

# **GyanHub - Student Behaviour Analysis and E-Learning Platform for School and Colleges**

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## A. Business Model

### 1. Revenue Streams

Revenue streams are the primary source of income for platform. In Gyan-Hub, these can come from multiple channels:

#### a. Subscription Fees

- **Target Audience:** Schools, universities, and other educational institutions.
- **Pricing Model:**
  - Monthly or yearly subscription model.
  - Tiered pricing based on the number of students or features used (basic, standard, premium).
- **Projected Revenue:**
  - Assume an average fee of ₹2,50,000 per school per year.
  - Target around 10 institutions in Year 1, growing to 100-150 by Year 5.

#### b. Licensing Fees

- **Target Audience:** Other educational software companies or third-party platforms.
- **Revenue Model:** Licensing AI/ML technology to third parties for a one-time or recurring fee.
- **Projected Revenue:**
  - Assume a fee of ₹5,00,000 per year for licensing the platform to third parties, with an increase in partners over the years.

#### c. Customization and Development Services

- **Target Audience:** Schools and institutions looking for custom features.
- **Revenue Model:** Charge for customization of the platform, including AI/ML feature integrations or specific reporting tools.
- **Projected Revenue:**
  - Assume 10% of clients request customization, generating additional revenue of ₹1,00,000 per client.

#### d. Professional Development Services

- **Target Audience:** Teachers and administrators.
- **Revenue Model:** Offer training on AI-powered tools for teachers and administrative staff.
- **Projected Revenue:**
  - Charge for training workshops at around ₹20,000 per session.

### e. Ads and Sponsorships (Optional)

- **Target Audience:** Educational product vendors and related services.
- **Revenue Model:** Ads within the platform, primarily for educational products.
- **Projected Revenue:**
  - Ads can generate an additional ₹10,00,000 annually as the platform scales.

## 2. Cost Structure

Cost structure defines the expenses required to build, maintain, and grow the platform. These include **fixed costs** (overhead) and **variable costs** (costs that scale with usage).

### a. Development Costs

- **Initial Software Development:**
  - This includes frontend/backend development, AI/ML model creation, and system integration.
- **Ongoing Development:**
  - Updates, bug fixes, and new feature development.

### b. Operating Costs

- **Cloud Hosting:** Server costs, cloud storage, and AI/ML model training require cloud computing resources.
  - **Example Estimate:** ₹8,00,000 annually, increasing with the number of users and data processing needs.
- **Support & Maintenance:** Ongoing customer support, system monitoring, and performance optimization.
  - **Example Estimate:** ₹5,00,000 annually.

### c. Marketing and Sales Costs

- **Digital Marketing:** Advertising (Google Ads, Facebook Ads) to acquire institutions.
- **Sales Team:** Salaries and commissions for sales staff who engage with potential institutional clients..

### d. Employee Salaries

- **Development Team:** Software engineers, AI/ML specialists, designers.
- **Administrative Staff:** Support staff, project managers, customer success.

### e. Infrastructure and Tools

- **Software Licenses:** Development tools, AI/ML frameworks, security solutions.

### 3. Sensitivity Analysis

A **sensitivity analysis** helps you understand how changes in key variables, like subscription fees or customer acquisition costs, affect the financial outcomes.

**Example:**

- If **subscription fees** increase by 10%, total revenue grows by 15%.
- If **customer acquisition costs** increase by 10%, profit declines by 5%.

This analysis helps assess the risk and ensure your model is robust under different conditions.

### B. Statistical Analysis & Market Comparison

Here’s a comparison of major players in the AI/ML education sector:

#### 3.1 Financial Comparison

Platform	Annual Revenue (₹)	Operating Cost (₹)	Profit/Loss (₹)	Growth Rate
Khan Academy	₹90 crore	₹80 crore	₹10 crore	10% YoY
Coursera	₹850 crore	₹700 crore	₹150 crore	15% YoY
EdX	₹700 crore	₹600 crore	₹100 crore	12% YoY
Udacity	₹550 crore	₹500 crore	₹50 crore	8% YoY

