Development Report
PHYSICS II COURSEWORK PERFORMANCE ANALYZER Dashboard
By Shafiq R

Abstract

This report presents the development of the *PHYSICS II COURSEWORK PERFORMANCE ANALYZER*, a dashboard created to facilitate the monitoring and analysis of student performance in the SP025 (Physics II) course at Kolej Matrikulasi Sarawak (KMSw). Built using Google Sheets as the data source and Looker Studio as the visualization tool, the dashboard provides a centralized, real-time view of individual student coursework marks across multiple assessment components. It supports lecturers and academic coordinators in tracking UPS tests, practical assessments, and assignment scores efficiently. With features such as MIS-based student lookup, color-coded sections, and live data updates, the dashboard aims to reduce manual workload, enhance feedback delivery, and promote data-informed academic support. This document outlines the design objectives, platform tools, implementation steps, key features, and potential future enhancements of the system.

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Introduction

The *PHYSICS II COURSEWORK PERFORMANCE ANALYZER* is a customized dashboard developed to support the evaluation and visualization of student coursework marks for the SP025 (Physics II) course at Kolej Matrikulasi Sarawak (KMSw). The dashboard was created in response to the need for a centralized, accurate, and efficient system for managing coursework data. It provides lecturers and academic coordinators with a simplified method of accessing, reviewing, and interpreting students' progress across various assessment components. Developed using Google Sheets and Looker Studio, the system is designed to be accessible, flexible, and compatible with real-time data updates.

Objectives

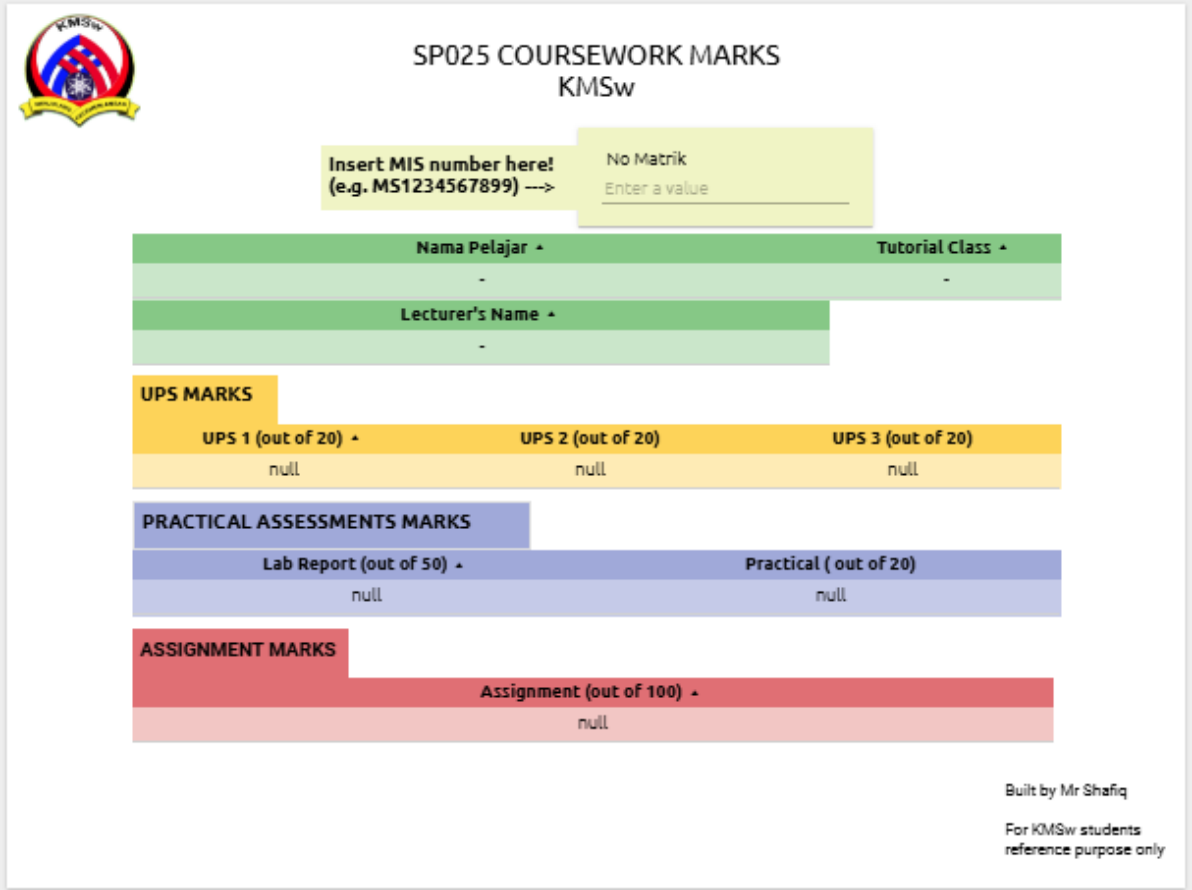
The main objective of this project is to digitalize the management of coursework performance records. It seeks to reduce reliance on manual tracking methods by offering a centralized digital solution that automatically retrieves and displays assessment data. The dashboard also aims to improve the speed and accuracy of feedback given to students by allowing users to instantly view individual performance through a MIS number lookup. Furthermore, it supports academic planning by providing structured performance insights for each coursework component.

