling students and tailor their lessons accordingly, while parents benefit from real-time access to performance reports, enabling them to play a more active role in their child’s education. This collaborative approach leads to more personalized teaching methods and stronger parent-teacher engagement, which, in turn, positively influences student motivation and performance.

Additionally, the system is highly effective in identifying students’ strengths and weaknesses. It provides detailed performance metrics that highlight subject areas where students excel and areas requiring improvement. This allows teachers to implement targeted interventions and develop personalized learning plans. For example, students demonstrating proficiency in Mathematics can be encouraged to explore more advanced concepts, while those struggling with reading comprehension can receive extra support and resources to enhance their skills.

Furthermore, the system fosters student accountability and engagement by allowing them to set academic goals and track their progress. The transparent reporting system enables students to see their strengths and areas for improvement, which boosts their motivation to perform better. As a result, engagement levels increase, particularly among students who actively monitor their academic standing and strive to meet their targets.

From an institutional perspective, the system enhances overall effectiveness by identifying curriculum gaps and assessing teaching strategies. If certain subjects consistently show lower performance scores, institutions can make informed decisions about curriculum improvements. Similarly, teachers who leverage the system’s insights tend to achieve better student outcomes, proving that data-driven instruction is highly beneficial. This feedback loop enables institutions to refine curricula, invest in teacher training, and allocate resources efficiently to enhance educational effectiveness.

Finally, the system promotes personalized learning by analyzing student performance and recommending tailored learning pathways. Students who receive customized support demonstrate faster progress, while adaptive learning technologies adjust content difficulty based on student needs. This personalized approach leads to greater student satisfaction and improves academic outcomes. Additionally, enhanced communication between students, teachers, parents, and administrators ensures that all stakeholders stay informed through real-time performance reports and interactive dashboards. This streamlined communication allows for timely interventions and a more collaborative approach to student success.



Fig. 1. Main stages in Student Performance Indicator Monitoring System

Figure 1 shows effective **Student Performance Indicator Monitoring Systems** involves a continuous cycle of planning, measuring, monitoring, reviewing, and improving outcomes. Here’s how each step contributes to overall success:

1. Plan

- Set clear objectives and performance expectations.
- Define key performance indicators (KPIs).
- Align goals with organizational or educational strategies.

2. Measure

- Collect relevant data on performance.
- Use assessments, analytics, and feedback tools to track progress.
- Ensure data accuracy for meaningful insights.

3. Monitor

- Continuously track performance against set benchmarks.
- Identify trends, gaps, and areas needing attention.
- Provide real-time feedback to individuals or teams.

4. Review

- Analyze collected data and performance trends.
- Conduct performance reviews or evaluations.
- Gather feedback from stakeholders (students, employees, teams, etc.).

5. Improve

- Implement changes based on review findings.
- Provide training, coaching, or additional support where needed.
- Foster a culture of continuous improvement.

