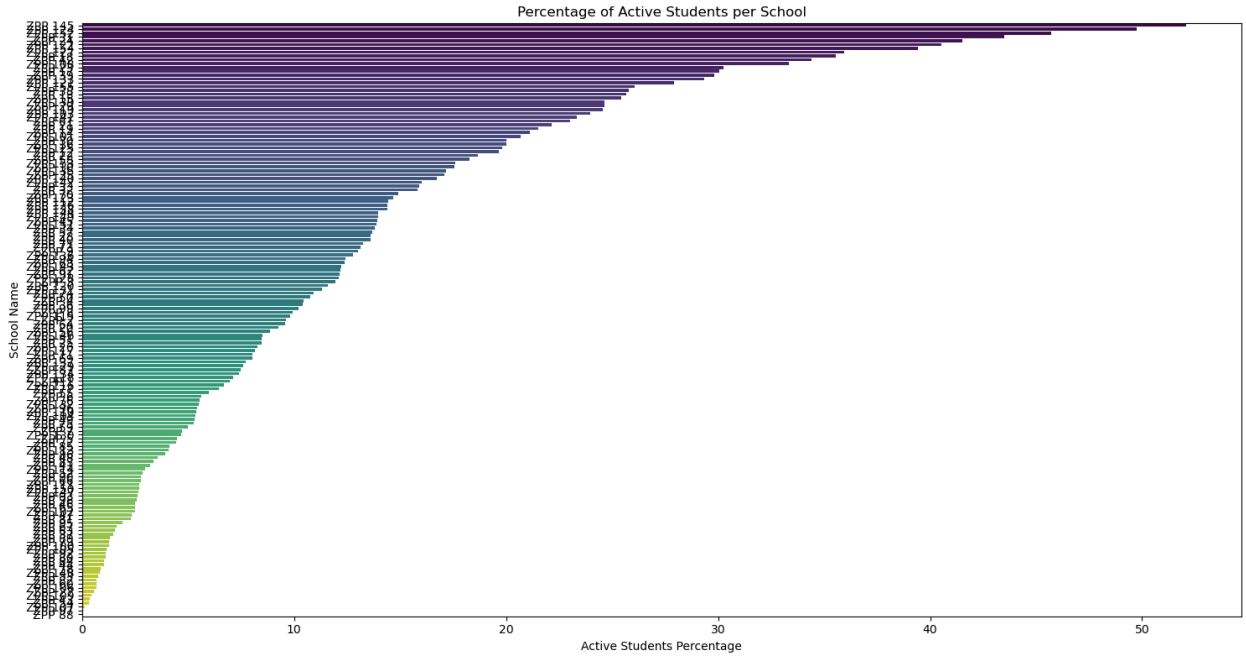
Comprehensive Report on Khan Academy;s Program Implementation and Engagement Analysis on Indian Schools:

Executive Summary

This report presents a comprehensive analysis of the Khan Academy program implementation across 15 districts, covering 155 schools, and reaching 23,583 students in grades 6-8. The analysis identifies key trends, insights, and recommendations to strengthen the program as it enters its second year in April 2024.

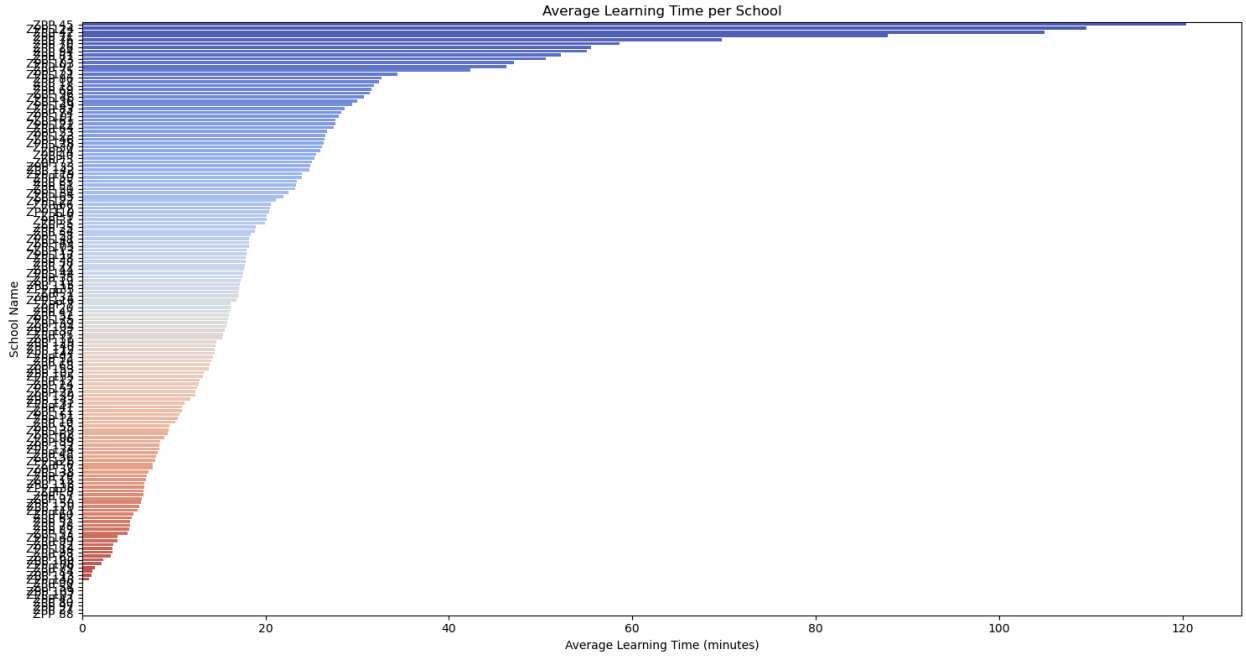
Analysis of Program Reach and Engagement