Tools and Platforms

The dashboard integrates two key tools: Google Sheets and Looker Studio. Google Sheets serves as the primary data source, where all student assessment records are entered and maintained. It offers easy data entry, cloud-based access, and compatibility with data connectors. Looker Studio, formerly known as Data Studio, functions as the visualization layer. It enables the creation of interactive and user-friendly dashboards that pull live data directly from the Google Sheet. This integration ensures that any updates in the sheet are immediately reflected in the dashboard, maintaining data consistency and accuracy.

Dashboard Features

The dashboard interface is structured for ease of use, with a clean layout and color-coded sections to differentiate assessment categories.



At the top of the interface, there is a field where users can enter a student's MIS number. Once entered, the dashboard retrieves and displays the student's name, tutorial class, and lecturer's name. Below this, the coursework marks are divided into three main sections: UPS marks, practical assessments, and assignment marks. The UPS marks section includes UPS 1, UPS 2, and UPS 3, each graded out of 20 marks and highlighted in orange. The practical assessments section, shaded in blue, includes two components: the lab report (out of 50) and the practical test (out of 20). Finally, the assignment section, presented in red, displays the student's assignment mark out of 100. Each section is clearly labeled and designed for quick reference.

Implementation Process

The development process began with structuring the coursework data in Google Sheets. Each student was assigned a unique MIS number, and their marks were entered under clearly labeled columns corresponding to the relevant assessment components. The Google Sheet was then

connected to Looker Studio using a live connector. Calculated fields and filters were configured in Looker Studio to ensure that data retrieval was accurate and dynamic. A MIS number filter was implemented to allow individualized performance lookup. The dashboard layout was carefully designed to align with the logical structure of the coursework, and colors were applied to visually distinguish the different assessment categories. Dummy data was used during testing to ensure functionality and accuracy before deploying the dashboard for academic use.

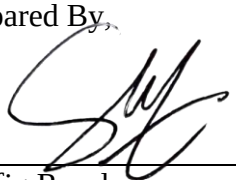
Future Enhancements

To further improve the functionality and value of the dashboard, several enhancements are planned. These include the addition of automated total score and grade calculations, graphical representations of class-wide performance (such as averages and distributions), and the ability to export individual reports to PDF. Another potential improvement is the integration of basic access control features or verification methods to ensure data privacy. These future additions would expand the dashboard's role from a performance tracker to a full-featured academic monitoring tool.

Conclusion

In conclusion, the *PHYSICS II COURSEWORK PERFORMANCE ANALYZER* dashboard offers a modern, efficient, and accessible solution for managing student coursework marks at Kolej Matrikulasi Sarawak. By leveraging the capabilities of Google Sheets and Looker Studio, the dashboard enhances transparency, reduces manual workload, and provides meaningful academic insights. Its structured design and interactive features make it a valuable tool for both lecturers and students, laying the foundation for more effective academic engagement and feedback.