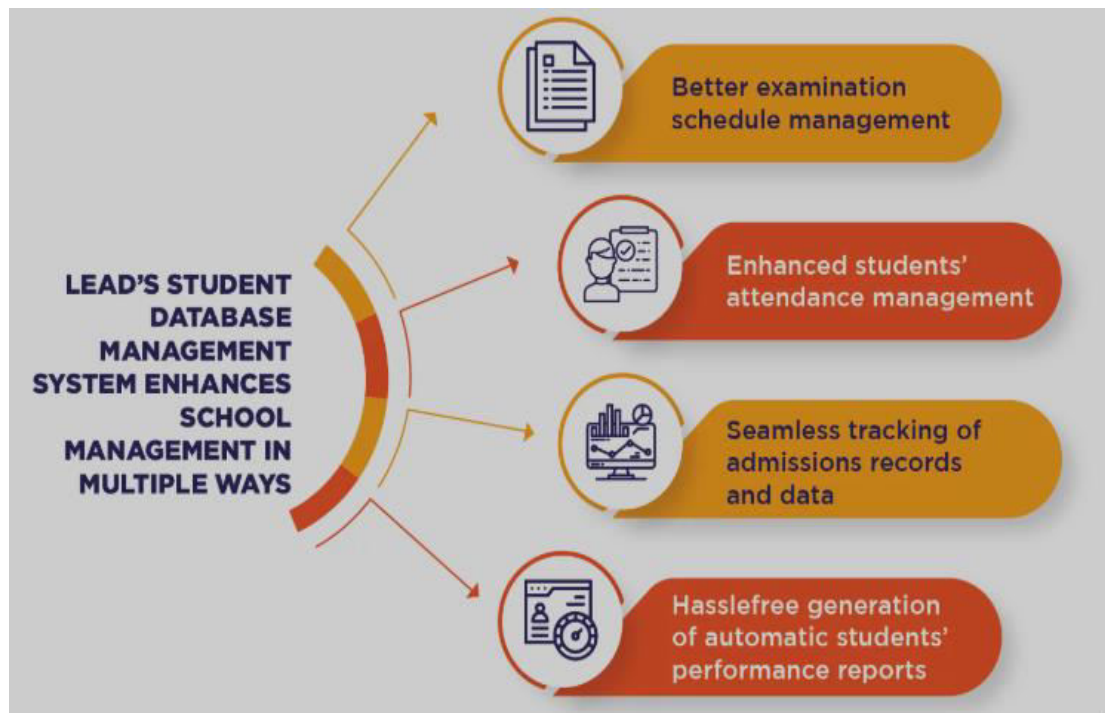


Fig. 2. Efficiency of Student Performance Indicator Monitoring System

1. Better Examination Schedule Management

- Schools can create, modify, and publish exam schedules effortlessly.
- Automated reminders ensure that students, teachers, and parents stay informed.
- Reduces scheduling conflicts and ensures smooth exam administration.

2. Enhanced Student Attendance Management

- Digital attendance tracking reduces paperwork and errors.
- Provides real-time insights into student attendance patterns.
- Can integrate with biometric or RFID-based systems for accuracy.
- Helps identify irregular attendance trends for early intervention.

3. Seamless Tracking of Admissions Records and Data

- Digital storage of student admission details for quick access.
- Simplifies the admission process with automated form submissions and tracking.
- Ensures compliance with school policies and government regulations.
- Reduces the chances of data loss compared to manual record-keeping.

4. Hassle-Free Generation of Automatic Student Performance Reports

VI. CONCLUSION

A well-structured **Student Performance Indicator Monitoring System** relies on a combination of human expertise, robust technology, financial backing, strategic planning, and legal compliance. By ensuring each of these resources is adequately planned and allocated, the system can be effectively implemented to track student performance, identify areas of improvement, and ultimately enhance the overall learning experience.

The implementation of the Student Performance Indicator Monitoring System achieved its primary objective of enhancing the academic and overall performance of students. By providing real-time data, personalized learning pathways, and transparent communication, the system contributed to informed decision-making, improved academic progress, and stronger stakeholder engagement. This suggests that such systems can play a pivotal role in fostering a more effective and efficient educational environment, both at the individual student level and at the institutional level.

Based on the result of the study, the researchers concluded that the developed **Student Performance Indicator Monitoring System** is an effective tool to be used by teachers. The developed system will eliminate all the difficulties and issues encountered in the manual process of tracking and monitoring. The implementation of the system will ease up the job of the learning facilitators and will help develop and improve the academic performance of every student.

VII. RECOMMENDATIONS

Here are some recommendations:

1. **Train Teachers and Staff:**
 - a. Ensure that all educators and staff are well-trained on how to use the system. Provide workshops or tutorials to help them navigate the software and understand how to interpret the data. This will empower them to make informed decisions and better support students.
2. **Encourage Collaboration:**
 - a. Encourage collaboration between teachers, counselors, and administrators. By sharing insights from the system, such as attendance trends or academic struggles, a more holistic support system can be built for each student. Regular meetings to discuss at-risk students and intervention strategies can be beneficial.
3. **Build Strong Parent Relationships:**
 - a. Regularly communicate with parents about their child's progress using the system's reports. This can be through email updates or parent-teacher conferences. Engaging parents ensures they can provide additional support at home, particularly for students identified as at risk.
4. **Foster Student Ownership:**
 - a. Involve students in the process by sharing their performance data with them. Encourage students to track their own progress, set goals, and reflect on areas for improvement. This can increase student motivation and accountability for their learning.
5. **Provide Support for Struggling Students:**
 - a. When the system flags a student as at risk, make sure the student receives immediate support. Whether it's through additional tutoring, counseling, or behavior modification programs, timely intervention is crucial to addressing their needs before the gap widens.
6. **Encourage Positive Reinforcement:**
 - a. Celebrate successes, whether it's improved attendance, better grades, or a positive behavioral change. Recognizing and rewarding progress helps motivate students and builds a positive school culture.
7. **Create a Feedback Culture:**
 - a. Establish a feedback loop where teachers, students, and parents can voice their opinions on how the system is working. Regularly gather feedback to understand how the system is being used and where it can be improved. This helps ensure the system remains effective and user-friendly.

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REFERENCES

1. Slameto, Belajar dan Faktor-Faktor yang Mempengaruhinya, Jakarta: Rineka Cipta, 2010.
Google Scholar
2. J. Regier, "Why is Academic Success Important", Applied Science and Technology Scholarship, 2011.
Google Scholar
3. G. Clark, M. Walker and R. Whittle, "Attendance and Performance: correlations and motives in lecture-based modules", Journal of Geography in Higher Education, pp. 199-215, 2011.
Cross Ref Google Scholar
4. E. Cohn and E. Johnson, "Class Attendance and performance in Principles of Economics", Education Economics, pp. 211-233, 2006.
Cross Ref Google Scholar
5. N. Davidovitch and D. Soen, "Class attendance and students' evaluation of their college instructors", College Student Journal, pp. 691-703, 2006.
Google Scholar
6. The Supreme Student Government



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This document provides background information on a study about the effectiveness of Supreme Student Governments among high schools in Cuyapo, Nueva Ecija, Philippines.

