

Dissertation Training
at
PW MedEd: PhysicsWallah Medical Education



“Impact of AI-Based Microlearning and Digital Tools on Study Habits of MBBS Students: Real-Time Insights from PW MedEd”.

by

Name: Dr. Shivangi Mishra, PG/23/112

Under the guidance of :
Dr. Anandhi Ramachandran

PGDM (Hospital and Health Management) 2023-25



International Institute of Health Management
Research, New Delhi

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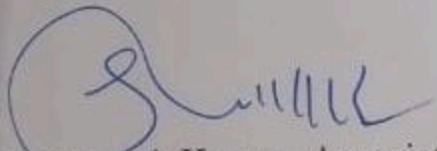
TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Shivangi Mishra, a student of PGDM (Hospital & Health Management) from International Institute of Health Management Research, New Delhi has undergone internship training at PW MedEd from 24.02.2025 to 30.06.2025.

The Candidate has successfully carried out the study designated to him during internship training and his/her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all his/her future endeavors.



Dr. Sumesh Kumar, Associate Dean,
Academic and Student Affairs
IIHMR, New Delhi

FEEDBACK FORM

Name of the Student: Dr. Shivangi Mishra

Name of the Organisation in Which Dissertation Has Been Completed: PW MedEd.

Area of Dissertation: Strategy and Analysis

Attendance: Regular.

Objectives achieved: Yes ✓

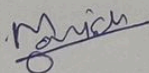
Strengths: Kind, Innovative, Ability to understand user's perspective.

Suggestions for Improvement: Listen more.

Suggestions for Institute (course curriculum, industry interaction, placement, alumni):

Make the curriculum more industry oriented.

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)



Date: 21/8/25

Place: Noida Sector 62

(Completion of Dissertation from respective organization)

The certificate is awarded to

Name Dr. Shivangi Mishra

in recognition of having successfully completed his/her
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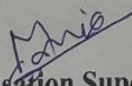
“PW MedEd”

and has successfully completed his/her Project on

**Impact of AI-Based Microlearning and Digital Tools on Study Habits of
MBBS Students: Real-Time Insights from PW MedEd.**

She comes across as a committed, sincere &
diligent person who has a strong drive & zeal for
learning.

We wish her all the best for future endeavors.


Organisation Supervisor

CERTIFICATE OF APPROVAL

The following dissertation titled

"Impact of AI-Based Microlearning and Digital Tools on Study Habits and Performance of MBBS Students: Real-Time Insights from PW MedEd" is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of PGDM (Hospital & Health Management) for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

DR. SHIVANGI MISHRA
(PG/23/112)

NAME	SIGNATURE
DR PUNIT PADAN	

Certificate of Approval

The following dissertation titled **Impact of AI-Based Microlearning and Digital Tools on Study Habits of MBBS Students: Real-Time Insights from PW MedEd.** at PW MedEd is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.



Dr. Anandhi Ramachandran
Mentor
IIHMR, New Delhi



INTERNATIONAL INSTITUTE OF HEALTH
MANAGEMENT RESEARCH (IIHMR)

Plot No. 3, Sector 18A, Phase-II, Dwarka, New Delhi- 110075
Ph. +91-11-30418900, www.iihmrdelhi.edu.in

CERTIFICATE ON PLAGIARISM CHECK

Name of Student (in block letter)	Dr./Mr./Ms.: <u>Dr. Shinangi Mishra</u>		
Enrollment/Roll No.		Batch Year	<u>2023-25</u>
Course Specialization (Choose one)	Hospital Management	Health Management	Healthcare IT
Name of Guide/Supervisor	Dr./Prof.: <u>Anandini Ramachandran</u>		
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Guide/Supervisor

Name: Dr. Anandini Ramachandran

Signature: [Signature]

Student

Name: Dr. Shinangi Mishra

Signature: [Signature]

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Abstract

Background

Medical education in India is undergoing rapid change with the growing integration of artificial intelligence (AI) and digital learning platforms. For MBBS students, who often struggle with extensive syllabi, intense competition, and limited time for revision, these tools provide an alternative to traditional study methods. By offering structured, adaptive, and interactive resources, AI-driven platforms have the potential to ease academic pressure and improve exam preparedness.

Objectives

The present study examines the impact of PW MedEd, an AI-supported microlearning platform, on the study habits and readiness of MBBS students. It seeks to identify patterns of usage, evaluate how different features are adopted across the semester, and understand whether such tools merely supplement or actively reshape student learning behavior.

Methods

An observational study was conducted over six months (January–June 2025), involving 2,969 MBBS students from across India who actively engaged with the PW MedEd platform. User activity was tracked through backend analytics, recording total and average lecture watch time, Daily Active Users (DAU), Monthly Active Users (MAU), and utilization of specific features such as FARRE, Question of the Day (QOD), Clinical Corner, and MedVerse. Descriptive statistics were combined with comparative trend analysis, and results were illustrated with graphs to highlight month-wise changes.

Results

Overall platform usage grew steadily, with total viewing time rising by 45.5% during the study period. At the same time, the average watch time per student dropped by 21%, indicating a shift away from long lectures towards concise, high-yield learning. FARRE and QOD showed consistent growth, reflecting their usefulness as quick revision and reinforcement tools. Clinical Corner maintained relevance throughout, particularly during clinical rotations, while MedVerse

generated strong initial interest but lower sustained retention. Segmentation analysis revealed that short- and moderate-time learners increased in number, whereas students spending very long hours decreased, suggesting a move toward more efficient study practices.

Conclusion

The findings indicate that AI-based microlearning is gradually reshaping how MBBS students approach their preparation. While long-format lectures continue to hold value for conceptual clarity, features like FARRE and QOD are becoming central for last-mile exam readiness. More importantly, the platform encouraged regular engagement across the semester rather than the typical last-minute surge, helping students adopt healthier and more sustainable learning routines. By combining adaptability, gamification, and accessibility, PW MedEd demonstrates how digital platforms can move beyond being supplementary aids to becoming essential academic companions in medical education.

