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EduConnect: AI-Enabled Personalized Peer Learning Frameworks in Higher Education Documentation

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1: System Overview

EduConnect is a comprehensive study partner platform designed to help students find compatible study partners, track their study progress, access learning resources and join study groups based on shared interests. The system uses intelligent matching algorithms to connect students with similar academic interests, skills and learning preferences.

Key Objectives

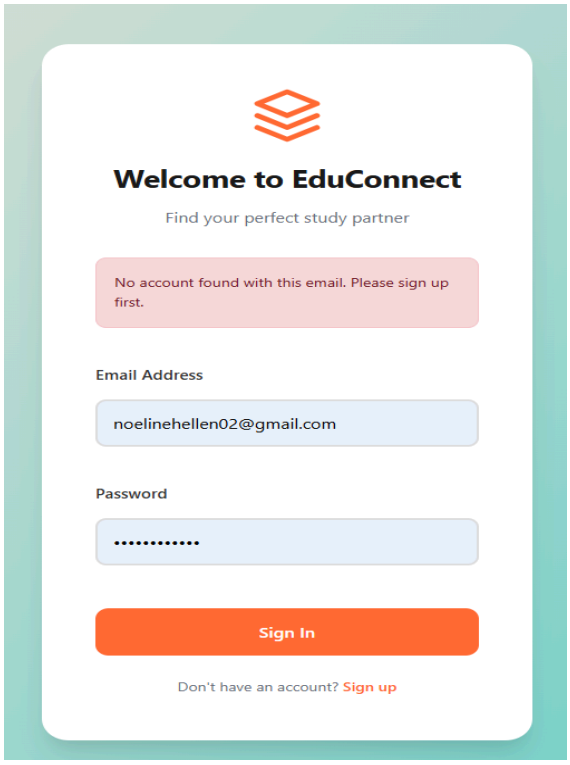
- Connect students with compatible study partners
- Track and visualize study progress
- Provide curated learning resources
- Create study groups based on interests
- Enable feedback and communication

2. Key Features

EduConnect offers a fully integrated suite of features that work together to improve the student learning experience.

2.1 User Authentication and Profile Management

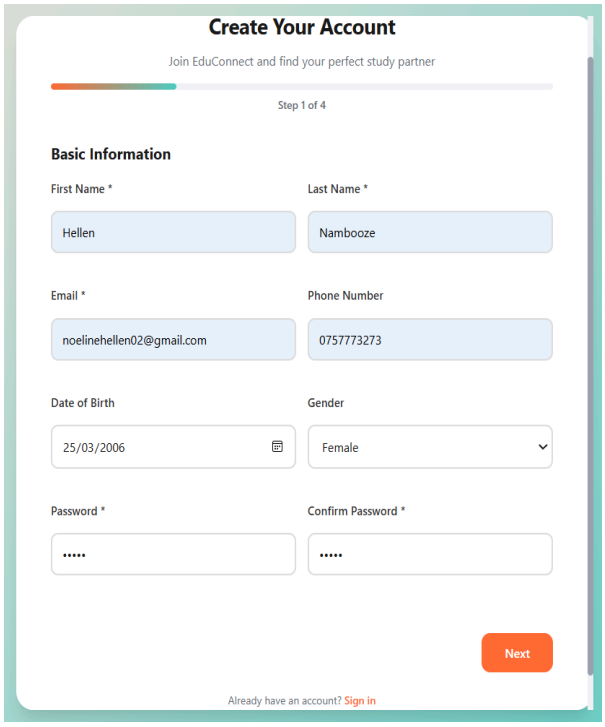
The registration and login system is designed to capture comprehensive information about each user in order to provide meaningful recommendations and customized study insights.

