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## Ruminix: A Pomodoro Study Platform

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### Abstract:

Students these days have a time staying focused using their study time efficiently. Our solution to this problem is Ruminix, which is an AI-based learning platform that combines the Pomodoro technique, gamification and AI assistance to help students stay focused and learn effectively. Ruminix uses AI to generate personalized study plans and context-related questions based on the content uploaded by the user. Its features include an integrated Pomodoro-based timer, a 2D obstacle course game during breaks to help active recall, a task manager and an analytics section. The platform was designed to foster meaningful engagement and structured learning. Ruminix shows that using tools to stay focused and to learn can make students more productive without sacrificing their interest or feeling of achievement.

**Keywords:** AI; Pomodoro Technique; Gamification; Study Platform; Productivity; Time Management

## 1. INTRODUCTION

Effective learning can be challenging due to stress, distractions, poor time management, and prolonged study sessions. Regular breaks can restore motivation and energy, improving focus and productivity. Ruminix addresses these challenges by using the Pomodoro technique [1–4] to promote concentration, engagement, and consistent study routines.

## 2. LITERATURE REVIEW

Several studies have explored Pomodoro-based learning and gamification to improve student performance. Almalki et al. [5] focused mainly on time management, while gamification research highlighted improved motivation and engagement [3]. Pomodoro can reduce cognitive overload and support structured learning [6]. However, breaks are often used only for rest. Ruminix addresses this gap by combining focus sessions, gamified content, and active recall to make breaks useful for reinforcing learning.

### 3. RESEARCH GAP AND CONTRIBUTION OF RUMINIX

Ruminix combines Pomodoro sessions, gamification, artificial intelligence topic extraction, contextual active recall, and progress analytics to turn focus study sessions into customized learning and reinforcement loops.

### 4. METHODOLOGY

The proposed system ‘Ruminix’ is a web application built to assist students in their academic tasks. This platform makes use of the Pomodoro time management technique which helps students organize their schedule and develop a strong focus on learning the material. The web-app also provides a task management system which has a feature to avoid clustering of deadlines.

#### 4.1. System Synopsis

The system comprises a Pomodoro Timer, AI Study Plan Generator, AI Chatbot, 2D MCQ-based Obstacle Game, and Task Manager. After each study session, the game reinforces learning through active recall, while the task manager prioritizes tasks based on earliest deadlines. The overall workflow integrates focused study, AI assistance, gamified learning, and task management.

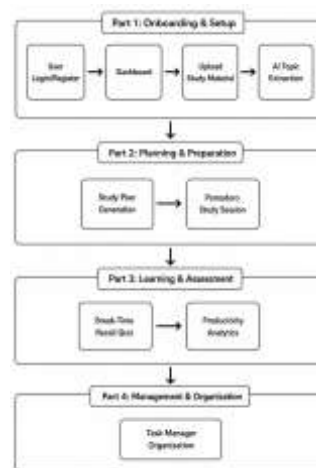


Figure 4.1. System Flowchart

#### 4.2. AI-Based Study Plan Generator

The AI module extracts key topics and subtopics from uploaded materials, evaluates their complexity and required study time, and generates a structured study plan with Pomodoro sessions and key points.

#### 4.3. Pomodoro-Based Timer

Students study a selected topic for 25 minutes, followed by a short break. During the break, a 2D obstacle game reinforces learning through active recall, after which the next session begins with a new subtopic.

#### 4.4. *Gamified Active Recall Model and Analytics Section*

Learning through gamification is included as part of the platform in the course of breaks through topic-based MCQs to improve retention. Evaluation of students' understanding after games reveals areas where they need further study.

#### 4.5. *Task Management System*

The task management system helps students organize their tasks. The manager allows students to create tasks, describe them and add deadlines. The specification of deadlines helps students avoid deadline clustering, i.e. if some of the tasks fall on the same day or fall consecutively. The manager helps students track their tasks as well as progress which enables students to maintain a better control over their academic as well as personal workload.

### 5. IMPLEMENTATION / SYSTEM DESIGN

#### 5.1. *System Architecture*

The planning tool is built using a hierarchical architecture of three layers: User Interface, Processing, and Data Management layers. It utilizes the use of topic recognition using AI, study plan creation, Pomodoro sessions, ChatBot integration, Supabase services, multi-file handling, and HTML5 games for efficient learning.

### 6. RESULTS / EVALUATION

#### 6.1. *System Functionality*

The AI-supported module helped in the generation of personal Pomodoro study schedules, handled deadlines, and analyzed learning progress based on study streaks, time spent studying, and game-based tests.