1. School Level Analysis

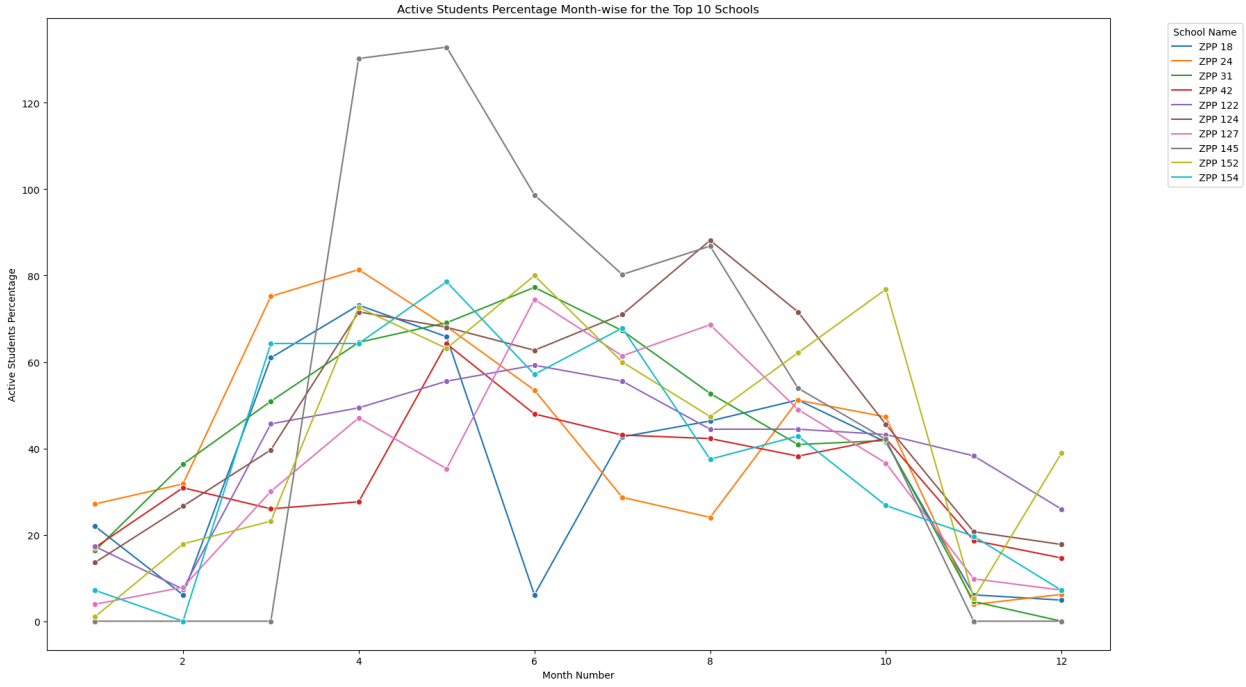


The bar plot above visualizes the percentage of active students for each school. This allows us to see which schools have the highest and lowest engagement relative to their total number of registered students.

The bar plot below visualizes the average learning time per student for each school. This helps identify schools where students are spending the most and the least time on the platform.



The line plot visualizes the Active Students Percentage across different months for the top 10 schools. Each line represents a school, showing how their engagement fluctuates throughout the year. This allows us to identify patterns and trends in student engagement for these top-performing schools.