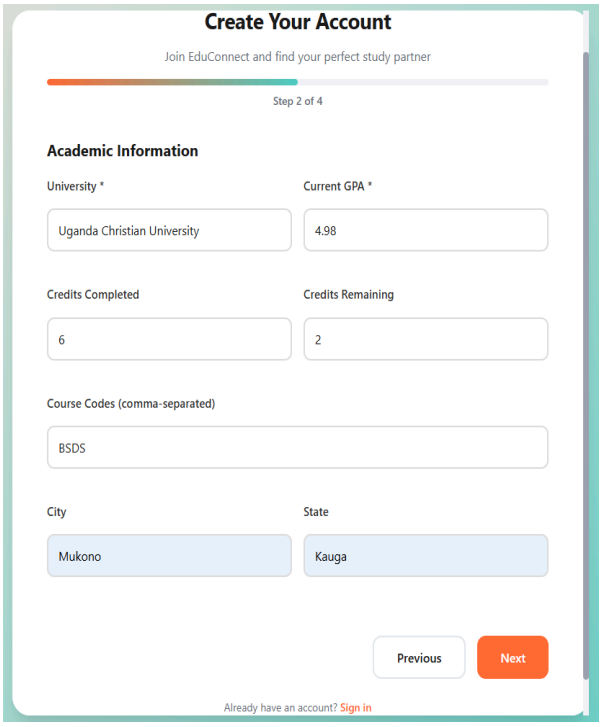


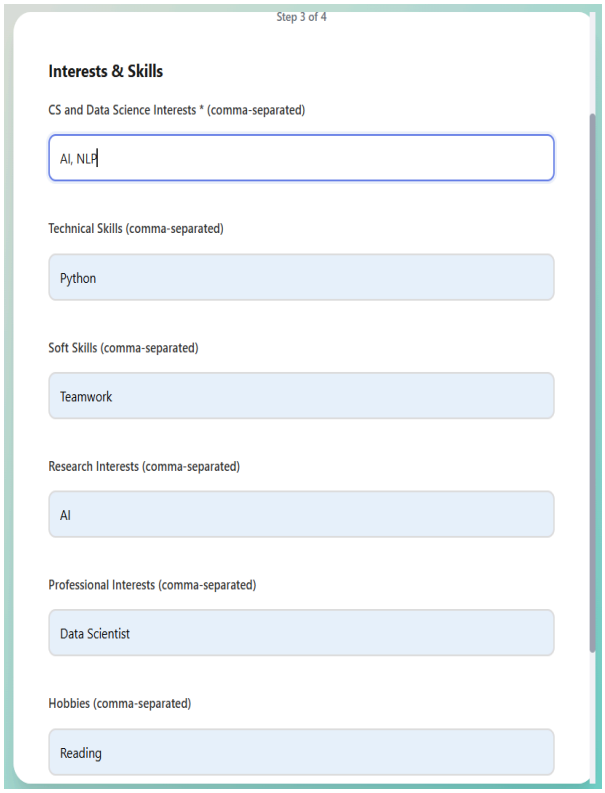
❖ Sign Up Process

The platform uses a multi-stage sign-up process:

- **Basic Information:** First name, last name, email, password, gender, date of birth, and contact details.
- **Academic Information:** Current university, GPA, year of study, and relevant course details.
- **Skills and Interests:** CS and Data Science interests, technical skills (e.g., Python, ML), soft skills (e.g., teamwork, communication), research areas, and hobbies.
- **Study Preferences:** Learning style (visual, auditory, etc.), preferred study hours, study partner preferences, and personal bio.