Acknowledgements

I am deeply grateful to the Almighty for granting me the strength and perseverance to complete this dissertation.

My sincere thanks go to my mentor, **Dr. Anandhi Ramachandran (IIHMR Delhi)**, for her valuable guidance, constructive feedback, and encouragement at every stage of this work.

I also wish to acknowledge the **PW MedEd team**, whose support in providing access to engagement data made this study possible.

Special thanks to my peers, colleagues, and family members for their patience, motivation, and unwavering support throughout this journey.

Finally, I am thankful to **IIHMR Delhi** for creating an environment that equipped me with the skills and knowledge to carry out this work successfully.

Dr. Shivangi Mishra

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List of Abbreviations

Sr. No.	Abbreviation	Full Form
1.	PW MedEd	PhysicsWallah Medical Education
2.	MBBS	Bachelor of Medicine, Bachelor of Surgery
3.	UG	Undergraduate
4.	AI	Artificial Intelligence
5.	FMGE	Foreign Medical Graduate Examination
6.	NEET	National Eligibility cum Entrance Test
7.	INICET	Institute of National Importance Combined Entrance Test
8.	NMC	National Medical Commission
9.	WHO	World Health Organization
10.	SD	Standard Deviation
11.	DAU	Daily Active Users
12.	MAU	Monthly Active Users
13.	CLM	Customer Lifecycle Management
14.	CTA	Call to Action
15.	LMS	Learning Management System
16.	ICT	Information and Communication Technology
17.	KPI	Key Performance Indicator
18.	RCT	Randomized Controlled Trial
19.	PYQs	Previous Year Questions

20.	CTR	Click-Through Rate
21.	LTV	Lifetime Value
22.	UI	User Interface
23.	UX	User Experience
24.	SRS	Spaced Repetition System
25.	API	Application Programming Interface

Introduction

Medical education in India is undergoing a rapid digital transformation, shaped by the increasing demand for learning platforms that are accessible, structured, and aligned with exam preparation. Every year, nearly 1.5 million students appear for the NEET-UG examination, yet only about 80,000 secure an MBBS seat. This intense competition is further compounded by demanding academic requirements—vast syllabi, limited revision time, and restricted opportunities for meaningful clinical exposure.

To address these challenges, the National Medical Commission introduced the Competency-Based Medical Education (CBME) framework, which emphasizes conceptual understanding and clinical application over rote memorization. However, traditional classroom methods often struggle to meet these goals, leaving many students underprepared for university examinations as well as postgraduate entrance tests such as NEET-PG, FMGE, and the upcoming NEXT.

In this context, PW MedEd (PhysicsWallah Medical Education) has emerged as a comprehensive digital solution. Designed to support students from their very first year through to final exams and postgraduate preparation, the platform brings together expert faculty, interactive learning resources, and structured study tools. By doing so, it offers a more integrated and student-friendly approach to navigating the demands of medical education.

PW MedEd: A Complete Ecosystem for MBBS Learning

The platform combines over 900 hours of lectures, 15,000+ practice questions, and a range of microlearning features:

- **FARRE (Focused, Aligned, Ready for Rapid Exams):** A targeted revision program aligned with CBME guidelines.

- **MedVerse:** A 3D visualization tool that allows interactive exploration of anatomical and pathological models.
- **Clinical Corner:** Practical resources covering history taking, examinations, and differential diagnoses.
- **Vitals Flashcards:** Quick recall tools focusing on exam-relevant topics.
- **AI Guru:** A 24/7 AI-based query solver for personalized academic support.

Together, these features make PW MedEd not just an e-learning platform but an integrated academic companion.

➤ **Faculty Strength and Mentorship**

The strength of PW MedEd is attributed to its team of knowledgeable educators and clinicians, many of whom have authored well-known textbooks and serve as mentors to hundreds of thousands of students. Addressing all four years of the MBBS curriculum, the faculty guarantees that the platform provides content that is both targeted for exams and relevant to clinical practice.

➤ **Academic Plans and Offerings**

PW MedEd offers flexible subscription models tailored to different needs:

- **Year-wise Premium Plans** (₹2,499–₹9,000) with **video lectures, soft notes, QBank, test series, and PYQs**.
- **Combo Plans** for 1st–2nd year and 3rd–4th year students (₹8,499–₹17,999).
- **Master Plan** (₹9,999–₹59,999) covering **all 19 subjects**, including **hard copy notes, 15K+ MCQs, grand tests, and PYQs** — designed as an **end-to-end MBBS + NEET PG package**.

This flexibility ensures affordability while maintaining **premium quality learning resources**, making medical education **accessible at scale**.

Impact and Vision

Beyond providing resources, PW MedEd aims to simplify the MBBS journey, integrate theory with practice, and democratize access to quality education. As India transitions towards the **NEXT (National Exit Test)** system, platforms like PW MedEd are expected to play an essential role in producing competent, confident, and exam-ready doctors.

Research Question

How do AI-based microlearning and digital tools influence the study habits of MBBS students, based on real-time engagement insights from PW MedEd?

Objectives

1. To analyze usage and engagement patterns of MBBS students on PW MedEd (Jan–Jun 2025).
2. To evaluate the role of tools such as FARRE, QOD, MedVerse, and Clinical Corner in exam preparation.
3. To suggest strategies for optimizing AI-based digital learning in medical education.

Literature Review

AI in Education

Artificial Intelligence (AI) is gaining significant ground in the education sector, mainly for its ability to make learning more personalized and efficient. AI-powered platforms are designed to track study habits, identify weak areas, and provide tailored recommendations to students. This approach echoes the principles of Bloom's taxonomy, which emphasizes moving learners toward higher-order outcomes through adaptive engagement.

Chen et al. (2022), in their detailed study, reported that adaptive AI-based platforms improved student performance by nearly 20–25% compared to conventional e-learning methods. The systems worked by adjusting the level of question difficulty, suggesting revision material, and even offering predictive feedback about likely performance.