#### 6.2. *Productivity and Engagement Analysis*

The Pomodoro-based learning platform helped sustain focus by dividing the study material into study sessions of a particular period i.e. 25 minutes. This short time period helped students pay undivided attention to a particular topic. It did not overwhelm the students and increase their cognitive and academic stress. The 2D obstacle game helps students reset and refresh their memories. This proved to improve students' memory, their engagement with our system and instilled an active recall habit in them.

#### 6.3. *Analytics Section*

The platform includes an analytics dashboard that tracks completed Pomodoro sessions, study-plan progress, study streaks, and productivity. It also helps students prioritize tasks and stay motivated.

**Table 1. Feature Evaluation**

| Feature                 | Purpose                        | Evaluation              |
|-------------------------|--------------------------------|-------------------------|
| AI Study Plan Generator | Creates structured study plans | Reduced planning effort |

| Feature               | Purpose                         | Evaluation                       |
|-----------------------|---------------------------------|----------------------------------|
| Pomodoro Timer        | Provides focused study sessions | Improved concentration           |
| Gamified Recall       | Uses MCQs for active recall     | Improved retention               |
| Productivity Analysis | Tracks study progress           | Improved productivity monitoring |
| Task Manager          | Manages tasks and deadlines     | Improved task organization       |

#### 6.4. *Final Evaluation*

The evaluation indicates that Ruminix improved students' focus, productivity, and study consistency. The AI chatbot reduced distractions, the study planner simplified scheduling, the gamified game supported active recall, and the task manager helped students organize and complete tasks efficiently.

### 7. DISCUSSION

Ruminix automates study planning by extracting topics from uploaded notes and dividing them into timed study sessions and breaks. Breaks include gamified MCQs and active recall to reinforce learning. Key design challenges included reducing distractions, balancing automation with user control, and restricting AI responses to relevant study content. These were addressed through a user-friendly modular interface, text preprocessing, and a "Know More" feature.

### 8. CONCLUSION

Ruminix combines Pomodoro-based focused learning, AI study planning, gamified breaks, and contextual MCQs to improve concentration, time management, and knowledge retention. The platform also tracks progress and identifies areas needing improvement. Future enhancements include advanced analytics, mobile support, predictive recommendations, and collaboration features.

### 9. REFERENCES

- [1] Smits, E.J.C, N. Wenzel, and A. de Bruin, "Investigating the Effectiveness of Self-Regulated, Pomodoro, and Flowtime Break-Taking Techniques among Students," *Behavioral Sciences*, vol. 15, no. 7, p. 861, 2025.
- [2] J. Costales, J. A. Abellana, J. S. Gracia, and M. Devaraj, "A learning assessment applying Pomodoro technique as a productivity tool for online learning," in *Proc. 13th Int. Conf. Education Technology and Computers (ICETC 2021)*, Wuhan, China, 2021, pp. 164–167.
- [3] H. Ukgoda, "Gamification in education: Its impact on engagement, motivation, and learning outcomes," *Journal of Educational Technology Development and Exchange (JETDE)*, vol. 18, no. 3, pp. 41-66, 2025.
- [4] J. J. González-García, E. Pretel, V. López-Jaquero, F. Montero, and P. González, "Smart-Pomodoro: A Tool to Gamify Children's Study Sessions," in *Human-Computer Interaction – INTERACT 2025: 20th IFIP TC13 Int. Conf.*, Belo Horizonte, Brazil, 2025, pp. 255–274.
- [5] K. Almalki, O. Alharbi, W. Al-Ahmadi, and M. Aljohani, "Anti-Procrastination Online Tool for Graduate Students Based on the Pomodoro Technique," in *Learning*

- and Collaboration Technologies: Human and Technology Ecosystems, 7th Int. Conf., LCT 2020 (HCII 2020), Copenhagen, Denmark, 2020, pp. 133–144.
- [6] W. P. M. A. Pratama, W. Astuti, W. Nahrowi, W. Jannah, and W. Utami, “Implementation of the Pomodoro Method to Improve Student Learning Outcomes in Natural and Social Sciences Learning at MIN 20 Banjar,” *Indonesian Journal of Education and Social Humanities*, vol. 1, no. 2, pp. 46–54, 2024.

## Biographies



**Khushi Shah** is a Computer Engineering student at SVKM’s NMIMS, MPSTME, Mumbai, and a researcher in AI-driven learning tools. She contributed to Ruminix’s AI study planning and topic extraction components.



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