#### 3.2 Statistical Analysis (Features Comparison)

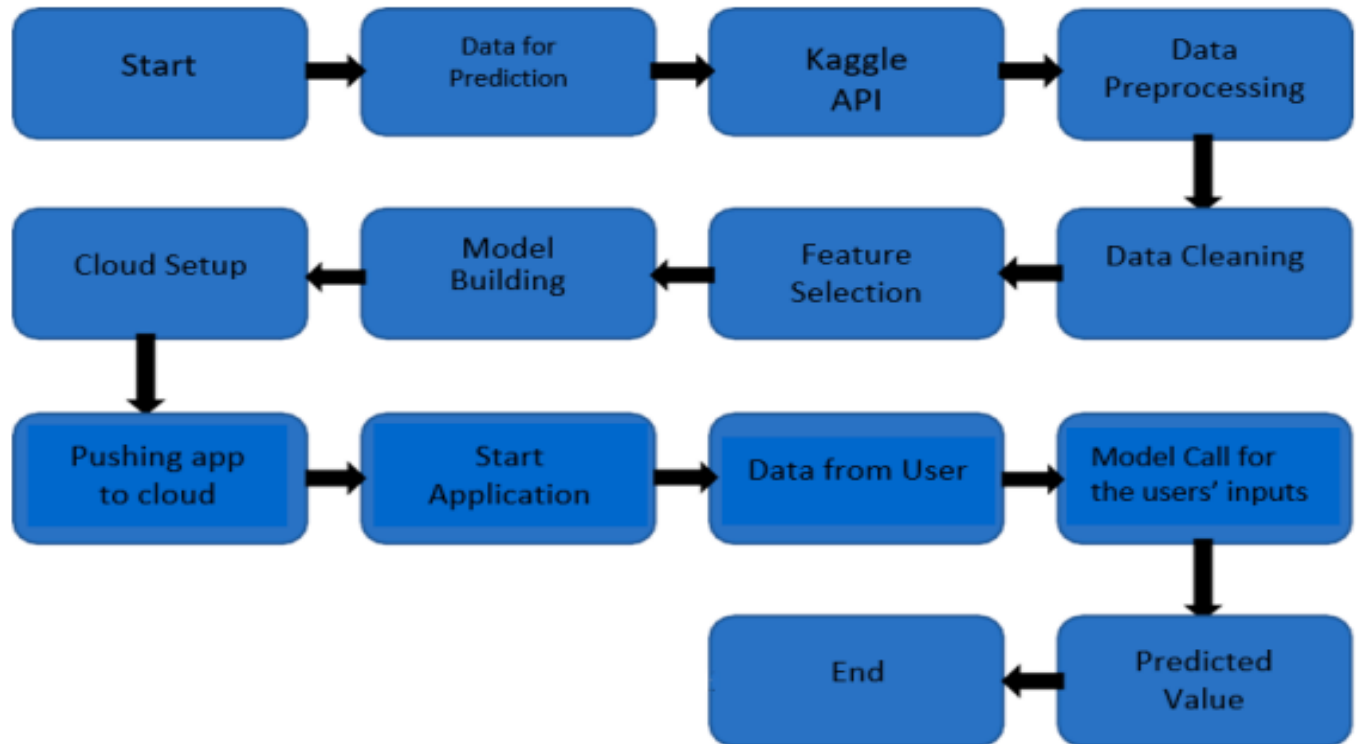
Platform	Predictive Analytics	Sentiment Analysis	Personalization	Engagement Metrics	Annual Growth (%)
Khan Academy	Yes	No	Yes	Yes	10%
Coursera	Yes	Yes	Yes	Yes	15%
EdX	Yes	Yes	Yes	Yes	12%
Udacity	Yes	Yes	Yes	Yes	8%

### 4. Competitive Positioning

- **Khan Academy:** Focuses more on free educational content, heavily relying on donations, but is growing slowly compared to others.
- **Coursera:** Higher revenue and profit margins due to paid certification programs and AI-based content personalization.
- **EdX:** Similar to Coursera, but slightly lower margins due to partnerships with universities offering free content.

- **Udacity:** Specializes in technology-oriented programs with personalized learning, making it competitive in high-tech courses.

### C. Final Design



#### Model Development:

A lot of manual supervised machine learning models can be used to perform the prediction forecasting.