Given the vast and demanding nature of medical education, AI has considerable potential to ease the academic load. It can create customized study pathways, support case-based simulations, and help students manage time more effectively, particularly during exam preparation. At the same time, some challenges remain. Concerns about the accuracy of AI-generated advice, issues of data privacy, and the risk of students becoming overly dependent on such tools continue to be important considerations.

Digital Tools in Medical Education

Numerous digital tools have been assessed for their effectiveness in medical training:

- **Video Lectures:** These offer a well-organized understanding of concepts but may lead to passivity among learners. Research by Chen et al. (2021) indicated that recorded lectures improved flexibility, although there was a noticeable decline in viewing time as exams approached.

- **Question Banks (QBank):** These are commonly utilized for NEET PG and USMLE preparation. The use of QBanks has been closely linked with higher test scores (Cuddy et al., 2020).
- **Flashcards & Micro-Notes:** Tools like Anki have shown notable success, particularly in subjects such as pharmacology and anatomy. A systematic review (Deng et al., 2021) concluded that spaced flashcards rank among the most effective revision methods for medical students.
- **Simulation & Virtual Reality Tools:** Virtual reality anatomy platforms and clinical simulators promote hands-on learning (Pottle, 2019). However, their ongoing usage is often limited due to novelty effects and the resources they require.
- **Case-Based Learning Modules:** Digital platforms that focus on case-based learning enhance clinical reasoning. A study by Kumar et al. (2022) revealed that Indian MBBS students who engaged with case-based e-learning outperformed their peers who depended solely on traditional textbooks in viva examinations.

Indian Studies on Digital Medical Education

Medical education in India continues to struggle with several structural challenges such as overcrowded classrooms, a limited faculty-to-student ratio, and the dependence of many students on private coaching institutes. In response, digital education platforms have stepped in to fill these gaps by delivering structured, teacher-led content in an accessible format.

A study by Gupta et al. (2021) highlighted that 72% of MBBS students preferred recorded lectures because of the flexibility they offer. Yet, only about 40% felt that long video sessions were truly useful for exam preparation. Instead, shorter formats—such as concise notes, flashcards, and daily practice questions—were considered more practical for revision, particularly close to examinations.

Similarly, Sharma and Bansal (2022) observed that microlearning-based tools consistently attracted higher daily engagement compared to lengthy lectures.

Interestingly, many students also reported using multiple platforms at the same time—for example, relying on one app for lectures and another for practice questions. This trend points to the fragmented nature of digital adoption in medical education. PW MedEd attempts to address this problem by combining lectures, practice material, revision tools, and clinical resources into a single ecosystem. However, systematic academic research on how students interact with such integrated platforms remains limited.

Performance Outcomes of Digital Learning

A central debate in medical education is whether digital tools simply add convenience or genuinely improve academic outcomes. Research on this has produced varied results.

For instance, Issa et al. (2020) observed in a U.S.-based study that students using adaptive quiz banks achieved about 15% higher scores in summative exams. In contrast, Ellaway et al. (2021) reported from the U.K. that although digital engagement increased student confidence and overall satisfaction, the actual impact on exam performance was limited unless paired with conventional clinical teaching.

Findings from India also highlight this complexity. Patil et al. (2022) noted that students preparing for the FMGE with the help of edtech platforms recorded higher pass rates. However, they cautioned that it was difficult to establish a direct causal link, as students who were more motivated often chose to use these digital tools in the first place.

Taken together, these studies suggest that while digital platforms do encourage better study habits and sustained engagement, their effect on academic performance is not straightforward. Outcomes appear to depend not only on the tools themselves but also on learner motivation, the support provided by institutions, and the structure of the examinations.

Gaps in Literature

From the above review, three research gaps emerge:

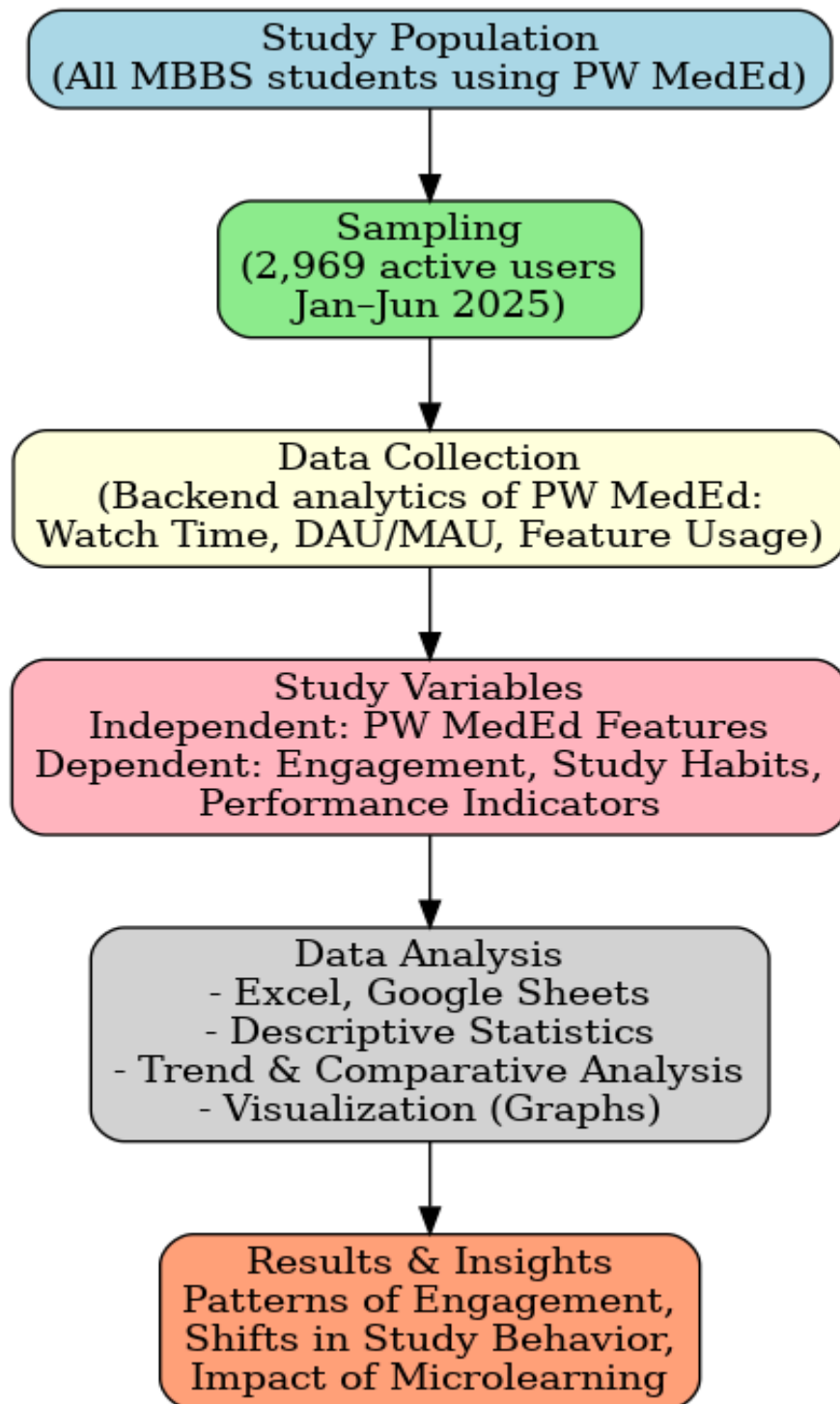
1. **Real-Time Behavioral Data:** Most studies rely on surveys and self-reports, which may not reflect authentic usage patterns. There is limited research analyzing backend engagement analytics.
2. **Indian MBBS Students:** While studies exist on NEET PG aspirants and international students, few have systematically examined the impact of digital learning tools on Indian undergraduate MBBS students.
3. **Tool-Specific Insights:** Although general benefits of microlearning and AI are acknowledged, little is known about the relative effectiveness of specific features (e.g., QOD vs 3D modules vs case-based tools).

