# A Primary Data-Based Study of Improving Academic Performance and Business Enhancement in Small-Scale Educational Services

**A Proposal report for the BDM capstone Project**

Submitted by

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# Content

## Declaration Statement

I am working on a Project Title “A Primary Data-Based Study of Improving Academic Performance and Business Enhancement in Small-Scale Educational Services”. I extend my appreciation to **Meghna Tutorials** for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the information of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

Signature of Candidate

Name: Nirmit Desai

Date: 12/06/2025

# 1) Executive Summary

Meghna Tutorials is a small, community-focused educational service operating in Hiranandani Estate, Thane specializing in academic support for students from grades 4 to 10. The business, led by Mrs. Meghna Desai, has grown steadily since 2015 by providing personalized tutoring in core subjects.

Recently, Meghna Tutorials has faced challenges with student performance consistency, rising dropout rates, and the need to offer more value to both students and parents. Key issues include identifying at-risk students early, understanding the true impact of remedial classes, and providing actionable feedback to families. These challenges not only affect student outcomes but also limit the center's growth and competitive edge.

To address these issues, the project will leverage primary academic data like test scores, attendance, feedback, and fee structure to conduct in-depth analysis using Python and modern business analytics techniques. Approaches such root cause analysis and data visualization will be used to:

- Identify at-risk students and the factors contributing to their struggles
- Evaluate the effectiveness of remedial interventions
- Generate customized, professional report cards for each student
- Design and price summer remedial programs for at-risk students
- Offer performance-based incentives to motivate high achievers

The expected outcome is a data-driven framework that improves student retention and performance, enhances parent engagement, and unlocks new revenue streams for the business. By providing transparent, actionable insights and innovative academic offerings, Meghna Tutorials will strengthen its reputation and attract more enrollments, ensuring sustainable growth in a competitive market.

# 2) Oragnisation Background

Meghna Tutorials was started in the year 2015 by Mrs. Meghna Desai with only three students of Grade IV. Mrs. Desai had very good support from her husband. She started taking classes at home to meet the family expenses. Her interest in teaching dated back to the 1990s, the time of her college days, when she was not married and used to take private tuition of her cousins and children from around her house to finance her family. Though she had her own studies in the Gujarati medium, she wanted to teach ICSE students and made that desire a reality years down the line. With incessant effort, word-of-mouth, and frequent promotion through WhatsApp, Facebook, and local newspaper ads, Meghna Tutorials gradually gained in muscle and popularity. Now, it serves students from Grade IV to X, concentrating particularly on PCMB, Social studies and English. With an extra worker now helping with corrections and test monitoring, the center is a testament to Mrs. Meghna's determination, perseverance, and ongoing passion for teaching.

# 3) Problem Statement

- Analyze the academic situation at Meghna Tutorials to identify students at risk of poor performance or dropout using data-driven methods.
- Develop strategies to prevent future dropouts and improve retention by generating customized individual academic reports for targeted intervention.

- Leverage these insights to enhance business growth, attract new enrollments, and design extra income opportunities such as summer programs for at-risk students based on the current fee structure and academic performance data.

# 4) Background of the Problem

At Meghna Tutorials, we're facing a growing challenge: some students are struggling to keep up, and a few are even dropping out. This isn't just about tough exam; it's about a mix of factors both inside and outside the classroom. Internally, things like irregular attendance, low motivation, and gaps in communication between teachers and students can make it harder for students to stay engaged. Sometimes, teaching methods don't match every student's learning style, and when feedback is limited, students may not know how to improve.
But there are outside pressures too. Family issues, financial worries, or even health problems can distract students and impact their performance. When support systems aren't strong enough, whether it's academic help or just someone to talk to, students can feel left behind. As a result, performance drops, students lose confidence, and some eventually leave the tutorial altogether. The main causes are a lack of personalized support, not catching problems early, and not using data to spot trends.
Beyond addressing these challenges, Meghna Tutorials aims to use these insights to grow the business. By understanding student needs better, the tutorial can attract new enrollments and design additional income opportunities, such as summer programs targeted at at-risk students. These programs would be based on the current fee structure and academic performance data, offering targeted support during vacation periods while boosting revenue. To help every student succeed and ensure sustainable growth, a proactive and data-driven approach is essential.