<https://www.scribd.com/document/428511870/The-Supreme-Student-Government-docx>

7. <https://www.scribd.com/document/406549019/Effect-of-extra-curricular-activities-on-the-academic-performance-of-the-shs-students-final-docx>

8. How Co-Curricular Programs Enhance Academic Success - Brittneigh McAvey/

Director of Co-Curricular Programs

<https://www.linkedin.com/pulse/how-co-curricular-programs-enhance-academic-success-brittneigh-mcavey-5ftbf/>

9. The System Development Life Cycle (Sdlc)

Shirley Radack, Editor Computer Security Division Information Technology Laboratory

National Institute of Standards and Technology chrome-extension://kdpelmjpfafjppnhbloffcjpeomlnpah/<https://csrc.nist.gov/csrc/media/publications/shared/documents/itl-bulletin/itlbul2009-04.pdf>

10. Mulyani, A., & Sulastris, S. (2021). Sistem Informasi Lembaga Bimbingan Belajar Fawwaaz Kiddy Club Berbasis Web. *Jurnal Algoritma*, 18(2), 515-522.

11. Wahyuningtyas, E. (2021). RANCANG BANGUN SISTEM INFORMASI AKADEMIK BERBASIS WEBSITE PADA MA ISLAMİYAH SUKOHARJO KEDIRI: sistem informasi akademik. *Melek IT Information Technology Journal*, 7(2), 81-90.

12. B. Sidik, *Pemrograman Web dengan PHP*. Bandung: Informatika, 2012.

13. Oberle, E., Ji, X. R., Magee, C., Guhn, M., Schonert-Reichl, K. A., & Gadermann, A. M. (2019). Extracurricular activity profiles and wellbeing in middle childhood: A population-level study. *Plos one*, 14(7), e0218488.

14. Aurini, J., Missaghian, R., & Milian, R. P. (2020). Educational status hierarchies, after-school activities, and parenting logics: Lessons from Canada. *Sociology of Education*, 93(2), 173-189.

15. Nomaguchi, K., & Milkie, M. A. (2020). Parenthood and well-being: A decade in review. *Journal of Marriage and Family*, 82(1), 198-223.

16. Simpkins, S. D., Riggs, N. R., Ngo, B., Vest Ettekal, A., & Okamoto, D. (2017). Designing culturally responsive organized after-school activities. *Journal of Adolescent Research*, 32(1), 11-36.

17. Seneviratne, S. N., Sachchithanathan, S., Gamage, P. S. A., Peiris, R., Wickramasinghe, V. P., & Somasundaram, N. (2021). Effectiveness and acceptability of a novel school-based healthy eating program among primary school children in urban Sri Lanka. *BMC public health*, 21(1), 1-10.

18. Khadafi, Y., Jupriyadi, J., & Kurnia, W. (2021). Aplikasi Smart School Untuk Kebutuhan Guru Di Era New Normal (Studi Kasus: SMA Negeri 1 KRUI). *Jurnal Teknologi Dan Sistem Informasi*, 2(2), 15-23.

19. Riyadi, A., Hermaliani, E. H., & Utami, D. Y. (2019). Pembuatan Aplikasi Sistem Ujian Online Pada SMK Garuda Nusantara Bekasi. *Jurnal Ilmiah SINUS*, 17(1), 23-36.

20. Rusdi J. F. et al 2019 ICT Research in Indonesia SciTech Framew.

Google Scholar

21. Hendriana Y. and Hardi R. 2017 Remote control system as serial communications mobile using a microcontroller 2016 International Conference on Information Technology Systems and Innovation, ICITSI 2016 - Proceedings

Google Scholar

22. Klaus F. 2003 RFID handbook Applications, Technology

Google Scholar

23. Saparkhojayev N. 2015 RFID - Based Staff Control System (SCS) in Kazakhstan Journal of Physics: Conference Series

Google Scholar

24. Singh H. 2017 Students Attendance Management System Using Rfid and Gsm Module 5th Int. Conf. Adv. Eng. Technol.

Google Scholar

25. Zhang X., Liu D. and Hao L. 2012 An attendance system design based on wireless RFID Advanced Materials Research

Google Scholar

26. Da Xu L., He W. and Li S. 2014 Internet of things in industries: A survey IEEE Transactions on Industrial Informatics

Google Scholar

27. Fiddes L. K., Chang J. and Yan N. 2014 Electrochemical detection of biogenic amines during food spoilage using an integrated sensing RFID tag Sensors Actuators, B Chem.

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