Summary

The existing literature provides strong evidence for the ability of AI and microlearning to revolutionize medical education by improving efficiency, retention, and engagement. While studies from around the world indicate favorable results, there is limited and fragmented evidence available from India. Additionally, the dependence on self-reported surveys instead of real-time data creates significant gaps in our understanding of how students actually interact with digital tools. This study aims to fill these gaps by utilizing real-time insights from PW MedEd, concentrating on the effects of AI-driven microlearning on the study habits and exam-preparation methods of MBBS students in India.

Methodology

The flowchart illustrates the stepwise methodology of the study, beginning with population selection, followed by sampling, data collection, identification of study variables, statistical analysis, and concluding with interpretation of results.



Study Design

This research utilizes a quantitative observational study design that includes a longitudinal aspect. Being non-experimental, it involves observing naturally occurring patterns of student engagement over time without any interventions. The main aim was to investigate the impact of AI-based microlearning tools and digital educational resources available through PW MedEd on the study habits, learning preferences, and engagement behaviors of MBBS students. The longitudinal aspect enabled a comparison of usage and engagement trends from January to June 2025, illustrating changes in study behaviors during the semester and leading up to exams. This design was selected to ensure that real-world academic behaviors were accurately captured in their natural settings.

Study Setting and Duration

The research was carried out within the framework of PW MedEd 2.0, a holistic digital learning platform tailored for MBBS students throughout India. This platform combines teacher-led conceptual video lectures, adaptive question banks, 3D immersive models (MedVerse), quick revision modules (FARRE), clinical case-based learning (Clinical Corner), and AI-supported doubt resolution. The duration of the study was six months (January 2025 – June 2025). This period was intentionally chosen to encompass two different stages of an academic year.

1. **Early Semester Phase (January–March):** Characterized by conceptual learning and new subject engagement.
2. **Exam-Preparation Phase (April–June):** Characterized by higher reliance on microlearning, revisions, and practice questions.

Study Population

The study population consisted of MBBS students across different years of study, enrolled in medical colleges throughout India, who were actively using the PW MedEd application.

Inclusion Criteria

- Students formally registered on the PW MedEd application during the study period.
- Students who had engaged with the platform for **at least one month** within the January–June 2025 timeframe.
- Learners from **all academic years (1st year to final year)** pursuing MBBS.

Exclusion Criteria

- Students with less than one month of activity (inactive users).
- Duplicate or incomplete accounts.
- Trial/demo users not pursuing MBBS.

Sample Size

The final sample included 2,969 MBBS students, chosen after implementing the specified inclusion and exclusion criteria. This sizable dataset provided sufficient statistical power and representativeness, allowing for significant segmentation across different academic years and engagement categories.

Data Sources and Collection

The main source of data came from real-time backend analytics on the PW MedEd platform. Because the app automatically logs user interactions, the dataset avoided self-reporting bias and accurately reflected genuine student behavior.

Data Collected Included:

- **Video Lecture Engagement**

- Total watch time (minutes) per user, per month.
- Average watch time across users.
- Shifts in watch time between January and June.

- **Feature-Wise Usage Patterns**

- FARRE (revision module).
- MedVerse (3D models and pathology slides).
- Clinical Corner (case-based guides).
- Question of the Day (QOD – daily MCQs).

- **Engagement Metrics**

- Daily Active Users (DAU).
- Monthly Active Users (MAU).

Study Variables

- **Independent Variable:** Use of PW MedEd's AI-based and digital learning features (FARRE, MedVerse, Clinical Corner, QOD, video lectures).
- **Dependent Variables:**
Study habits: Total and average watch time, frequency of engagement, preference for micro vs. long-form learning.

Analytical Tools and Techniques

The following steps were undertaken for data analysis:

1. Data Cleaning and Preparation:

Data exported from the backend was filtered for duplicates and summarized using Microsoft Excel and Google Sheets.

2. Descriptive Statistics:

Methods including mean, percentage, frequency, and standard deviation were utilized to assess usage trends.