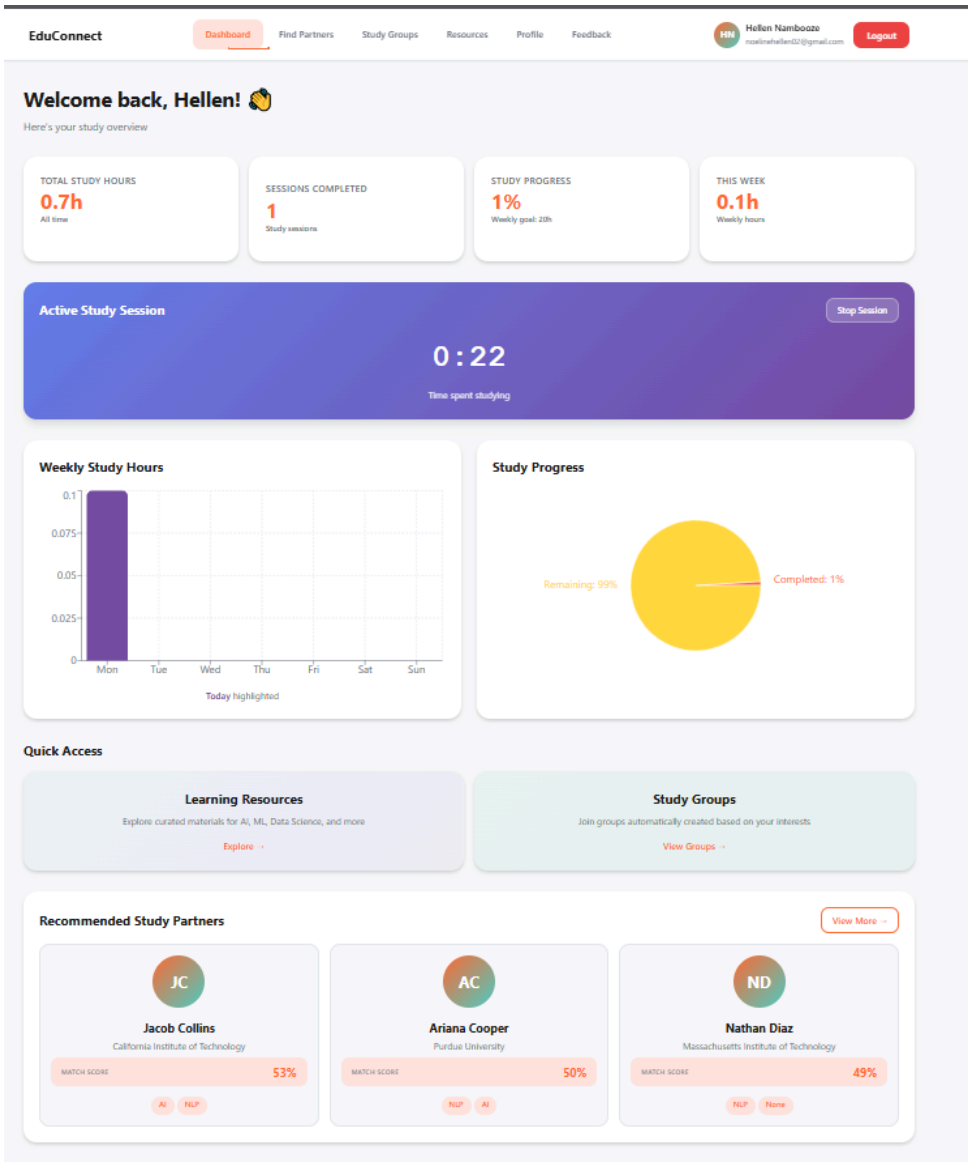




After sign-up, students are taken to the dashboard and they can also edit any part of their profile to keep their academic and personal information updated.

The dashboard summarizes essential academic insights including:

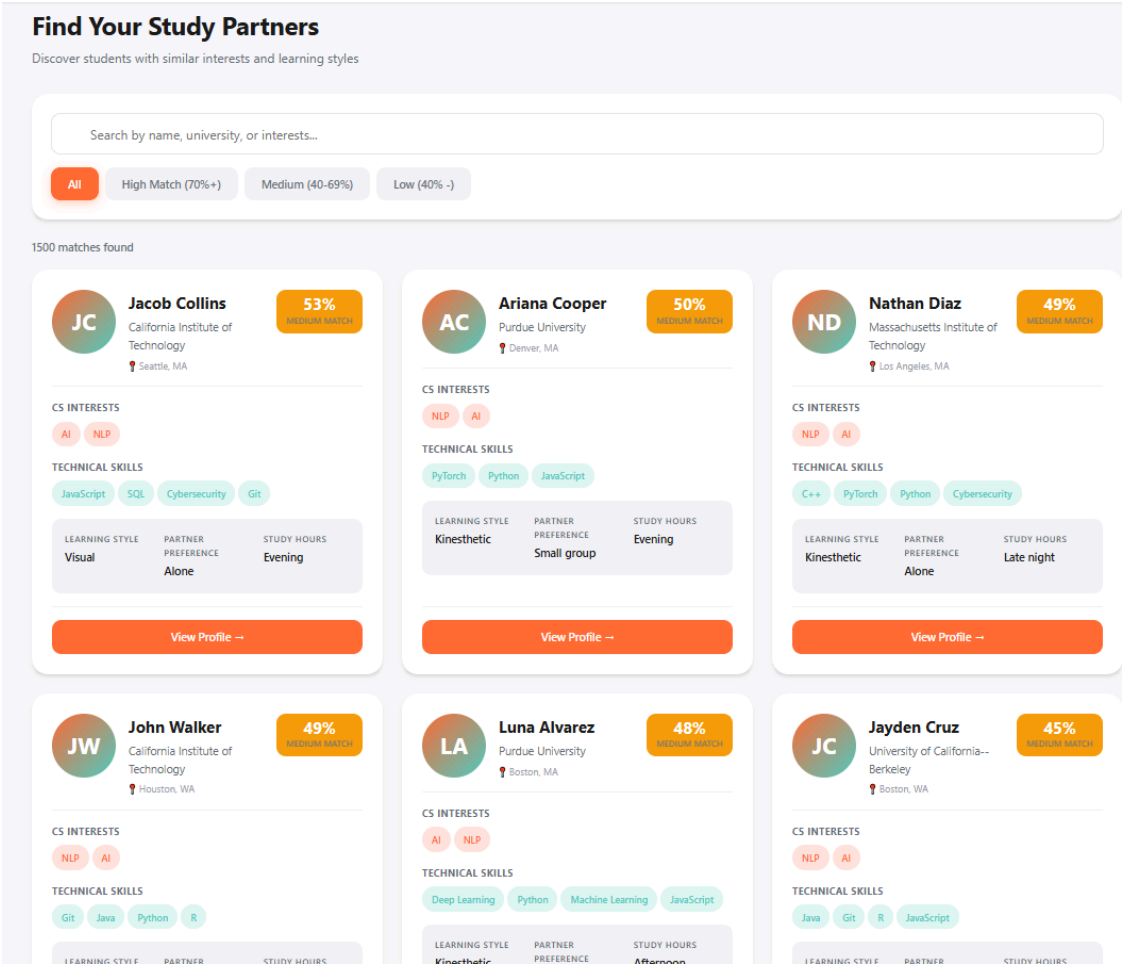
- Total study hours
- Weekly hours graph
- Study progress percentage
- Recommended partners
- Quick access to resources and groups