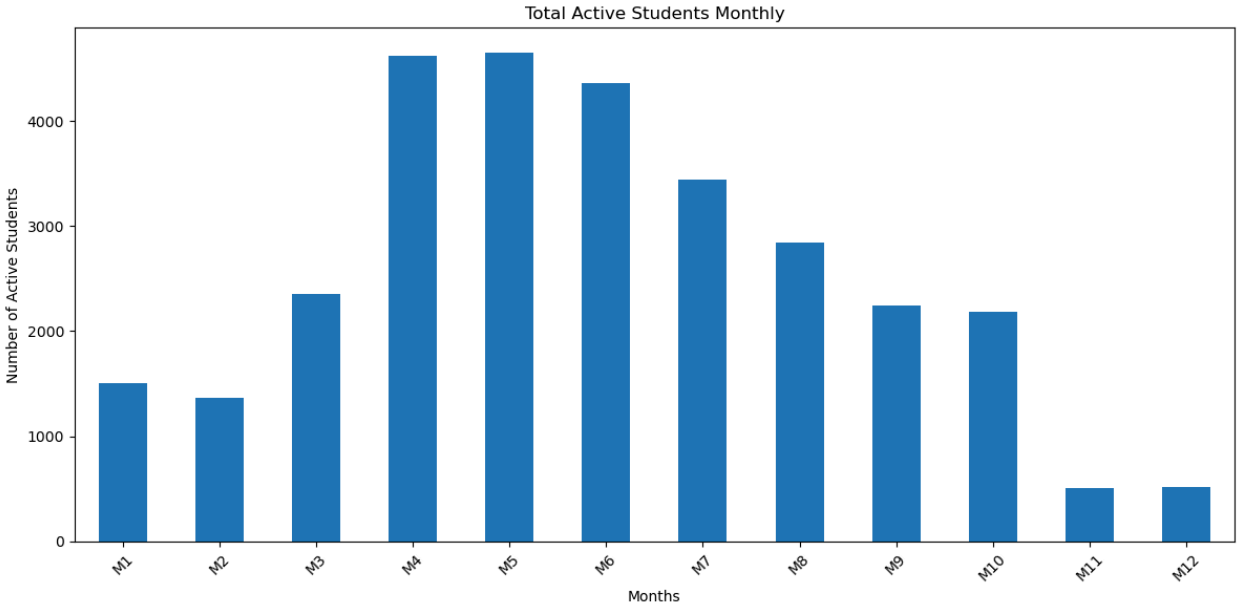


Insight and Inference on Data Discrepancies¶

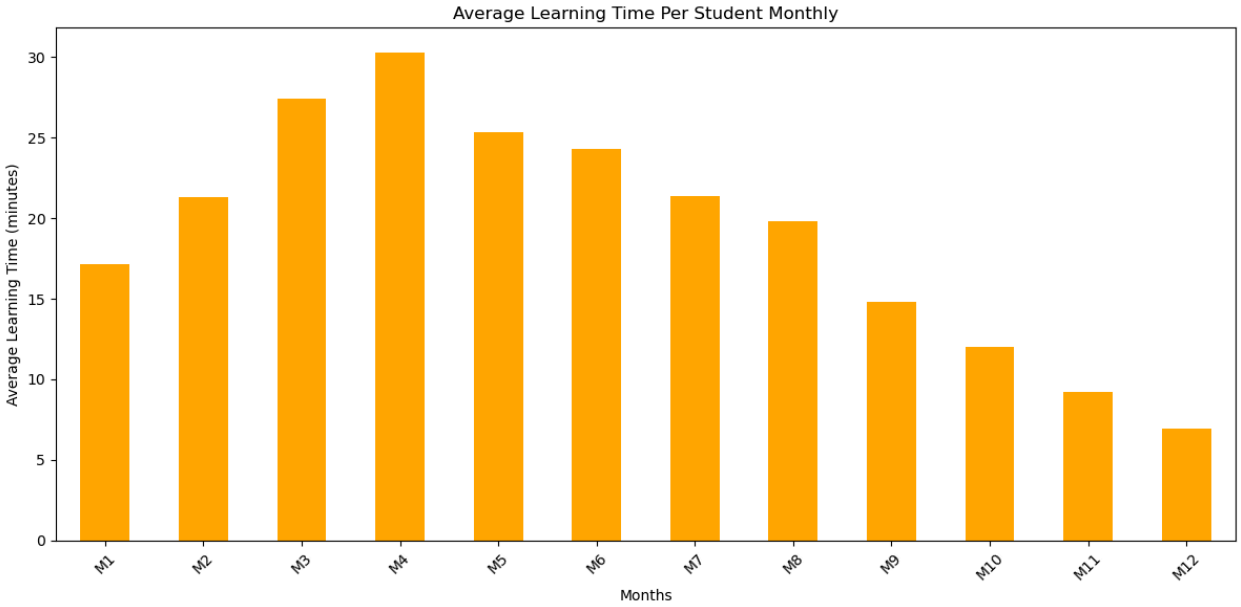
1. Discrepancies in Active Students Percentage:

- **Exceeding 100%**: The line plot highlights some schools with Active Students Percentages exceeding 100%. For example, a school (ZPP 145) with 76 registered students shows more than 99 and 101 active students in certain months.
- **Data Inaccuracies**: This indicates potential data inaccuracies where the number of active students recorded exceeds the number of registered students.