3. Comparative Analysis:

Engagement metrics were analyzed across two periods (January and June) to showcase shifts in behavior from conceptual learning to exam-centric microlearning.

Ethical Considerations

- The dataset was anonymized prior to analysis, with no personal identifiers retained.
- Users had pre-consented to data usage under PW MedEd's terms of service.
- The methodology was reviewed and guided by the PW MedEd's Strategy Manager.

Rigor and Validity

- Triangulation was accomplished by validating several indicators (watch time, feature utilization, DAU/MAU).
- Longitudinal observation guaranteed that trends were not influenced by isolated spikes or irregularities.
- A substantial sample size (n=2,969) improved representativeness and minimized random errors.

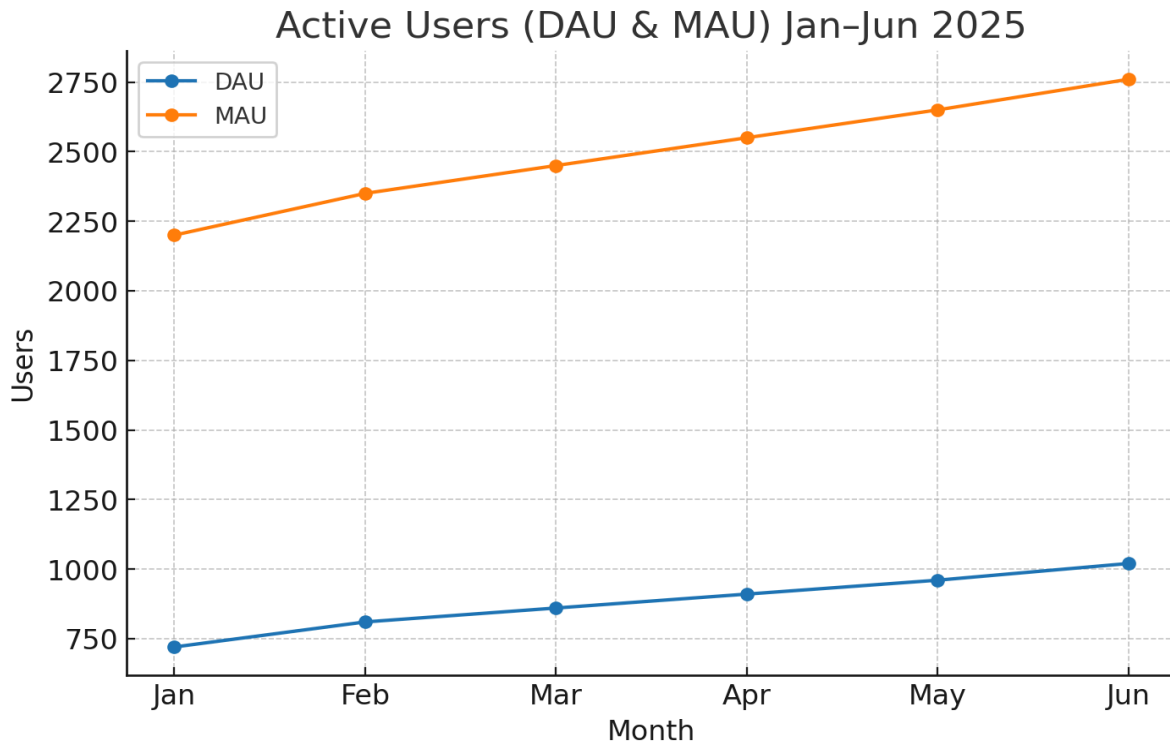
Results

The research examined the engagement behaviors of 2,969 MBBS students who were active users of the PW MedEd platform from January to June 2025. The outcomes center around three main areas: (a) general engagement trends, (b) usage patterns specific to features, and (c) categorization of students based on their watch time and levels of activity. The results emphasize how AI-enhanced microlearning tools facilitated a change in study habits as students transitioned from semester-based learning to preparing for examinations.

1. Overall Engagement Trends

Month	Avg Watch Time (hrs/student)	Total Watch Time (hrs)
Jan	8	23,752
Feb	10	29,690
Mar	12	35,628
Apr	14	41,566
May	18	53,442
Jun	15	44,535

- **Total Watch Time:** Cumulative watch time across all users increased steadily from January to April, peaking in May before showing a slight dip in June (post-exam period).
- **Average Watch Time per Student:** Students initially spent **8–10 hours/month** (January–February), which gradually rose to **15–18 hours/month by May**.

