

Student Engagement in Co-Curricular Activities at UMPSA

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Abstract—The objective of this project is to utilize data visualization techniques to enhance student engagement in co-curricular activities at Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA). Despite the importance of extracurricular participation in students' personal growth and skill development, there is a lack of comprehensive systems for tracking and analyzing student involvement. This research proposes the use of interactive visual dashboards to provide valuable insights into students' participation trends, demographics, and the impact of engagement on leadership and soft skills. By improving accessibility to engagement data, the project aims to foster a culture of active participation, ensuring students acquire vital social and leadership skills while pursuing academic excellence. The goal is to create a visualization tool that empowers administrators, faculty, and students to make informed decisions that drive a more engaged, well-rounded academic experience.

Keywords—student engagement, co-curricular activities, data visualization, dashboard, UMPSA, leadership, soft skills.

I. PROBLEM STATEMENT

At UMPSA, many students need more involvement in co-curricular activities, leading to missed opportunities for developing essential leadership skills, social engagement, and other soft skills critical for holistic education [1]. Participation in sports, clubs, and volunteer programs provides students with practical experiences that enhance their teamwork, communication, and problem-solving abilities [2]. However, with active engagement, these opportunities will be utilized. This lack of involvement hinders students from developing skills crucial for success in their academic careers and future professional lives [3].

An effective tracking and engagement system must be addressed, making it difficult for students to identify and take advantage of available opportunities. As a result, students miss out on personal growth experiences, impacting their leadership potential, social connections, and employability. This problem aligns with SDG 4: Quality Education, which emphasizes the importance of inclusive and equitable quality education and promoting lifelong learning opportunities.

Furthermore, low engagement in co-curricular activities may contribute to higher student attrition rates [4], as students who feel disconnected from campus life and development opportunities may be less likely to persist through their studies.

II. TECHNICAL DESCRIPTION OF THE VISUALIZATION TECHNIQUE

The proposed visualization technique will be used to display student participation in various co-curricular activities at UMPSA.

A. Pie Charts

Pie charts are effective for showing the relative proportion of different co-curricular activity types that students engage in, such as sports, clubs, and volunteering. The chart allows stakeholders to quickly identify dominant activities and highlight areas of low student involvement.

B. Bar Chart

Bar charts will be used to compare participation trends across various co-curricular activities over time. They can also display the number of students engaged in different activity categories per academic semester, revealing the shifts in student preferences and participation.

C. Dashboard

The final solution will be an interactive dashboard using Looker Studio, combining all these visual elements. It will allow users to filter data by different parameters such as gender, faculty, or activity type, providing a detailed and customized view of student engagement.

III. TARGETED STAKEHOLDERS

A. UMPSA Students

Students are the primary users of the engagement dashboard, benefiting from clearer visibility into their participation in co-curricular activities. This access helps them make informed decisions on which activities to join, enhancing their personal growth and skill development.

B. Faculty Members

Faculty members can use engagement data to understand better how extracurricular activities complement academic goals. The visualization will help identify students who may need more encouragement to engage and those who might be under-engaged in important activities.

C. UMPSA Administrators

Administrators can use the dashboard to monitor engagement trends across departments and year groups. This information will aid in the strategic allocation of resources, the design of targeted programs, and interventions to boost participation where needed.

D. Co-Curricular Activities Organizers

Organizers of student clubs and activities will have access to participation data, enabling them to tailor programs, recruit students, and allocate resources more effectively, thus fostering a more active and vibrant campus culture.

IV. VALUE PROPOSITION FOR THE TARGETED STAKEHOLDERS

The proposed visualization tool will help improve student participation in co-curricular activities by providing clear and actionable data. For students, it will enable them to track their own involvement and understand the importance of engaging in such activities for their personal and professional growth. For administrators, the tool offers insights to optimize the planning and execution of co-curricular programs. By visualizing trends, the tool can guide decisions that lead to a more engaged and skilled student body, ultimately enhancing the university's educational outcomes.

V. ILLUSTRATION

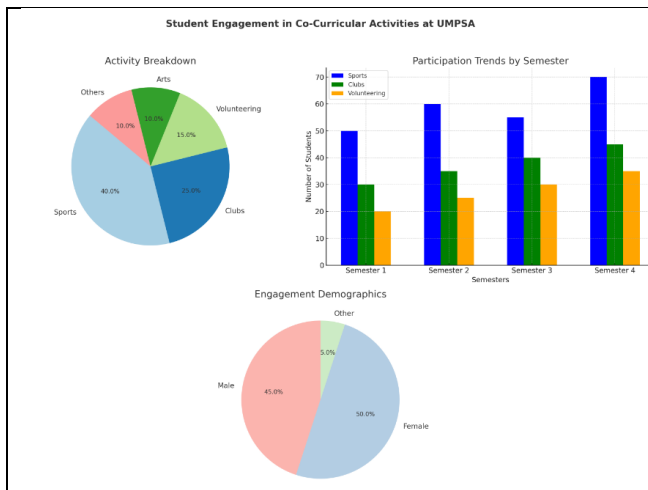


Figure 1: Interactive Dashboard Layout – This will include a combination of pie charts and bar charts, visually displaying participation trends, activity breakdowns, and engagement demographics.

VI. REQUIREMENTS OF TECHNICAL

The project will require data from co-curricular records, including details on student participation in various activities. This data will be processed using Microsoft Excel for initial cleaning and manipulation before being integrated into Google Looker Studio for visualization. Access to existing student engagement databases will be necessary to gather relevant participation data across different co-curricular programs at UMPSA.

For the software tools, the project will use Looker Studio, a free tool that allows for the creation of interactive and visually rich dashboards. Google Sheets will also be utilized to organize and prepare data before uploading it to Looker Studio. Additionally, Microsoft Excel will be used for data analysis and preparation, making it easier to handle large datasets before visualizing them in the dashboard. All of these tools are free and accessible, ensuring a cost-effective solution for the project.

VII. TOOLS

Google Looker Studio is an ideal tool for this project due to its ability to integrate with multiple data sources and its flexibility in creating visually rich, interactive dashboards. It allows for real-time updates and easy customization, making it accessible for all stakeholders. Additionally, Looker Studio is free, which makes it a cost-effective solution.

VIII. TIME LINES

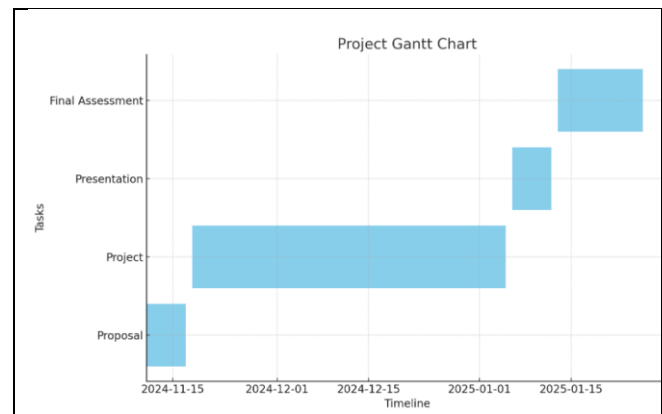


Figure 2: Gantt Chart of this project timelines.

IX. REFERENCES

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