Monthly Active Students and Learning Time

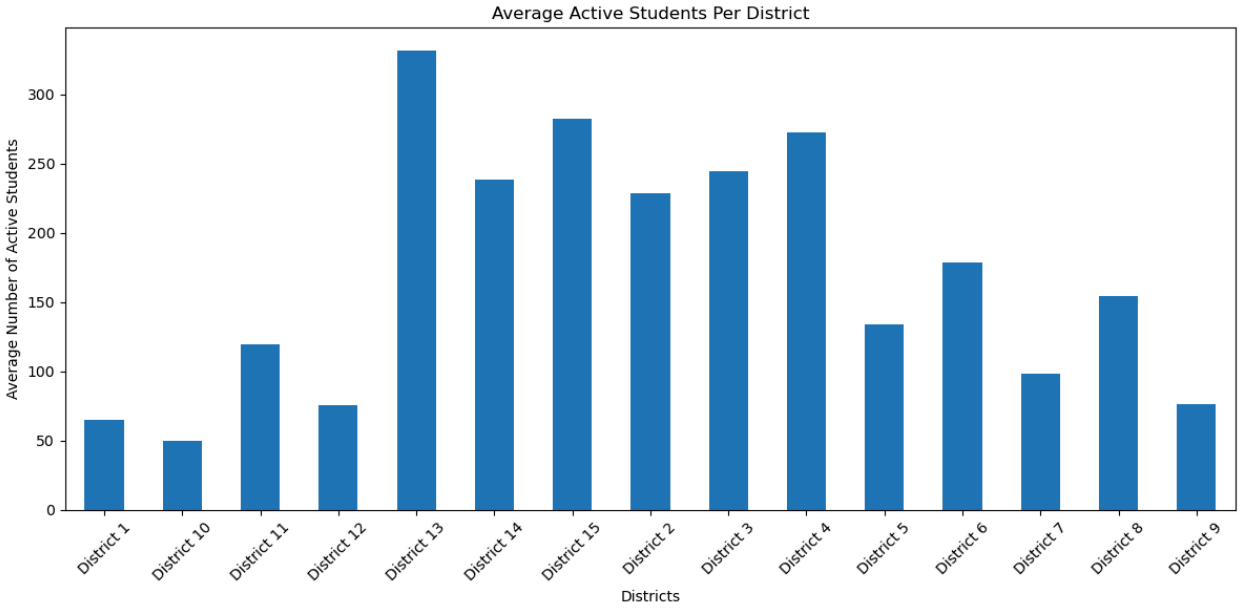


- **Observation**: There is a peak in active students during the fourth and fifth months (April and May), with a noticeable decline towards the end of the year. The average learning time also follows a similar trend, peaking early and gradually declining.
- **Insight**: Engagement levels are highest at the beginning of the academic term and drop towards the end. This suggests a need for strategies to sustain engagement throughout the year.