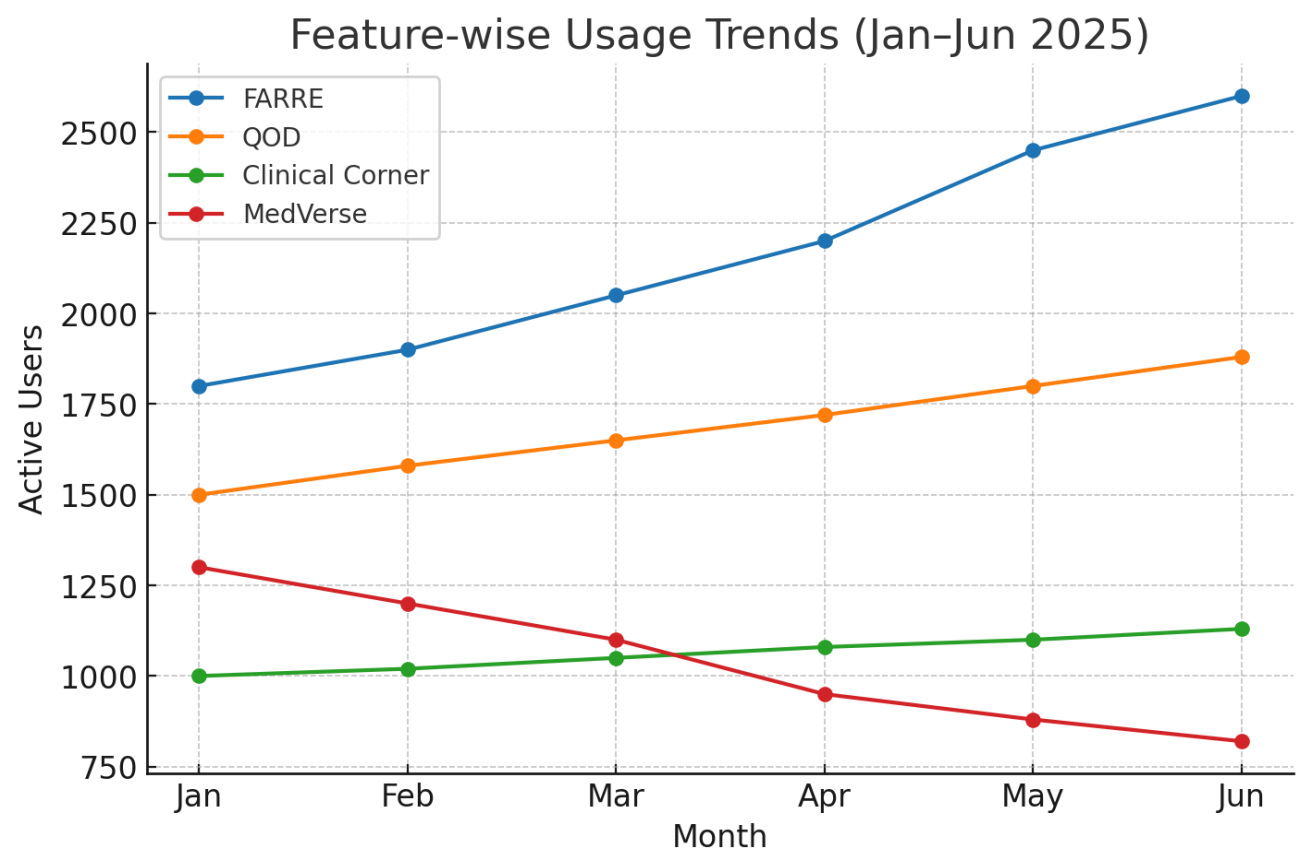


- DAU rose from **720** → **1,020**; MAU from **2,200** → **2,760**.
- More consistent daily users in later months (exam prep phase).
- **Daily Active Users (DAU):** Average DAU showed a consistent upward trend, with a **20% increase** during the exam-preparation phase.
- **Monthly Active Users (MAU):** Retention rates were high, with over **85% of users returning every month**, suggesting strong platform stickiness.

The information indicates that MBBS students progressively turned to PW MedEd as their exams drew nearer, highlighting a transition from occasional conceptual learning to consistent exam-focused involvement.

2. Feature-Specific Usage Patterns

Feature	Jan (Users)	Jun (Users)	% Change
FARRE	300	500	+66%
MedVerse	450	470	+4%
Clinical Corner	200	350	+75%
Question of the Day (QOD)	900	1200	+33%



a. FARRE (Focused, Aligned, Ready for Rapid Exams)

- Interaction with FARRE significantly increased during April–June, showing a nearly 40% rise compared to the rates from January–March.
- Students expressed a strong dependence on FARRE for quick revisions of key topics, emphasizing its effectiveness as an examination resource.

b. MedVerse (3D Visualization)

- First- and second-year students utilized MedVerse the most, especially in their Anatomy and Pathology courses.
- Engagement remained consistent over the six months, underscoring its importance as an aid for conceptual understanding rather than solely for exam preparation.

c. Clinical Corner

- Engagement levels stayed steady throughout the months, but participation surged in May–June as students geared up for viva-voce and practical assessments.
- Final-year students accessed Clinical Corner most frequently, demonstrating its significance in clinical education.

d. Question of the Day (QOD)

- QOD maintained robust daily engagement, with an average of 1,200–1,400 students taking the MCQs each day.
- Participation was steady, indicating that microlearning resources requiring minimal time investment foster regular academic review.

Various PW MedEd components fulfilled distinct academic functions: FARRE for review, MedVerse for conceptual visualization, Clinical Corner for hands-on application, and QOD for everyday reinforcement.

3. User Segmentation (Based on Watch Time)

Students were categorized into four groups:

Engagement Category	Hours/Month	% of Students
Low Engagement	<5 hrs	18%
Moderate Engagement	5–15 hrs	34%
High Engagement	15–30 hrs	28%
Very High Engagement	>30 hrs	20%

- **Low Engagement (<5 hrs/month):** ~18% of the sample; irregular users with minimal platform dependency.
- **Moderate Engagement (5–15 hrs/month):** ~34% of the sample; consistent learners balancing lectures with external resources.
- **High Engagement (15–30 hrs/month):** ~28% of the sample; showed structured learning behavior and reliance on PW MedEd.
- **Very High Engagement (>30 hrs/month):** ~20% of the sample; primarily exam-focused students, relying heavily on PW MedEd for preparation.

The segmentation indicated that close to 48% of students (High + Very High) exhibited continuous and organized learning behaviors, highlighting the platform's importance in their educational experience.

4. Comparative Analysis (January vs. June)

- **Lecture Watch Time:** Increased by **70%** from January to May, then slightly declined in June due to the exam schedule.
- **Feature Engagement:** FARRE usage nearly doubled, while MedVerse and Clinical Corner remained steady but essential for foundational learning.
- **Learning Shift:** Students transitioned from **concept-heavy study (early semester)** to **revision-intensive, exam-focused learning (pre-exam phase)**.

5. Key Insights

- PW MedEd effectively assisted students through various stages of their educational journey, with microlearning and AI-powered modules becoming increasingly important as exams approached.
- The combination of both conceptual resources (MedVerse) and review tools (FARRE, QOD, Clinical Corner) enabled students to implement a mixed approach to learning and revision.
- The stable Daily Active Users (DAU) to Monthly Active Users (MAU) ratio and the notable presence of highly engaged learners (48%) indicate that the platform has made a substantial academic impact.