2.2 Smart Recommendation System

The recommendation engine uses weighted Jaccard similarity to compute match scores between students. Attributes are assigned importance levels:

- CS/Data Science interests — **40%**
- Technical skills — **15%**
- Soft skills — **10%**
- Research interests — **10%**
- Professional interests — **10%**
- Hobbies — **5%**
- Learning style — **5%**
- Partner preferences — **3%**
- Preferred study hours — **2%**



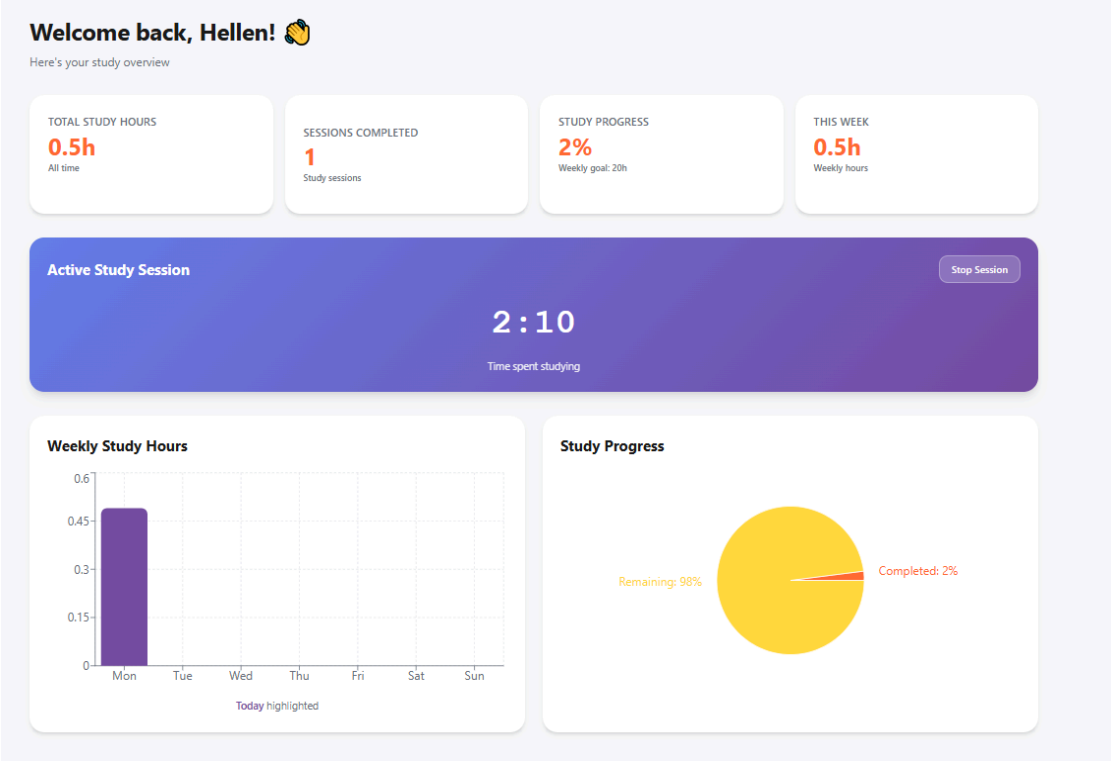
The system returns a ranked list of study partners with compatibility percentages. Filters and search tools allow students to refine their recommendations.