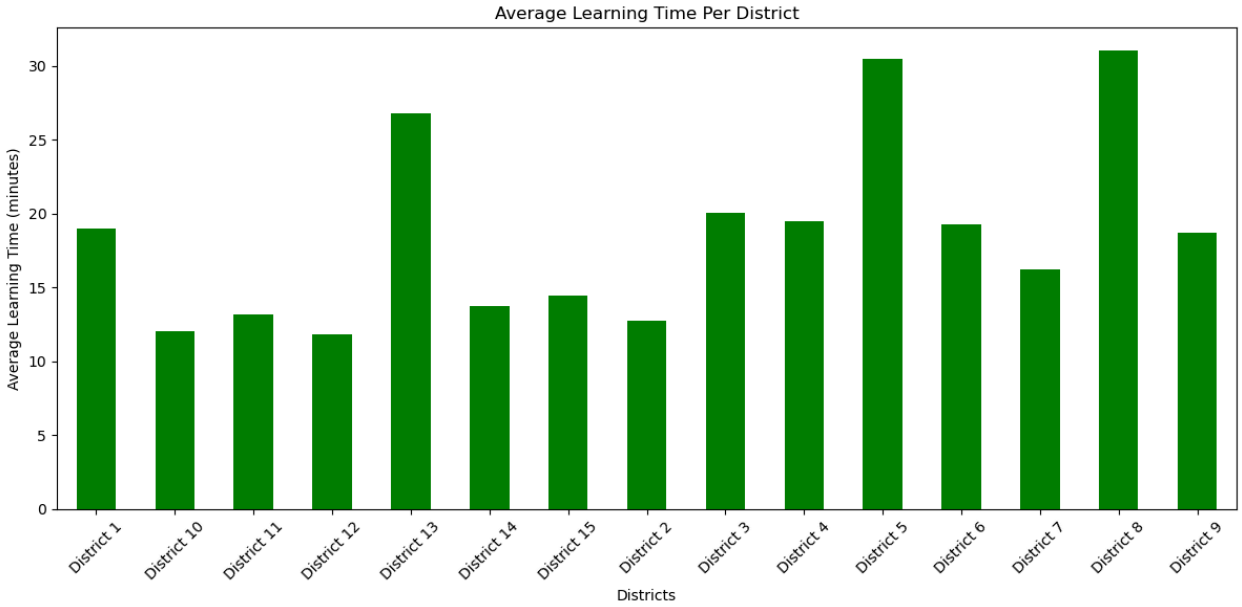


2. District-Level Analysis

Active Students and Learning Time



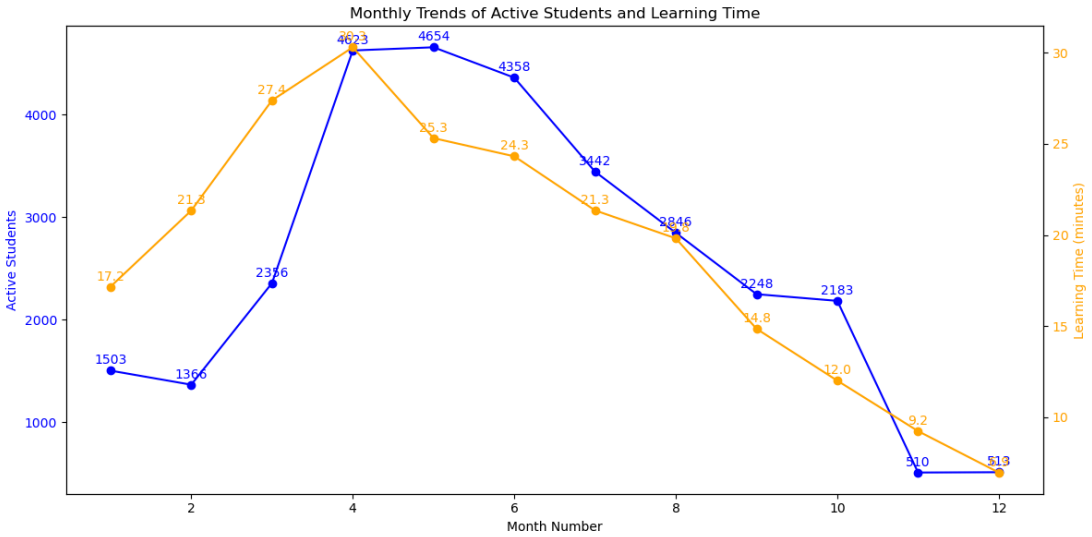
- Observation: Districts 13, 14, and 15 show high engagement, while Districts 9 and 10 exhibit low engagement. Average learning time also varies, with Districts 5 and 8 showing consistently higher engagement.
- Insight: High-performing districts likely have better infrastructure and more effective teacher engagement. Low-performing districts may face challenges such as inadequate infrastructure or socio-economic barriers.



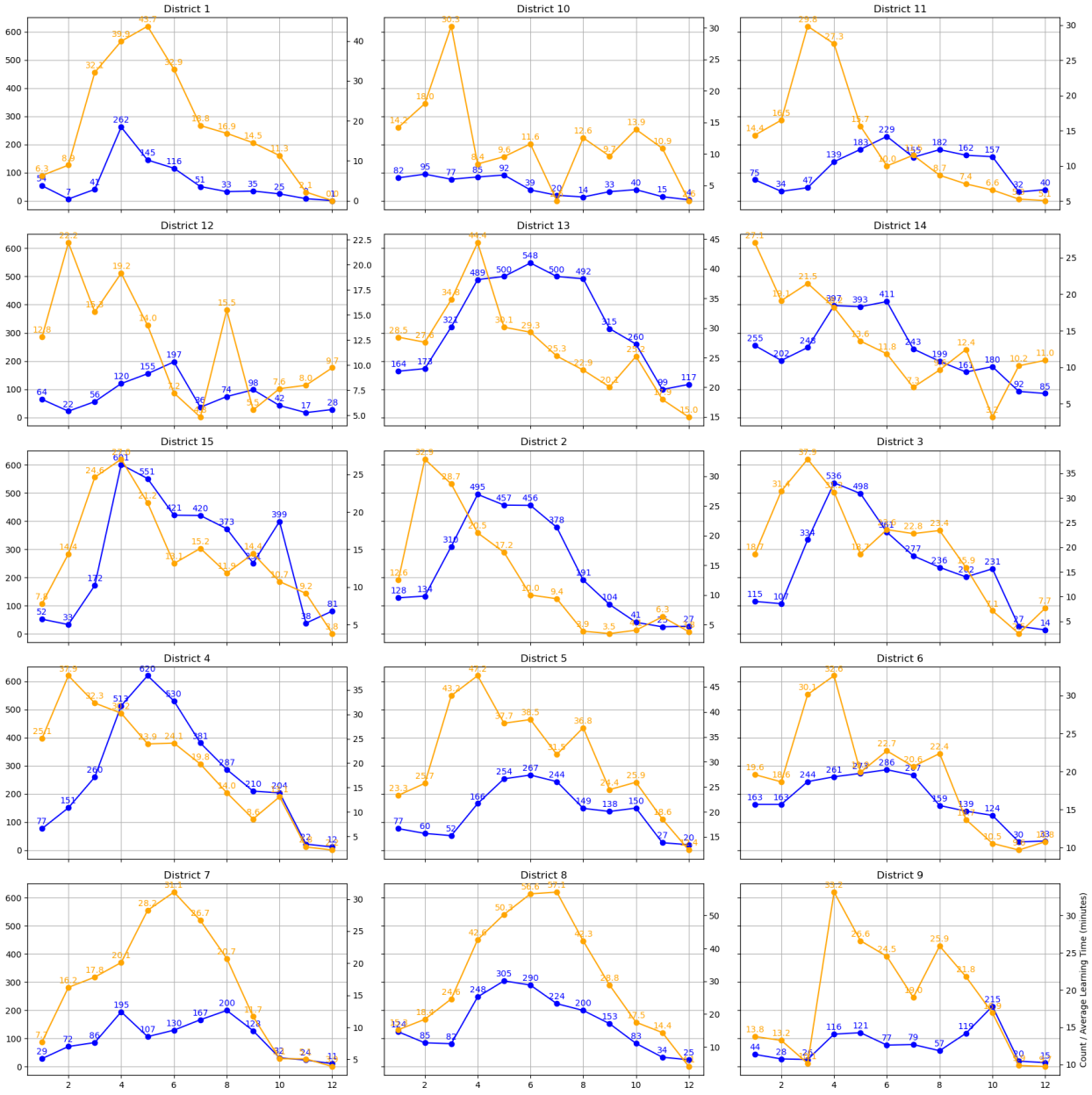
- Observation: Some schools have a high percentage of active students, while others show significantly lower engagement.
- Insight: Schools with higher engagement can serve as models for best practices. Schools with low engagement need targeted interventions to improve performance.