# 5) Problem Solving Approach

To address the academic and business challenges at Meghna Tutorials, a systematic, data-driven problem-solving approach will be implemented, combining proven business analysis techniques and modern data science frameworks.

## 1. Problem Definition & Root Cause Analysis

The first step is to clearly define the problems: inconsistent student performance, undetected at-risk students, unclear impact of remedial classes, and student dropouts. Using root-cause analysis (such as the '6 Thinking Hats'), we will identify underlying factors such as subject-specific weaknesses, attendance issues, or lack of engagement by examining patterns in the dataset.

## 2. Data Exploration & Preparation

All available data such as test scores, attendance, feedback, remedial participation, and fee structure will be cleaned, validated, and structured for analysis using Python. Missing values and anomalies will be addressed to ensure reliable insights.

## 3. Descriptive & Diagnostic Analytics

Descriptive statistics will summarize student performance and engagement at individual, subject, and trimester levels. Correlation analysis and visualizations (heatmaps, trend lines) will reveal relationships, such as whether higher attendance leads to better scores, or if remedial classes are effective. At-risk students will be flagged using set thresholds (e.g., attendance <75%, score <50, feedback ≤5), and their patterns will be compared to known dropouts to predict and prevent future dropouts.

## 4. Predictive & Prescriptive Analytics

Predictive models will be developed to identify students most likely to become at-risk or drop out, based on their academic and engagement trends. These insights will inform targeted interventions, such as personalized remedial classes or parental engagement.

## 5. Solution Design & Business Enhancement

Based on the analysis, subject-wise recommendations will be made to the tutor for instructional improvement. Individualized report cards will be generated for each student, highlighting strengths, weaknesses, and actionable advice, which can be shared during parent-teacher meetings to build trust and attract new enrollments. The business can further grow by offering summer remedial programs for at-risk students (at 10% of annual fees), and incentivizing high performers (≥85% average) with a 5% annual fee discount—both boosting revenue and academic outcomes.