Users can browse recommended study partners, view match scores, filter based on attributes, and open detailed profiles.

2.3 Study Tracking and Analytics

EduConnect includes a built-in productivity tracker that automatically records a student's study activity while logged in. It offers:

- Automatic session recording every 5 minutes
- Manual session logging
- Weekly progress analytics
- Charts for total hours, weekly distribution, and session completions
- A progress goal of 20 hours per week



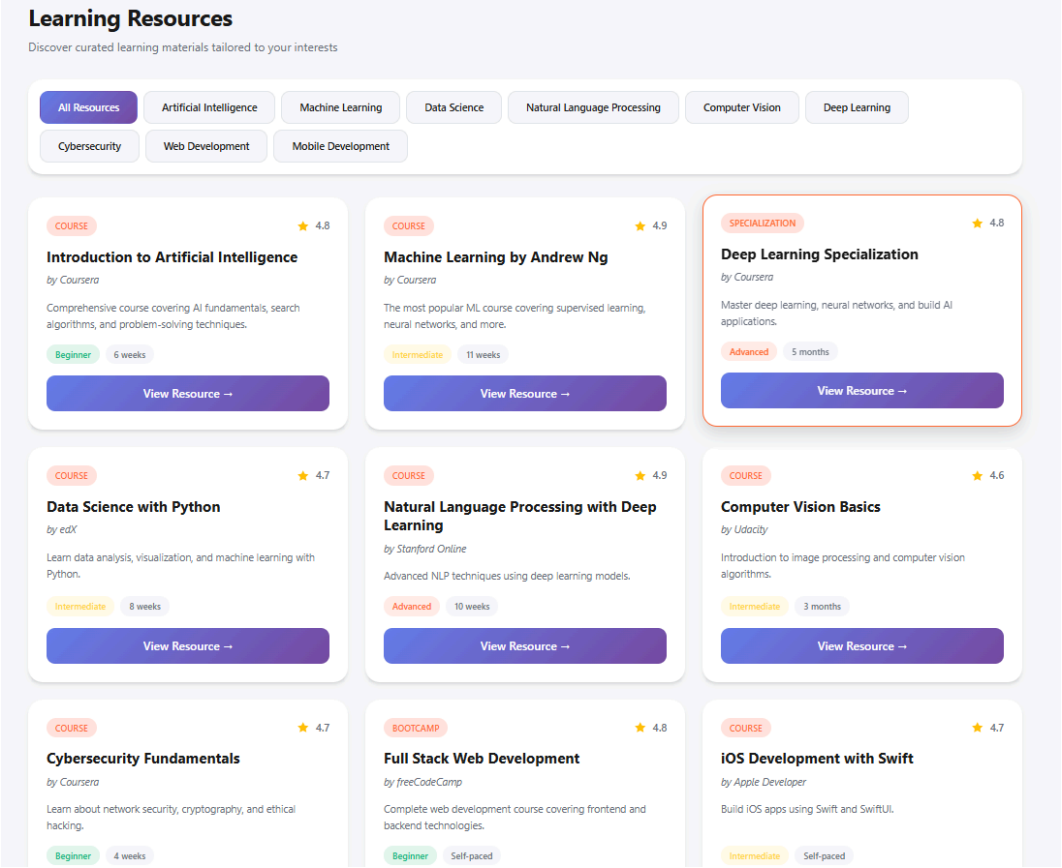
These insights help students understand their study patterns and maintain consistency by automatically logging hours and sessions in the background while the student is active. Students can also manually record study hours using the session timer.