Overall Monthly Trends:

- The total number of active students shows significant peaks in months 4 and 5, indicating strong engagement during these periods.
- The average learning time per student also peaks in the early months but declines over time, suggesting initial high engagement that tapers off.



2. **District-wise Trends**:
    - **District 13** shows consistently high engagement with a relatively stable number of active students and learning time, indicating effective program implementation.
    - **District 14 and 15** also demonstrate high engagement but with more fluctuation, suggesting variability in student participation or external factors affecting engagement.
    - **District 10 and 9** exhibit the lowest engagement, both in terms of active students and learning time, indicating potential challenges in these areas that need addressing.
3. **Seasonal and External Influences**:
    - The peaks in engagement around months 4 and 5 could be related to specific academic schedules, such as the start of a new term or preparatory periods for exams.
    - The decline towards the end of the year may coincide with academic fatigue, holidays, or exam seasons reducing student participation.



1. Overall Engagement Trends:

- Peak Engagement: The highest engagement in terms of active students is observed in the fourth and fifth months (April and May). This could be attributed to the start of a new academic term or a focused intervention period.
- Declining Engagement: There is a noticeable decline in both active students and learning time towards the end of the year. This might be due to academic fatigue, exam periods, or holidays.

2. Learning Time Consistency:

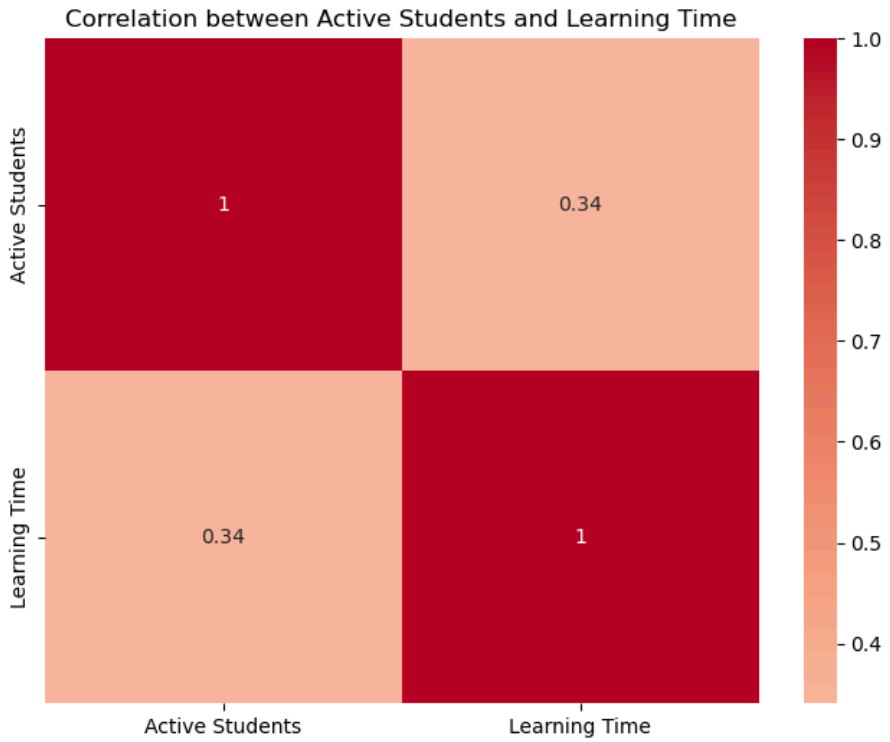
- The average learning time per student starts strong but steadily declines over the months. This indicates initial enthusiasm or compliance with the program, which fades over time. Sustained engagement remains a challenge.

