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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

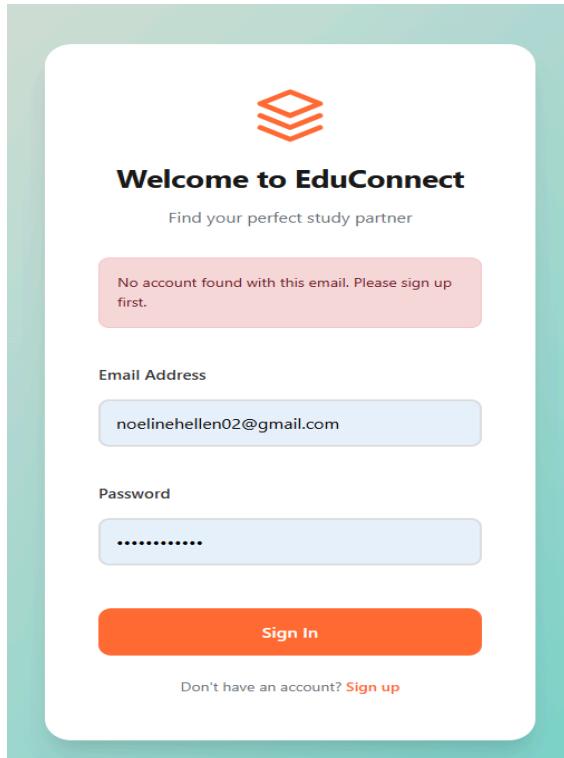
- Connect students with compatible study partners
- Track and visualize study progress
- Provide curated learning resources
- Create study groups based on interests
- Enable feedback and communication

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.

Create Your Account

Join EduConnect and find your perfect study partner

Step 1 of 4

Basic Information

First Name *	Last Name *
Hellen	Nambooze
Email *	Phone Number
noelinehellen02@gmail.com	0757773273
Date of Birth	Gender
25/03/2006	Female
Password *	Confirm Password *
.....

[Next](#)

Already have an account? [Sign in](#)

Create Your Account

Join EduConnect and find your perfect study partner

Step 2 of 4

Academic Information

University *	Current GPA *
Uganda Christian University	4.98
Credits Completed	Credits Remaining
6	2
Course Codes (comma-separated)	
BDS	
City	State
Mukono	Kauga

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Already have an account? [Sign in](#)

Step 3 of 4

Interests & Skills

CS and Data Science Interests * (comma-separated)

Technical Skills (comma-separated)

Soft Skills (comma-separated)

Research Interests (comma-separated)

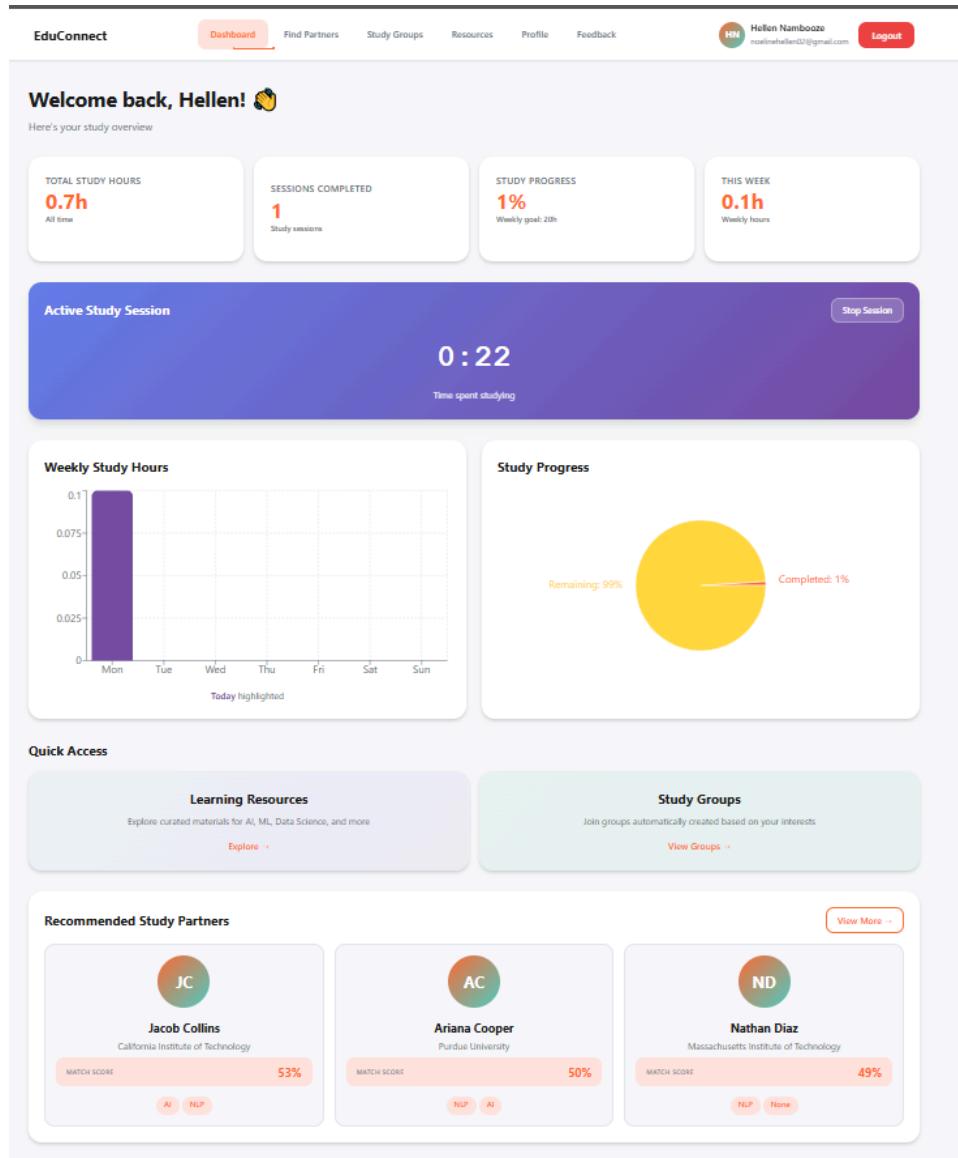
Professional Interests (comma-separated)