- 1) Data collection and data pre-processing must be done.
- 2) Feature selection and feature engineering techniques should be performed.
- 3) Perform Exploratory Data Analysis to realize the dependent and independent features.
- 4) Algorithm training and optimization must be done to minimize overfitting of the model and hyperparameter tuning.
- 5) Python language and ML models is used for the integration of this product.

#### Front-end:

- 1) Different user interface: The user must be given many options to choose form in terms of parameters. This can only be optimized after a lot of testing and analysis all the edge cases.
- 2) Interactive visualization the data extracted from the trained models will return raw and inscrutable data. This must be present in an aesthetic and an “easy to read” style.
- 3) Feedback system: A valuable feedback system must be developed to understand the needs that have not been met. This will help us train the models constantly.
- 4) HTML/CSS/JS is used for the user’s front-end design.

How does it work (Machine Learning Algorithms)

- Algorithms and Frameworks

This project requires numpy, keras, sklearn, matplotlib, seaborn, plotly, etc.

Code Implementation on a small scale

Link to code [https://github.com/Brahms/FeynnLabs/blob/8cce3fb87e13f1023204d6ed9623e0bd722ae568/student\\_behaviour\\_Analysis\\_Idcation\\_Implementation.ipynb](https://github.com/Brahms/FeynnLabs/blob/8cce3fb87e13f1023204d6ed9623e0bd722ae568/student_behaviour_Analysis_Idcation_Implementation.ipynb)

Visualizations:

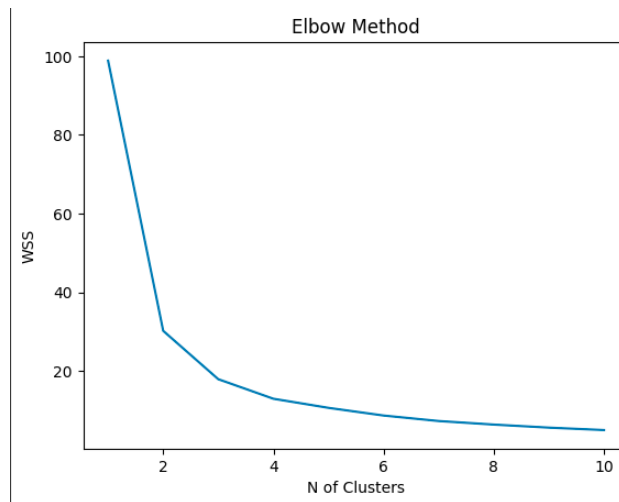


Fig - Using the Elbow Method to find the best K for K-means based on our data

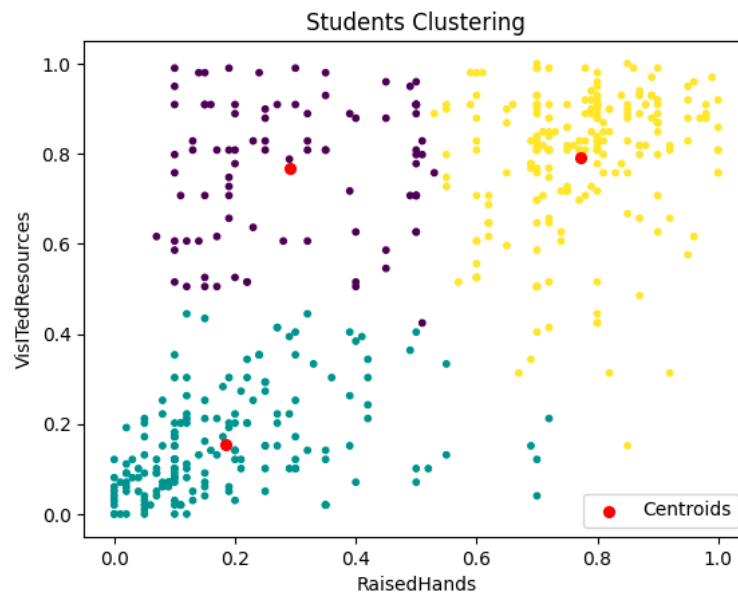


Fig – Clusters to see student levels: High, Mid, Low applied students