3. District-wise Disparities:

- High Engagement Districts: Districts like 13, 14, and 15 consistently show high engagement in both active students and learning time. These districts likely have better infrastructure, more effective teacher engagement, or other supportive factors.
- Low Engagement Districts: Districts 10 and 9 show significantly lower engagement. These districts might face challenges such as inadequate infrastructure, less effective teacher training, or socio-economic barriers.

4. Seasonal and External Influences:

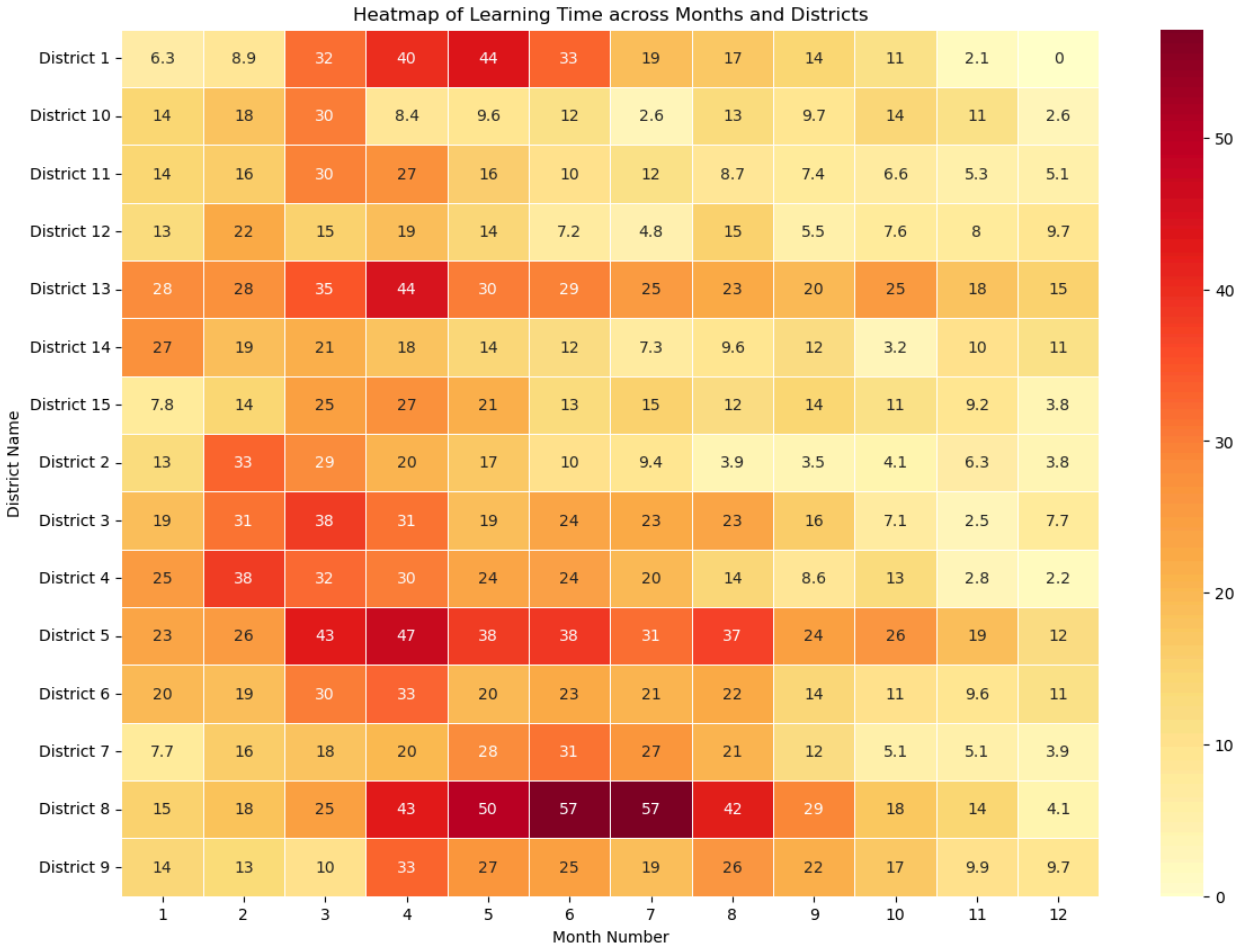
- Peaks in engagement around certain months (April and May) suggest external academic schedules or targeted intervention periods. The decline towards the end of the year aligns with common academic cycles, indicating the need for strategies to maintain engagement during these periods.