Prepared By,



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Student Feedback*

*Collected after the dashboard was released

Introduction

To evaluate student perceptions of the PHYSICS II COURSEWORK PERFORMANCE ANALYZER dashboard, a quantitative survey approach was adopted. A structured questionnaire consisting of 15 items was developed, encompassing five key domains: Perceived Usefulness, Usability & Design, Feedback & Academic Support, Transparency & Trust, and Future Expectations. Each item was rated using a 6-point Likert scale, ranging from 1 (Strongly Disagree) to 6 (Strongly Agree), intentionally excluding a neutral midpoint to encourage more definitive responses.

The survey was conducted online via Google Forms and distributed to students enrolled in the SP025 (Physics II) course at Kolej Matrikulasi Sarawak (KMSw). All participants had prior access to the dashboard. Participation was voluntary and anonymous, and students were given one week to complete the survey.

A total of 20 valid responses were collected. The data were compiled using Google Sheets and analyzed using descriptive statistics. Mean scores for each domain were calculated to evaluate general trends, while item-level responses provided deeper insight into specific strengths and areas for improvement in the dashboard's design and functionality.

Data Collected

Domain	No.	Item	Mean Score (Out of 6)
A. Perceived Usefulness	**1**	The dashboard helps me understand my overall performance in Physics II.	5.30
	2	The dashboard motivates me to improve my coursework results.	5.55
	3	I find the dashboard useful in identifying my weak areas.	5.55
B. Usability & Design	**4**	The dashboard layout is easy to navigate.	5.50
	5	Color coding in the dashboard helps me quickly interpret different assessment types.	5.50
	6	It is easy to look up my coursework marks using the MIS number.	5.70
C. Feedback & Academic	**7**	The dashboard provides timely feedback on my coursework.	5.30
	8	The system allows me to have more meaningful discussions with my lecturer about my progress.	5.30
	9	I feel more informed about how my marks are calculated.	5.70
D. Transparency & Trust	**10**	I trust that the marks shown on the dashboard are accurate and up to date.	5.45
	11	The dashboard makes the assessment process more transparent.	5.35
	12	I feel confident that my data is managed securely through the dashboard.	5.30
E. Future Expectations	**13**	I hope the dashboard will be used for other subjects as well.	5.35
	14	Having a feature to download my report would be helpful.	5.30

Note: Data Collected from 20 respondents

The student feedback indicates a generally positive reception of the PHYSICS II COURSEWORK PERFORMANCE ANALYZER Dashboard, with most items receiving mean scores above 5.30 out of 6.

Perceived Usefulness

Students perceive the dashboard as highly useful. The dashboard is seen as helpful in understanding overall performance in Physics II (mean score: 5.30) and is particularly motivating for improving coursework results (mean score: 5.55). Students also found it useful in identifying their weak areas (mean score: 5.55). This aligns with the dashboard's objective to provide insights into individual performance and support academic planning.

Usability & Design

The dashboard's design and usability are well-regarded. Students found the layout easy to navigate (mean score: 5.50), and the color-coded sections were effective in helping them quickly interpret different assessment types (mean score: 5.50). The ease of looking up coursework marks using the MIS number was also highly appreciated (mean score: 5.70), which is a core feature aimed at enhancing feedback delivery and reducing manual workload.

