

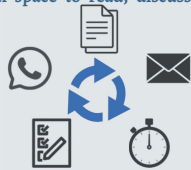
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Problem & Motivation

- **Academic Collaboration is Fragmented**
 - Juggling multiple disconnected tools (PDF readers, chat apps, notes)
- **Discussions lose focus**
 - Hard to track who said what, and when
- **Participation is unequal**
 - Some voices dominate while others stay silent
- **No unified platform for group paper reading**
 - Teams lack a central space to read, discuss, and learn together



Why It Matters?

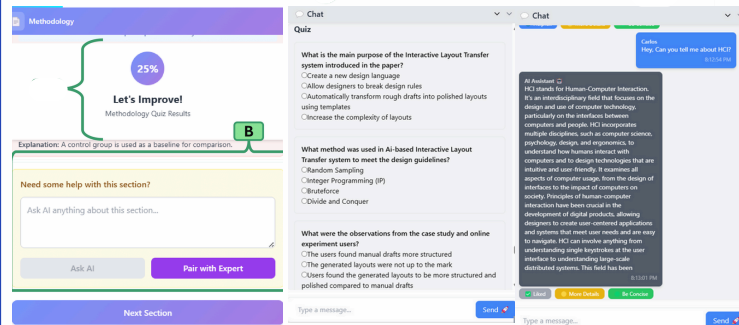
- **Saves time**
 - No need to switch between apps or manually summarize, everything's in one place
- **Collaboration boosts understanding**
 - Discussing with peers and seeing diverse viewpoints deepens comprehension
- **AI support enhances learning efficiency**
- **Combines human insight with AI scalability**
 - Enables both rich discussions and rapid information access (A)
- **Fosters equitable engagement**

How It Works?

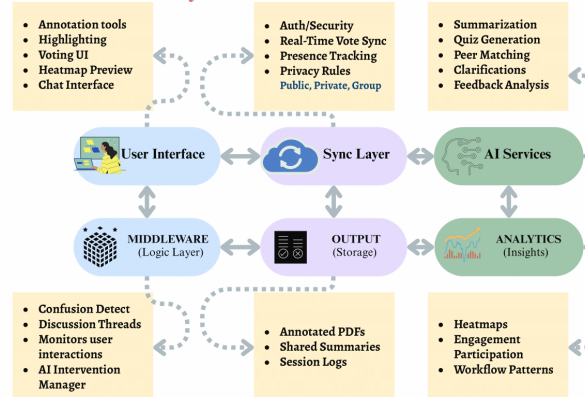
- **Upload & Sync**
 - Teams upload papers to a shared workspace
 - Live collaboration: See others' edits instantly
- **Annotate Together**
 - Highlight and comment simultaneously (D)
 - Color-coded by user with threaded discussions
- **AI-Powered Insights**
 - Smart Help: Answers questions using the paper's content
- **Peer Support (B)**
 - Pair users for help based on:
 - Expertise
 - Current reading progress

What is PaperPal?

An all-in-one platform combining real-time annotation, AI summaries, quizzes, and chat to streamline group paper reading.



System Architecture



Smart Group Annotations

AI organizes team insights

- **Consensus Validation**
 - AI verifies annotations against the source text using RAG
 - Identifies conflicting interpretations among users
- **Collaborative Summary Generation**
 - Synthesizes multiple perspectives into unified insights
- **Engagement Visualization Through Heatmap**
 - Annotation density per section
 - Discussion intensity

Challenges

- **Real-Time PDF Syncing**
 - Ensuring all users see the same view and updates instantly
- **Group-Aware AI Responses**
 - AI must consider multiple users' questions, roles, and context
- **Overlapping Annotations**
 - Multiple users annotating the same section can create clutter
- **Managing AI-Human Interaction Dynamics**
 - Balancing AI input without disrupting human discussion flow

Future Work

- **Interviews & User Studies**
- **Explore implicit AI support**
- **Boost Collaboration**
- **Hallucination Mitigation**
- **Cross-Domain Adaptation**

Conclusion

- PaperPal reimagines collaborative reading by unifying real-time annotations, AI explanations, and structured discussion
- AI-powered summaries dynamically adapt to the evolving needs of the group
- Smart highlighting identifies and surfaces the team's collective focus areas
- AI-guided workflows help keep teams aligned and productive throughout the reading process