1. Correlation Analysis:
Heatmap Analysis: The heatmap shows the correlation between the number of active students and the average learning time.

Weak Correlation: The correlation coefficient is close to zero, indicating a weak linear relationship between the two variables. This suggests that simply increasing the number of active students may not directly lead to longer learning times.

2. Heatmap of Active Students:¶
Visualization: The heatmap visualizes the number of active students across different months and districts.
High Engagement: Districts 13, 14, and 15 consistently show high numbers of active students across most months, reinforcing their strong engagement.
Peak Periods: The concentration of active students in certain months (like April and May) is evident, aligning with earlier observations of peak engagement during these periods.



3. Heatmap of Learning Time:¶

- Visualization: The heatmap visualizes the average learning time across different months and districts.
- Effective Implementation: Districts like 5 and 8 show higher average learning times consistently across months, indicating effective program implementation in these districts.
- Variability: Some districts show significant variability in learning time, suggesting inconsistencies in engagement or external factors affecting usage.

Insights

- **Correlation Insight**: The weak correlation between active students and learning time suggests that interventions aimed at increasing student engagement need to focus on both increasing the number of active students and enhancing the quality of engagement to improve learning times.

- **Engagement Consistency**: Districts with high engagement (13, 14, 15) and high learning times (5, 8) can serve as models for best practices. Understanding the strategies used in these districts can help in replicating their success in lower-performing areas.
- **Seasonal Patterns**: The concentration of active students in specific months highlights the importance of aligning program activities with academic schedules and addressing potential drops in engagement during off-peak periods.

Hypotheses Contributing to Observed Patterns

1. Infrastructure Availability:
   - Hypothesis: Schools with better infrastructure show higher engagement and longer learning times.
   - Rationale: Access to technology and a conducive learning environment support regular student engagement.
2. Teacher Engagement and Training:
   - Hypothesis: Higher teacher engagement and effective training lead to higher student engagement and longer learning times.
   - Rationale: Well-trained and motivated teachers are crucial for integrating digital tools and motivating students.
3. Socio-Economic Factors:
   - Hypothesis: Socio-economic status influences engagement levels on Khan Academy.
   - Rationale: Economic barriers may limit students' access to devices and internet at home.
4. Seasonal and Academic Cycles:
   - Hypothesis: Engagement levels fluctuate with academic cycles and seasonal factors.
   - Rationale: Exam periods and holidays significantly impact student activity.
5. Data Recording and Quality:
   - Hypothesis: Inaccuracies in data recording contribute to anomalies in engagement metrics.
   - Rationale: Ensuring data integrity is fundamental for reliable analysis and insights.

Recommendations for Strengthening Implementation in the Second Year

For Yourself (M&E Analyst):

1. Data Quality Assurance:
   - Implement regular data audits and automated validation to ensure accurate and consistent data recording.
   - Identify and correct any discrepancies, such as active students exceeding registered students.
2. Granular Data Analysis:
   - Conduct detailed school-level analysis to identify specific barriers and success factors.
   - Segment schools and districts based on performance to tailor interventions and support.
3. Feedback Mechanisms:
   - Develop comprehensive reports highlighting key metrics and trends for stakeholders.
   - Establish a feedback loop with schools and teachers to share findings and collaboratively address challenges.

For State Officials:

1. Infrastructure Investment:
   - Prioritize resource allocation to low-performing districts to ensure they have the necessary infrastructure (computers, internet access) to support Khan Academy usage.
   - Foster partnerships with private organizations to secure additional funding and resources for infrastructure improvements.
2. Policy Support:
   - Advocate for the integration of Khan Academy into the regular school curriculum, ensuring consistent use.
   - Implement incentive programs to reward schools and teachers who show significant improvement in engagement and learning outcomes.
3. Addressing Socio-Economic Barriers:
   - Develop programs to provide devices and internet access to students from low-income families.
   - Engage with community organizations to support students' learning needs outside of school.

For Teachers:

1. Enhanced Training and Support:
   - Provide continuous professional development opportunities focusing on effective use of Khan Academy, integrating it with classroom teaching, and tracking student progress.
   - Establish peer learning networks where teachers can share best practices and strategies for increasing student engagement.
2. Student Engagement Strategies:
   - Implement motivational strategies such as gamification, rewards, and recognition to encourage regular use of Khan Academy.
   - Encourage teachers to monitor student progress regularly and provide timely feedback to keep students engaged and on track.
3. Customized Learning Plans:
   - Help teachers create personalized learning plans for students, using Khan Academy's tools to address individual learning gaps.
   - Encourage flexible usage models, such as incorporating Khan Academy in both classroom settings and home assignments.

Conclusion

This comprehensive analysis identifies key trends, insights, and recommendations to strengthen the Khan Academy program as it enters its second year. By focusing on data quality, infrastructure investment, policy support, teacher training, and student engagement strategies, the program can achieve more consistent and sustained usage, ultimately improving learning outcomes for all students.