Hobbies (comma-separated)

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%**

Find Your Study Partners

Discover students with similar interests and learning styles

All
High Match (70%+)
Medium (40-69%)
Low (40% -)

1500 matches found

 **Jacob Collins**
California Institute of Technology
📍 Seattle, MA

53%
MEDIUM MATCH

CS INTERESTS
AI NLP

TECHNICAL SKILLS
JavaScript SQL Cybersecurity Git

LEARNING STYLE	PARTNER PREFERENCE	STUDY HOURS
Visual	Alone	Evening

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 **Ariana Cooper**
Purdue University
📍 Denver, MA

50%
MEDIUM MATCH

CS INTERESTS
NLP AI

TECHNICAL SKILLS
PyTorch Python JavaScript

LEARNING STYLE	PARTNER PREFERENCE	STUDY HOURS
Kinesthetic	Small group	Evening

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 **Nathan Diaz**
Massachusetts Institute of Technology
📍 Los Angeles, MA

49%
MEDIUM MATCH

CS INTERESTS
NLP AI

TECHNICAL SKILLS
C++ PyTorch Python Cybersecurity

LEARNING STYLE	PARTNER PREFERENCE	STUDY HOURS
Kinesthetic	Alone	Late night

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 **John Walker**
California Institute of Technology
📍 Houston, WA

49%
MEDIUM MATCH

CS INTERESTS
NLP AI

TECHNICAL SKILLS
Git Java Python R

LEARNING STYLE	PARTNER	STUDY HOURS
Kinesthetic	Alone	Afternoon

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 **Luna Alvarez**
Purdue University
📍 Boston, MA

48%
MEDIUM MATCH

CS INTERESTS
AI NLP

TECHNICAL SKILLS
Deep Learning Python Machine Learning JavaScript

LEARNING STYLE	PARTNER PREFERENCE	STUDY HOURS
Kinesthetic	Alone	Afternoon

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 **Jayden Cruz**
University of California-Berkeley
📍 Boston, WA

45%
MEDIUM MATCH

CS INTERESTS
NLP AI

TECHNICAL SKILLS
Java Git R JavaScript

LEARNING STYLE	PARTNER	STUDY HOURS
Kinesthetic	Alone	Afternoon

[View Profile →](#)