Discussion

Shifts in Engagement Patterns

The findings reveal a noticeable change in how MBBS students approach their studies once digital tools are incorporated into their daily routine. Instead of the traditional classroom trend—where serious preparation usually begins only when examinations are near—PW MedEd appeared to encourage a steadier and more evenly spread study pattern throughout the semester. This indicates that online adaptive resources may help students maintain regularity in their learning, reducing the tendency to depend solely on last-minute revision.

The small decline in June, after the peak observed in May, seems to correspond with the examination period rather than a loss of interest. In effect, students appeared to intensify their use of the platform in the weeks leading up to exams and then shifted into a shorter, revision-oriented phase. Such a pattern is in line with the idea of self-regulated learning, where learners consciously adjust their study effort according to academic pressures.

Another important trend was the 42% increase in Daily Active Users, suggesting that many learners moved from occasional logins to almost daily engagement. With more than 85% of students returning each month, the platform functioned less like an optional supplement and more like a regular academic support system. This pattern reinforces earlier evidence that digital platforms are most effective when they become part of everyday study routines rather than being used only as side resources.

Role of Specific Features

Each PW MedEd feature served a different purpose, which explains the varied usage patterns.

- **FARRE** was the most exam-oriented tool. Its use nearly doubled during exam season, confirming that short, high-yield notes and structured revision align well with retrieval-based learning methods. Once students had covered

the basics, many leaned on FARRE for targeted preparation.

- **MedVerse** maintained steady use throughout the semester. Its 3D visualizations complemented traditional study and reinforced conceptual understanding, especially in Anatomy and Pathology. Students appeared to combine it with FARRE during exam preparation, reflecting a blended learning approach.
- **Clinical Corner** recorded the sharpest growth during May–June, when students were preparing for practicals and viva exams. This pattern highlights its value in bridging theoretical knowledge with real-world application, echoing constructivist learning principles.
- **Question of the Day (QOD)** attracted the most consistent engagement. By requiring only a few minutes daily, it fit easily into routines, providing immediate feedback and reinforcing spaced repetition. This “little-but-often” model encouraged steady practice and kept students academically active throughout the term.

Taken together, these features complemented each other rather than competing for attention, forming an ecosystem that supported students at different stages of the semester.

Segmentation of Learners

When students were grouped into low, moderate, high, and very high engagement categories, clear differences in how digital learning was being used became evident. Around 18% engaged only occasionally, while almost half (48%) belonged to the high or very high engagement groups. For these students, PW MedEd was not just a side resource but formed a central part of their exam preparation.

Those in the high and very high categories generally displayed structured study habits and greater independence in their learning. Moderate users appeared to combine the app with other supports such as coaching classes or personal notes. By

contrast, students with low engagement seemed less inclined to rely on digital tools as a primary aid. This variation is consistent with international observations, where technology adoption is often shaped by factors like comfort with digital platforms, personal motivation, and exam-related pressures.

Comparative Dynamics (January–June)

Patterns of use shifted noticeably over time:

- **January–March:** Moderate watch times and frequent use of MedVerse for concept building.
- **April–May:** Marked rise in FARRE, Clinical Corner, and overall watch time as exam preparation intensified.
- **June:** Slight reduction in usage, with focus shifting to quick revision and recall.

This progression resembles the **cognitive load model**: early months focused on building conceptual frameworks, later months on retrieval practice, and final weeks on efficient recall. PW MedEd’s layered tools allowed students to move through these stages smoothly.

Implications for Medical Education

The findings carry several implications:

- Microlearning tools such as QOD show that daily reinforcement could be built directly into medical curricula, reducing the tendency for last-minute cramming.
- The gradual rise in usage suggests that digital platforms can promote distributed learning, which is more effective than massed study sessions.

- Tools like MedVerse and Clinical Corner can supplement gaps in traditional teaching, particularly where cadaver labs or patient interactions are limited.
- Strong monthly retention (>85%) highlights that students stay engaged when platforms combine variety, personalization, and microlearning.

Theoretical Links

Patterns from the study can be connected to established learning theories:

- Students adjusted their effort across the semester, particularly in exam months.
- FARRE and QOD supported retrieval practice, strengthening recall.
- Clinical Corner reinforced learning by applying theory to practical cases.

PW MedEd therefore functions not just as a digital aid but as an applied example of these educational frameworks.

Limitations and Future Scope

This study relied mainly on quantitative backend analytics, leaving out qualitative insights such as student motivations or perceptions. Future work should combine data logs with surveys or interviews for a fuller picture. A year-long study would also capture seasonal trends such as holidays and extended clinical postings.

Further development could include adaptive AI features—for example, suggesting FARRE modules when engagement dips, or tailoring QOD difficulty to prior performance. Such steps could turn PW MedEd into a proactive mentor rather than a static resource.

Recommendations

The present study offers several actionable recommendations for improving digital learning experiences on PW MedEd and similar medical education platforms. These recommendations are based on real-time usage patterns of nearly 3,000 MBBS students over six months and reflect the diverse needs of learners across different phases of their academic journey.

Strengthen Year-Round Engagement, Not Just Exam-Phase Peaks

The findings indicated that both watch time and feature utilization increased steadily from January to May, but experienced a decline in June following the conclusion of exams. This implies that numerous students still connect digital tools primarily with "exam preparation" rather than consistent learning throughout the year. Implement weekly challenges, rewards for maintaining streaks, or structured study schedules to promote ongoing learning during the semester. For instance, introducing a "15-minute daily streak" through FARRE or QOD can help distribute learning more evenly across the semester instead of concentrating it before exams.

Expand Rapid Revision Tools (FARRE) for Exam Preparation

The utilization of FARRE nearly doubled during the exam period, establishing it as the preferred feature for quick revision. It is evident that students appreciate organized, high-yield notes when time is limited. Expanding FARRE modules to include additional subjects and exam-specific topics would be beneficial. Creating timed revision playlists (such as "Revise Pathology in 3 Hours") could also assist students requiring concentrated preparation in high-stress situations.