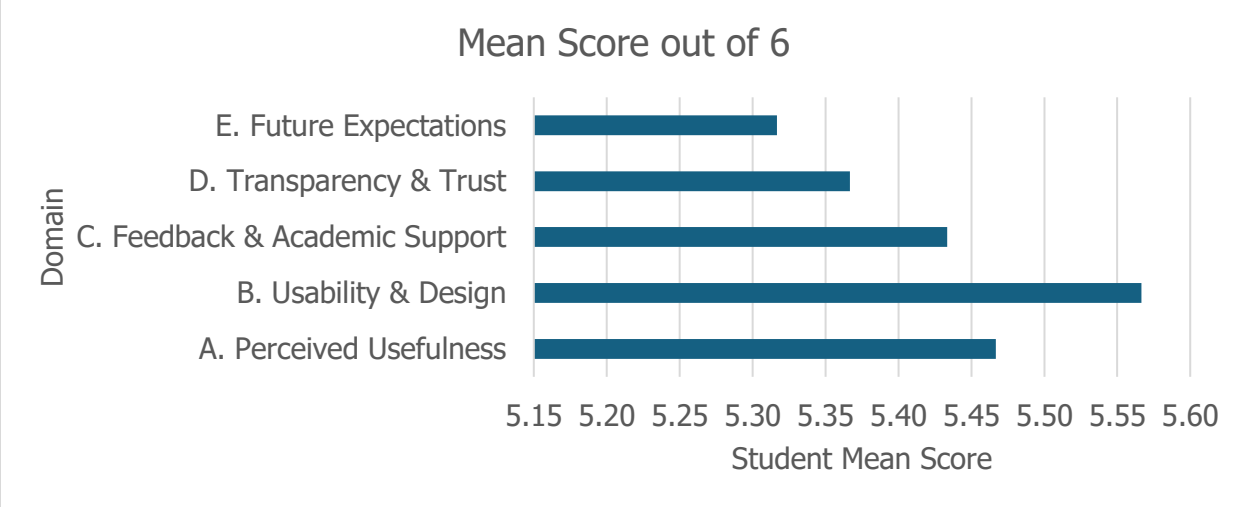
Feedback & Academic

The dashboard is effective in providing timely feedback (mean score: 5.30) and informing students about how their marks are calculated (mean score: 5.70). Students also felt it facilitated more meaningful discussions with their lecturers about their progress (mean score: 5.30). This demonstrates the dashboard's success in improving feedback speed and accuracy, and supporting academic engagement.

Transparency

Transparency and data security are important to students. They generally trust the accuracy and up-to-dateness of the marks shown (mean score: 5.45) and believe the dashboard makes the assessment process more transparent (mean score: 5.35). While the score for feeling confident

about data security is slightly lower (mean score: 5.30) compared to other categories, it still indicates a relatively positive perception. The real-time updates from Google Sheets to Looker Studio contribute to this perceived accuracy and transparency.



Future Expectations

Students have clear expectations for future enhancements. There is a strong desire for the dashboard to be used for other subjects as well (mean score: 5.35). Additionally, having a feature to download individual reports would be highly beneficial (mean score: 5.30). These suggestions align with the planned future enhancements, such as expanding the dashboard's role beyond a performance tracker to a full-featured academic monitoring tool.

Future Recommendations

Based on the student feedback and the stated future enhancements of the dashboard, the following recommendations are put forth:

1) Implement Report Export Functionality

   Prioritize the development and integration of a feature that allows students to download individual performance reports in PDF format. This was explicitly requested by students and would significantly enhance the dashboard's utility for personal record-keeping and sharing.

2) Explore Expansion to Other Subjects

   Given the strong student interest , investigate the feasibility of adapting and deploying this dashboard model for other subjects within Kolej Matrikulasi Sarawak (KMSw). This would require standardizing data collection and adapting the dashboard template for different course structures.

3) Enhance Data Privacy and Security Communication

   While generally confident, the slightly lower score regarding data security suggests an opportunity to further reassure students. Implement basic access control features or verification methods as planned. Additionally, clearly communicate the security measures in place to build even greater trust.

4) Integrate Automated Calculations and Visualizations

   Proceed with the planned enhancements of automated total score and grade calculations , as well as graphical representations of class-wide performance (averages, distributions). These features would provide richer insights for both students and academic staff, further reducing manual workload and promoting data-informed decision-making.

By addressing these recommendations, the "PHYSICS II COURSEWORK PERFORMANCE ANALYZER Dashboard" can further solidify its role as an indispensable tool for student academic management and support at Kolej Matrikulasi Sarawak.