2.4 Learning Resources

The learning resources section curates high-quality materials across fields such as AI, Machine Learning, Data Science, NLP, Cybersecurity, Web Development and more. Each resource includes:

- Title and provider
- Description
- Difficulty level

- Duration
- Rating
- Direct access link

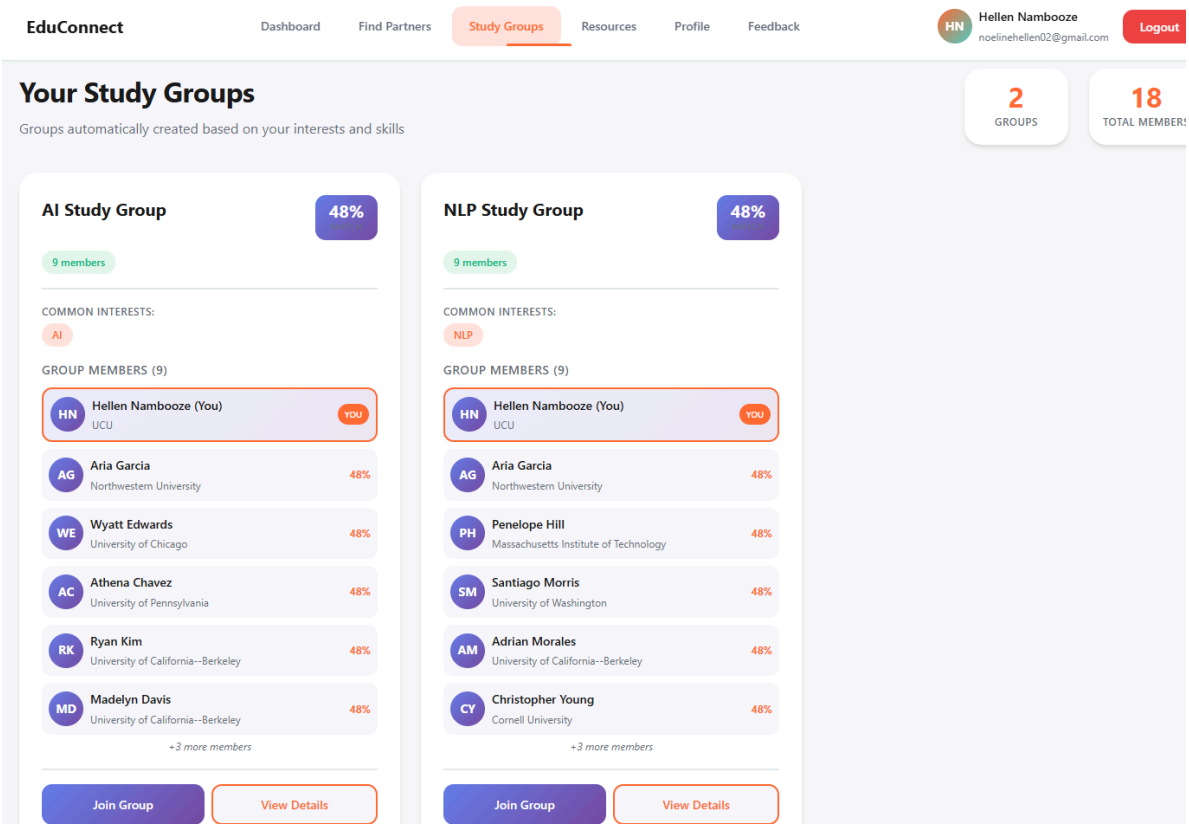


This transforms EduConnect into both a social and academic support platform where learning materials are organized by category, allowing students to quickly access relevant study content.

2.5 Study Groups

Study groups are auto-generated based on shared CS and Data Science interests. For each interest, the system identifies compatible students (minimum 30% match) and forms collaborative groups. Group cards display:

- Group name
- Members
- Match scores
- Shared interests
- Group size and overview

