e-GMAT Review Analysis Report

1. Feature Recommendations

a. Typos and Question Quality in Verbal/Quant Sections

Recommendation: Improve quality of Verbal content with thorough editing and make Quant question content realistic to expected trend of difficulty level across all courses, especially in GMAT Live Prep and Online Focused. But also include higher difficulty level to encourage engagement and learning.

• Supporting Evidence:

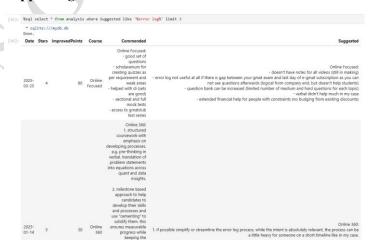


• **Student Benefit:** Eliminating typos will reduce confusion and improve content clarity for learners; realistic Quant content will better simulate test conditions and support effective practice.

b. Improved Error-Tracking and Study Planning Tools

Recommendation: Enhance the error log system and provide more personalized, realistic study plans in Online 360 and Online Focused.

• Supporting Evidence:

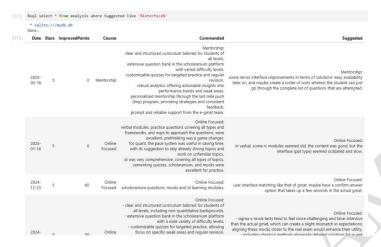


• **Student Benefit:** A better error-tracking tool helps students pinpoint weak areas faster. Realistic plans lead to better time management, focused learner engagement in the platform.

c. UI/UX Enhancements and Interactive Features

Recommendation: Update platform interface and integrate more interactive elements to enhance engagement across all the courses.

• Supporting Evidence:

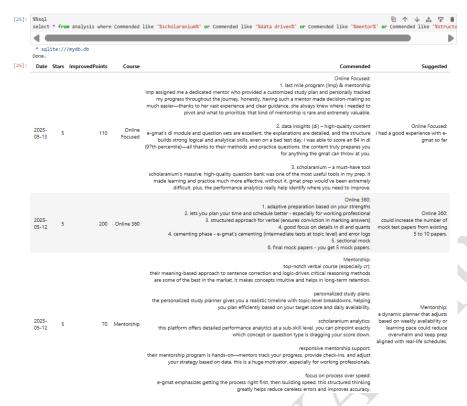


• **Student Benefit:** A modern, engaging UI supports better usability and encourages longer study sessions. Interactive learning promotes retention and deeper understanding for visual and kinaesthetic learners.

2. Strengths Analysis

Top Praised Features

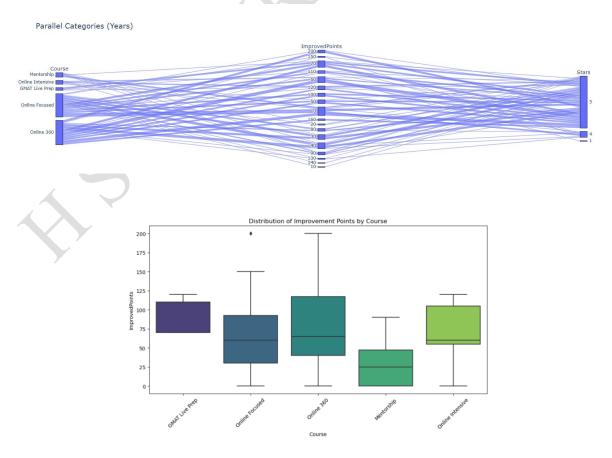
- **Scholaranium** Advanced practice tool praised for data-driven feedback and analytics (7 mentions).
- **Data-Driven Approach** Widely appreciated for actionable insights (6 mentions).
- Structured Learning Paths Enables logical and progressive study flow (5 mentions).
- Mentorship Support & Personalized Plans High value in student motivation and targeted help (9 combined mentions).
- Adaptive Learning Model Praised for dynamically adjusting difficulty (3 mentions).



Popular Courses

Online 360 – 7 mentions, **Online Focused** – 6 mentions, and **GMAT Live Prep** – 4 mentions.

The following charts shows how each of these courses have contributed in boosting the learner's scores which resulted in the above commendations.



Trends (2024–2025)

- Many users highlighted significant score improvements, particularly in verbal reasoning.
- In the first five months of 2025 lots of Online 360 learners have showed improvement by increased ~75-80 points.

Evolution Over 4 Years

Due to data constraints (110 reviews from Aug 2024–May 2025), long-term evolution was not covered from historical data. To address this, a plan to web scrape historical e-GMAT reviews from forums such as GMAT Club can be consideration.

3. Technical Implementation

Approach: The goal was to extract meaningful insights—both qualitative and quantitative—from raw user reviews. The following steps structured the implementation:

a. Understanding the Data

- Initial data exploration helped identify key columns: ReviewBody, Stars, ImprovedPoints, Course name, and Date.
- Verified coverage of structured and unstructured reviews to plan segmentation strategies.

b. Data Cleaning & Formatting

- Standardized Stars as numerical values.
- Normalized course names for consistency.
- Parsed and split review dates into Year and Month for temporal analysis.

c. Review Segmentation

- Segmenting reviews into four key categories using SpaCy small model (NLP over regex as the latter couldn't capture sentiments and unstructured reviews effectively):
 - Strengths
 - Improvements
 - Personal Experience
 - Tips
- For 91% of structured reviews, headers were used to directly extract segments.
- For the remaining, sentence-level chunking was applied with keyword-based pattern matching to identify segment type.

d. Praise & Recommendation Extraction

- Extracted two main fields: Commended (praises) and Suggested (improvements).
- Used **SpaCy** large model for reasoning and context combining for unstructured reviews.
- Included course taken by the user for corresponding review for better classification.

e. Backend & LLM Integration

• Developed a **Flask** backend to serve API endpoints.

- Integrated **LLaMA 3.3 8B Instruct** (via OpenRouter) to summarize:
 - Top strengths and praised features
 - Suggested improvements and feature requests
- LLaMA was selected for its cost-efficiency and strong long-text reasoning ability. GPT-4/Claude 3 were also evaluated.

f. UI for Insight Consumption

• Built a **React** (**Vite**) frontend to display LLM outputs and key summary insights.

g. Data Visualization with Dash

- Created a Dash dashboard to visualize:
 - o Pie chart: Star ratings, Improved points and course distribution
 - o Parallel categories chart: Relationship between Stars, Course, and Improved Points

h. SQLite Database for Review Storage

- Used SQLite to persist structured review data and efficiently query:
 - o Course-specific praise/improvement counts
 - Date-based sentiment trends
 - o Review excerpts for feature justification

Major Challenges and Solutions:

- Unstructured reviews: Regex failed to cover all cases. Switched to NLP for contextual segmentation.
- Scalability vs. Cost: LLMs avoided for raw review segmentation to save cost and to retain raw review context. Used it only for higher-order insight generation.
- **Reasoning vs. Cost:** Using LLMs like GPT-4, Claude-3-Sonnet, or Claude-3-Opus for lengthy context's insight generation is expensive and they are known for their technically accuracy than reasoning ability so llama-3.3-8b-instruct was chosen for cost effective and better reasoning.
- Redundant LLM Calls on Static Data: Multiple LLM calls were being made even when no
 change occurred in the reviews source dataset, resulting in unnecessary latency and cost.
 Implemented local caching mechanism so that LLM insight generation is triggered only when
 the source CSV is modified. Otherwise, previously stored outputs are reused from local storage.
- **Historical comparison limitation:** Current data spans less than 12 months. Plan to incorporate external review scraping to address this.

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