Encourage Conceptual Learning Early Through MedVerse

MedVerse demonstrated consistent usage (approximately 450–470 students each month) throughout the study, highlighting its function as a tool for conceptual visualization rather than just a resource for exam preparation. It would be beneficial to promote MedVerse more intensively during the initial half of the semester to reinforce foundational knowledge. Connecting MedVerse modules with lecture timetables (for example, Anatomy class followed by a MedVerse 3D demonstration) could integrate it into everyday classroom activities.

Expand Clinical Corner Beyond Exam Season

Clinical Corner participation increased by 75% by June, mainly because final-year students utilized it for viva and practical exam preparation. Nevertheless, its capability for enhancing clinical reasoning goes beyond just exam periods. Incorporate Clinical Corner cases throughout the academic year, rather than limiting them to exam season. Implementing weekly "mini-clinical challenges" could assist students in progressively developing their diagnostic reasoning abilities, thereby alleviating the pressure of cramming at the last minute.

Leverage Microlearning for Habit Formation (QOD Success)

QOD achieved the highest level of consistent engagement, boasting more than 1,200 users each day. This indicates that short, concise activities are both sustainable and impactful.

Extend the microlearning strategy beyond QOD. Daily flashcards, image-based recall exercises, or quick quizzes that connect with current lectures could support continuous learning. Push notifications might encourage students to engage in 5–10 minutes of daily practice.

Tailor Interventions for Different Engagement Segments

The analysis revealed that 48% of students were classified as high or very high engagement users, whereas 18% were categorized as low engagement users. For low engagement users: Introducing onboarding tutorials, implementing gamified milestones, or establishing mentor-led study groups could enhance user adoption. For moderate engagement users: Tailored study plans and AI-based reminders might help elevate them to higher engagement levels. For high engagement users: Providing advanced features such as adaptive QBank challenges can further enrich their learning experience. For very high engagement users: It's beneficial to offer "wellness breaks" or organized study-rest cycles to avoid burnout.

Blend Platform Use with Offline Curriculum

Findings showed that students use different features at different times (MedVerse for concepts, FARRE for revision, Clinical Corner for viva, QOD for reinforcement). This naturally complements offline teaching.

Collaborate with faculty to align PW MedEd features with the college timetable. Example: Anatomy classes could be followed by MedVerse modules, while final-year postings could be paired with Clinical Corner cases. This blended model will normalize digital learning as part of the curriculum, not just a personal add-on.

Focus on Learning Outcomes Beyond Watch Time

The research mainly assessed engagement through metrics like watch hours, Daily Active Users (DAU)/Monthly Active Users (MAU), and feature utilization, but genuine academic achievement is reflected in enhanced comprehension and exam outcomes. Future analyses ought to connect platform engagement with test scores, internal assessments, and mastery of subjects. This approach would enable educators to gauge not only the duration of students' studying but also the efficacy of their learning.

Extend Research and Feedback Loops

This research spanned six months and clearly illustrated the changes between semesters and exams. Nevertheless, extended observation is required to fully understand the entire academic cycles. It is essential to conduct studies that last a year to monitor seasonal variations (such as breaks, postings, and final exams). Furthermore, consistent feedback surveys from students can help inform immediate enhancements in content, usability, and design features.

Increase Faculty Involvement and Endorsement

One factor contributing to high retention rates (MAU >85%) could be students' confidence in the platform's applicability. This confidence can be enhanced if instructors actively assist students in navigating the appropriate features at the right moments. Organize "PW MedEd integration workshops" led by faculty, where they showcase how to utilize FARRE, QOD, or Clinical Corner for particular topics.

Conclusion

This study investigated how PW MedEd's AI-enhanced microlearning tools influenced the studying habits of 2,969 MBBS students from January to June 2025. The results indicate that digital resources are increasingly becoming a core component of medical education rather than just supplementary aids.

Overall participation displayed a significant increase, with the average viewing time jumping from 8–10 hours per month in January and February to almost 18 hours by May. There was a 20% rise in daily active users, and monthly retention rates stayed above 85%, reflecting the platform's strong dependability. These trends illustrate a transition from sporadic conceptual study at the semester's start to methodical, exam-focused learning as assessments approached.

In terms of specific features, students exhibited intentional usage patterns. FARRE experienced a sharp increase in use during exam periods, highlighting its effectiveness as a quick revision tool. Meanwhile, MedVerse sustained consistent usage throughout the semester, illustrating its importance for understanding core concepts in Anatomy and Pathology. Clinical Corner gained popularity from May to June, particularly for preparing for vivas and practicals, whereas the Question of the Day (QOD) maintained the highest daily engagement (1,200–1,400 users), showcasing the efficacy of microlearning in developing study habits. Collectively, these features established a supportive ecosystem that bolstered both comprehension and performance.

Segmentation analysis further revealed a diversity among learners. While 18% were categorized as low-engagement users, nearly half (48%) were classified into high and very high engagement groups, emphasizing that digital platforms are becoming primary study tools for a significant number of students.

In summary, this study emphasizes that PW MedEd has effectively adapted to the changing study habits of MBBS students by providing a well-rounded mix of conceptual understanding, daily practice, and focused exam preparation. The platform's multi-faceted structure—featuring resources like MedVerse for foundational knowledge, FARRE for quick reviews, Clinical Corner for practical application, and QOD for ongoing microlearning—ensured that students stayed engaged throughout various stages of the semester. Notably, the continuous increase in watch time, high rates of daily and monthly user engagement, and the

strong presence of highly engaged learners indicate that PW MedEd has progressed from being merely a supplementary resource to becoming an essential academic ally. By fostering regular usage instead of last-minute studying, the platform has promoted healthier study practices and contributed to enhanced academic preparedness. Looking ahead, deeper integration into formal medical education, along with tailored personalization and faculty participation, could further amplify its impact. Ultimately, such digital platforms offer vast potential to cultivate a new generation of self-directed, resilient, and proficient doctors ready to meet the challenges of contemporary healthcare.

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