

# Student Engagement Analysis & Low-Engagement Warning System

Yin Tang

Student Affairs Office

Supported by LM

## 1. Background

The original process for analyzing student engagement was hampered by two major bottlenecks, severely undermining the timeliness and effectiveness of early warning interventions:

- **Cumbersome and Inefficient Process:** We relied on an outdated system, Ant\_X, to export raw engagement data. On a weekly basis, analysts had to perform extensive manual calculations, filtering, and comparisons to identify students at risk. The final list then had to be manually emailed to the respective Student Affairs Administrators (DAs). This entire workflow was time-consuming, labor-intensive, and prone to human error.
- **Fragile System with High Maintenance Costs:** The engagement dashboard within Ant\_X was developed by an early vendor and

suffered from an outdated architecture. It was extremely sensitive to any changes in upstream data sources, frequently resulting in errors or data display failures. The high maintenance overhead and constant need for bug fixes led to a poor user experience and low operational efficiency.

## 2. Solutions

To resolve these issues, we designed and implemented a three-tiered automated early warning solution: Data Middle Platform + BI + No-Code Platform.

- **Data Middle Platform: Data Fusion & Intelligent Processing**

We leveraged the data middle platform to integrate and process raw engagement data from various source systems. A key innovation was the deep processing of this data: we intelligently categorized student activity timestamps into “Abnormal Hours” (e.g., 1 AM - 5 AM) and “Normal Hours,” and counted each student’s activity frequency within these periods. This provided a more insightful data foundation for subsequent risk identification.

- **FineBI: Multi-dimensional Interactive Analysis**

Using the processed data from the middle platform, we built an interactive analysis dashboard on FineBI. Users can:

- 1) Dynamically Filter and Compare: Freely combine dimensions like college, grade, and gender to visually compare engagement trends across different groups over time.
- 2) Self-Service Data Exploration: Utilize features like drill-down and chart-linking for in-depth vertical and horizontal analysis to quickly pinpoint at-risk groups.
- 3) Export Detail Data: Export the activity details of specific student groups during “Normal” and “Abnormal” hours with one click, providing the necessary input for precise early warning.

- No-Code Platform: Automated Early Warning & Targeted Delivery

The detail data exported from FineBI is seamlessly integrated into a no-code platform. Here, we configured automated calculation rules to generate the final list of “low-engagement” students requiring intervention. This list is automatically pushed to each DA’ s personalized “Telescope” dashboard, achieving end-to-end automation from list generation to targeted outreach, completely replacing the traditional email notification method.

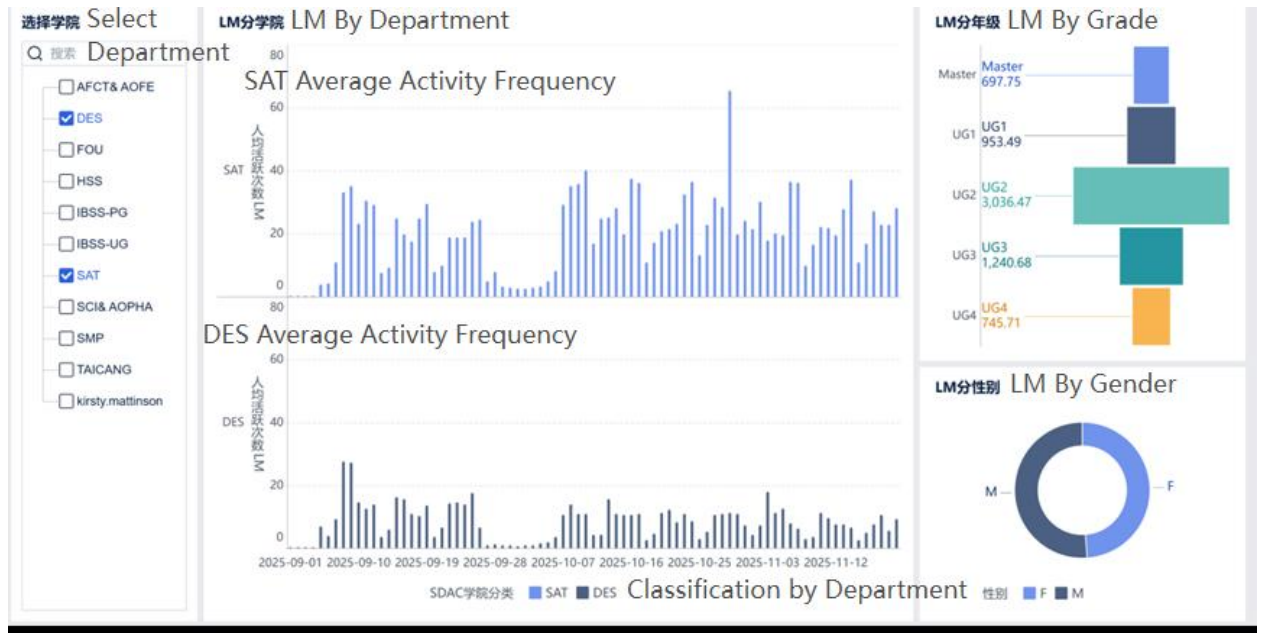


Figure 1. Activity Dashboard

1-5AM异常时段活跃名单 (近2周) **Abnormal Hour Activity List (Past 2 Weeks)**

Student ID	Chinese Name	英文名 English Name	年级 Stage	专业 Programme	异常时段活跃天数 abnormal time active days	异常时段活跃天数占比 abnormal days %	晚归天数(1-5am慧湖通刷卡) Late return days
247	郭	Hao	UG2	Applied Mathematics	5	36%	1
246	宋	Ha	UG2	Applied Mathematics	3	21%	2
26	潘	Pei	UG2	Applied Mathematics	3	21%	2
22	董	Hao	UG4	Applied Mathematics	3	21%	1
21	顾	Zuo	UG4	Applied Mathematics	2	14%	4
246	王	Kun	UG2	Applied Mathematics	2	14%	4
24	张	Jia	UG2	Applied Mathematics	2	14%	3
22	翁	Jing	UG3	Applied Mathematics	1	7%	5
22	林	Hao	UG4	Applied Mathematics	1	7%	3
225	郭	Jing	UG4	Applied Mathematics	1	7%	2
225	束	Bin	UG4	Applied Mathematics	1	7%	2
24	陆	Yi	UG2	Applied Mathematics	1	7%	2
247	葛	Wen	UG2	Applied Mathematics	1	7%	2

20条/页 共 13条

Figure 2. Abnormal Hour Activity List (Past 2 Weeks)

### 3. Outcomes and Benefits

The launch of the new system has brought revolutionary improvements to student affairs management:

- **Efficiency Revolution:** It has completely liberated analysts from tedious manual work.
- **Stability and Reliability:** The new architecture is independent of the fragile legacy system. The dashboard runs stably with near-zero maintenance costs, ensuring business continuity.
- **Timeliness and Accuracy of Warnings:** The analytical model based on “abnormal hours” activity identifies at-risk students earlier and more accurately, buying precious time for DAs to take proactive action.