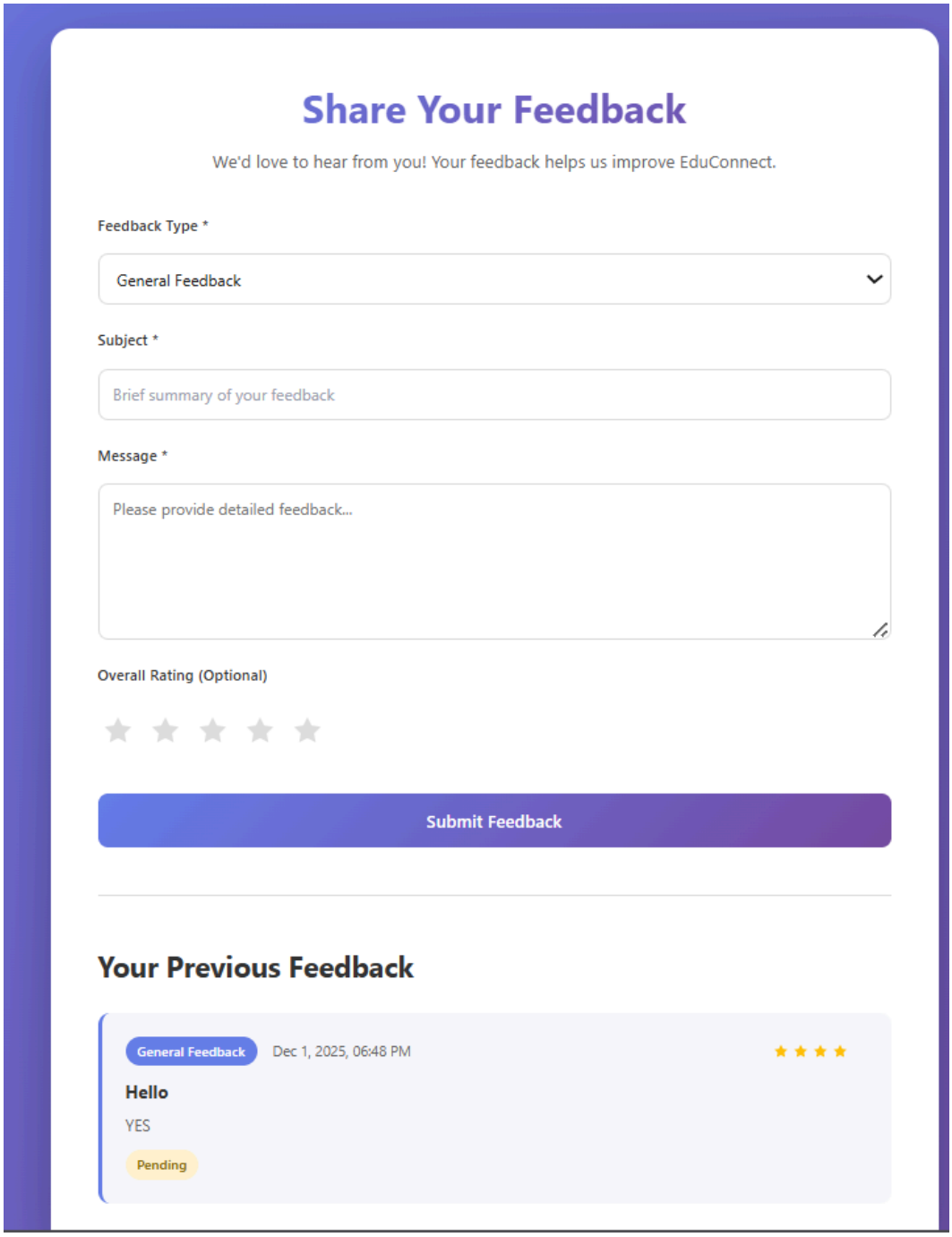


Students can join interest-based groups generated automatically by the system. Each group displays members and shared interests.

2.6 Feedback System

Students can submit feedback categorized as bug reports, feature requests, general feedback, or suggestions. Each submission is stored with a status label (Pending, Reviewed, Resolved).

Feedback submission is accessible from the navigation menu. Students can track their past submissions through the feedback history section.



3.Technical Implementation

3.1 Authentication System

All user data is stored in localStorage under:

- `EduConnect_user`

- `EduConnect_users`
- `EduConnect_feedback`

The authentication context manages login, logout, sign-up, session tracking, and profile updates.

3.2 Recommendation Engine

The matching logic calculates similarity based on weighted attributes using Jaccard similarity. It returns a sorted list of potential partners with scores.

3.3 Dataset Loader

The dataset loader parses the CSV dataset, formats it into user objects and caches it for performance.

3.4 Study Tracking Logic

- Session time is computed using timestamps
- Weekly resets occur every Monday
- Progress is capped at 100%

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4. Troubleshooting and Enhancements

Common Issues

- Login errors due to incorrect email spelling
- Study stats not updating if localStorage is disabled
- Empty recommendations if user has insufficient interests

Future Enhancements

- Real-time chat system
- Database integration
- Advanced performance analytics
- Mobile application version
- Achievement and gamification system