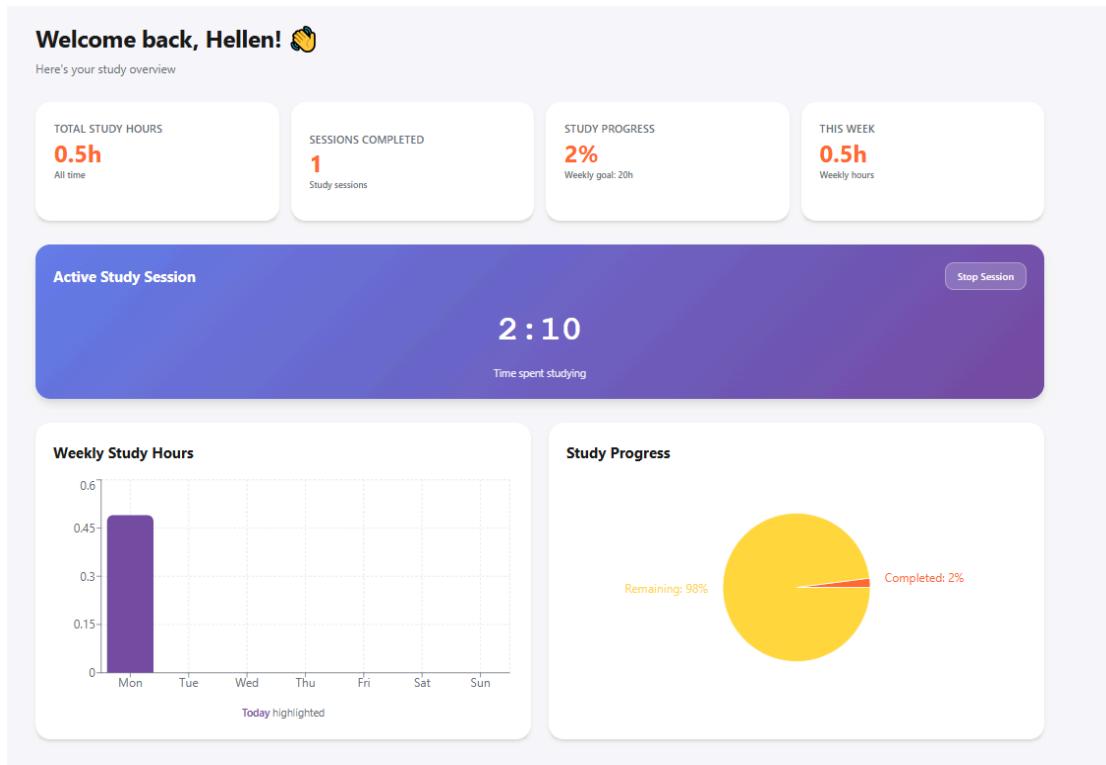
The system returns a ranked list of study partners with compatibility percentages. Filters and search tools allow students to refine their recommendations.

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

Learning Resources

Discover curated learning materials tailored to your interests

Category	Title	Provider	Rating	Description	Level	Duration	Action
COURSE	Introduction to Artificial Intelligence	Coursera	4.8	Comprehensive course covering AI fundamentals, search algorithms, and problem-solving techniques.	Beginner	6 weeks	View Resource →
COURSE	Machine Learning by Andrew Ng	Coursera	4.9	The most popular ML course covering supervised learning, neural networks, and more.	Intermediate	11 weeks	View Resource →
SPECIALIZATION	Deep Learning Specialization	Coursera	4.8	Master deep learning, neural networks, and build AI applications.	Advanced	5 months	View Resource →
COURSE	Data Science with Python	edX	4.7	Learn data analysis, visualization, and machine learning with Python.	Intermediate	8 weeks	View Resource →
COURSE	Natural Language Processing with Deep Learning	Stanford Online	4.9	Advanced NLP techniques using deep learning models.	Advanced	10 weeks	View Resource →
COURSE	Computer Vision Basics	Udacity	4.6	Introduction to image processing and computer vision algorithms.	Intermediate	3 months	View Resource →
COURSE	Cybersecurity Fundamentals	Coursera	4.7	Learn about network security, cryptography, and ethical hacking.	Beginner	4 weeks	View Resource →
BOOTCAMP	Full Stack Web Development	freeCodeCamp	4.8	Complete web development course covering frontend and backend technologies.	Beginner	Self-paced	View Resource →
COURSE	iOS Development with Swift	Apple Developer	4.7	Build iOS apps using Swift and SwiftUI.	Intermediate	Self-paced	View Resource →

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

The screenshot shows the EduConnect platform interface. At the top, there is a navigation bar with links: Dashboard, Find Partners, Study Groups (which is the active tab), Resources, Profile, and Feedback. On the right side, there is a user profile for Hellen Nambooze (noelinehellen02@gmail.com) with a Logout button. Below the navigation bar, there is a section titled "Your Study Groups" which says "Groups automatically created based on your interests and skills". There are two main cards displayed:

- AI Study Group**: Shared interest: AI. 48% completion. 9 members. Group members include Hellen Nambooze (You) from UCU, Aria Garcia from Northwestern University, Wyatt Edwards from University of Chicago, Athena Chavez from University of Pennsylvania, Ryan Kim from University of California-Berkeley, and Madelyn Davis from University of California-Berkeley. There are "+3 more members". Buttons: Join Group (blue) and View Details (orange).
- NLP Study Group**: Shared interest: NLP. 48% completion. 9 members. Group members include Hellen Nambooze (You) from UCU, Aria Garcia from Northwestern University, Penelope Hill from Massachusetts Institute of Technology, Santiago Morris from University of Washington, Adrian Morales from University of California-Berkeley, and Christopher Young from Cornell University. There are "+3 more members". Buttons: Join Group (blue) and View Details (orange).

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.

Share Your Feedback

We'd love to hear from you! Your feedback helps us improve EduConnect.

Feedback Type *

General Feedback



Subject *

Brief summary of your feedback

Message *

Please provide detailed feedback...



Overall Rating (Optional)



Submit Feedback

Your Previous Feedback

General Feedback

Dec 1, 2025, 06:48 PM

★★★★★

Hello

YES

Pending

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%
-

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