Figure 1

# 6 Expected Timeline

1)Work Breakdown Structure

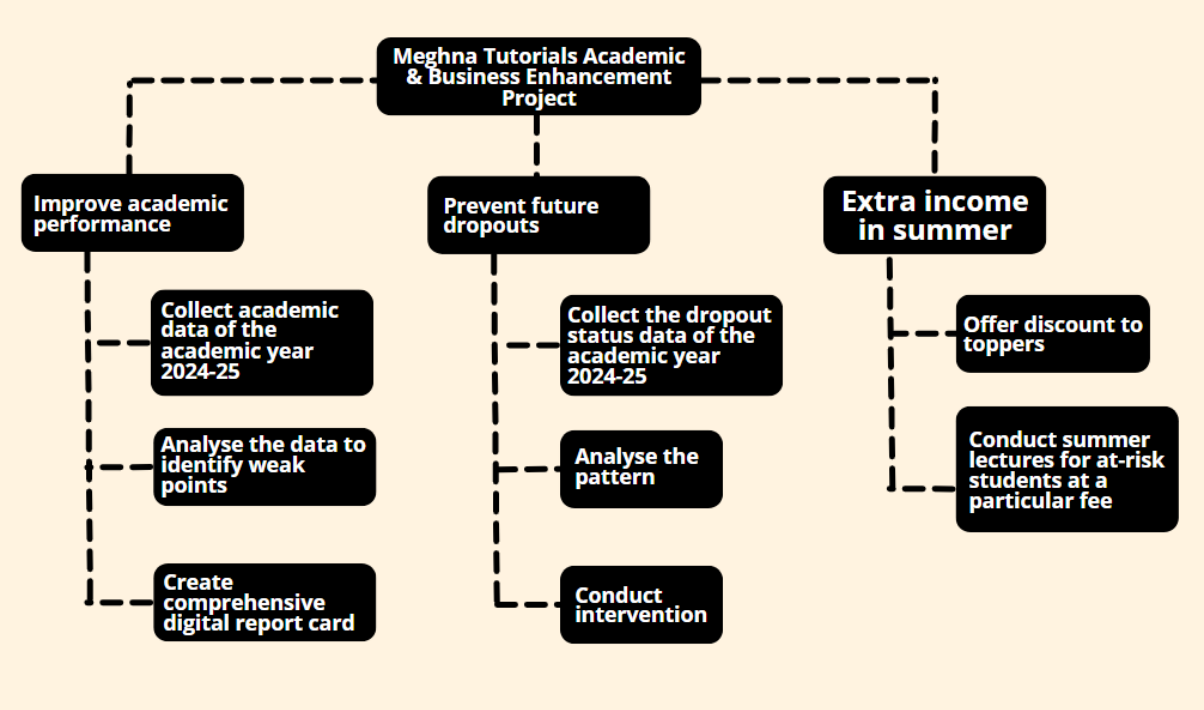


Figure 2

2)Gantt Chart

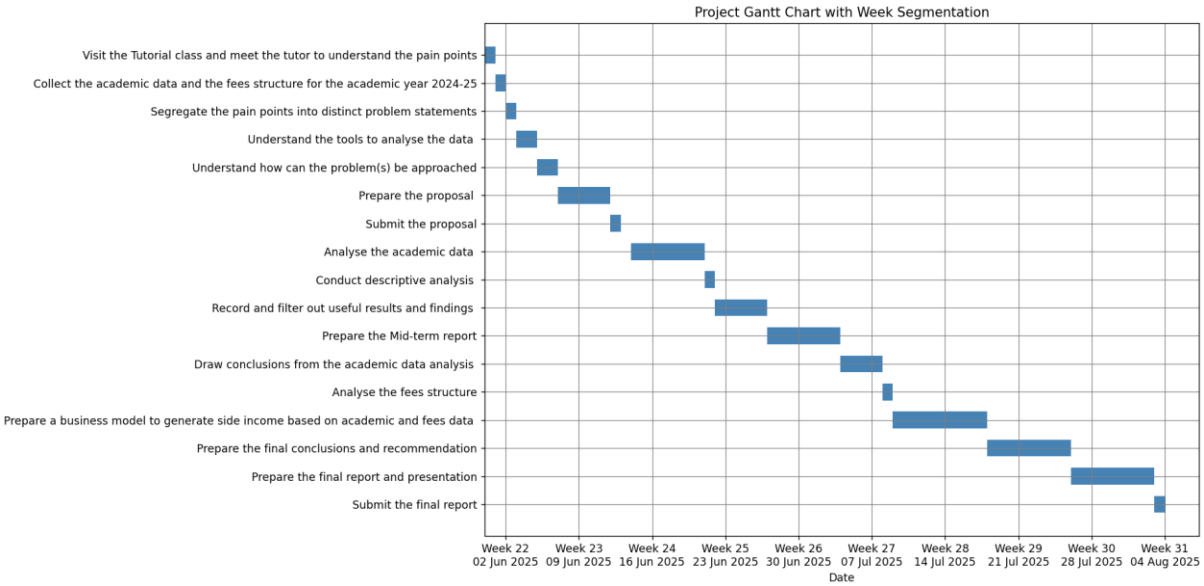


Figure 3

# 7) Expected Outcomes

- **Improved Identification and Support of At-Risk Students**
  By analyzing academic performance, attendance, and feedback data, the project will enable early identification of students who are at risk of poor performance or dropping out. This will allow timely, targeted interventions such as remedial classes and personalized support, improving student retention and success rates.

- **Enhanced Academic Performance Insights**
  The project will provide detailed insights into subject-wise and trimester-wise student performance, helping tutors understand which subjects or topics require more focus. This data-driven approach will guide instructional improvements and enhance overall teaching effectiveness.
- **Customized Individual Reports for Stakeholder Engagement**
  Creating personalized report cards for each student will facilitate transparent communication with parents during meetings. These reports will highlight strengths, weaknesses, and progress, fostering trust and satisfaction, which can attract more enrollments and grow the tutorial's reputation.
- **Data-Driven Business Growth and Revenue Opportunities**
  Leveraging academic and fee data, the project will design new income streams such as summer remedial programs for at-risk students, priced at 10% of annual fees, with incentives like discounts for high performers. These initiatives will boost revenue while supporting student achievement.
- **Strategic Decision-Making and Continuous Improvement**
  The project will establish a framework for ongoing data collection and analysis, enabling Meghna Tutorials to monitor trends, evaluate intervention effectiveness, and adapt strategies dynamically. This foresight will provide a competitive advantage and sustainable growth.