

PaperPal: An AI-Powered Platform for Collaborative Reading and Discussion



User Experience and Interaction Design Lab

& Data Mining Lab





Sakil Sarker¹, Carlos Carrasco Garcia², Patrick Hung², Heidar Davoudi¹, Ali Neshati¹

sakil.sarker@ontariotechu.net, carlos.carrascogarca@ontariotechu.net, patrick.hung@ontariotechu.ca, heidar.davoudi@ontariotechu.ca, ali.neshati@ontariotechu.ca
¹Department of Science, Ontario Tech University; ²Department of Business and Information Technology, Ontario Tech University

Problem & Motivation

- Collaborative research paper reading is often fragmented across tools, and they are not designed for group learning.
- Researchers often struggle and find it really hard to stay synchronized during group reading sessions.
- Current AI tools lack integration and contextual awareness, which is needed for effective academic collaboration.

Objectives

- Fascilitate collaborative research paper reading using annotation, AI-powered summarization, and discussion tools.
- Enhance group understanding and engagement through context-aware AI support and real-time interaction.

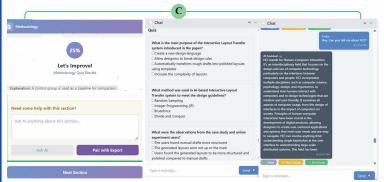
How It Works?

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

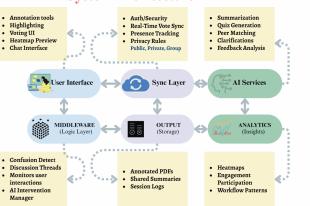
What is PaperPal?

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





System Architecture



Features

- (A) Tunable AI Summaries
 - Easily switch between short summaries and detailed explanations, while AI highlights the main ideas, key contributions, and methods of the paper
- Smart Help from AI or the Right Peer
 - Receive instant AI support through on-the-spot clarifications and smart help suggestions when the system detects you're facing difficulties
 - Collaborate with peers who have expertise in the topic, encouraging peer-led learning alongside AI assistance
- (B) Intelligent Annotation Insights
 - AI helps analyze your annotations in real time to highlight important patterns, main ideas, and group contributions.
- (C) Intelligent Support
 - Get clear, personalized explanations when needed, and use <u>AI-generated quizzes</u> to strengthen understanding and recall of key concepts
 - The system detects when you're struggling and suggests personalized support
 - Connect with knowledgeable peers for collaborative learning, diverse perspectives, and active peer teaching alongside AI guidance
 - Combines real-time AI responses with rich peer interaction for a holistic learning experience
 - AI and peers respond instantly to your questions, keeping study sessions interactive and engaging

Conclusion

- PaperPal promotes deeper understanding and inclusive collaboration in academic reading groups.
- Our system enhances research discussions by integrating AI-driven insights and group dynamics in one platform.
- By aligning individual insights and group dynamics, it transforms how research is read, discussed, and learned.