Skill Bridge

An AI-Based Collaborative Learning and Skill Exchange Platform

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***Abstract*—** Skill development and practical learning have become essential requirements in the modern educational and professional environment. Traditional learning systems mainly focus on theoretical education and often lack collaborative learning, personalized guidance, and practical skill-sharing opportunities. Existing e-learning platforms provide online courses and certifications but offer limited peer interaction, mentorship support, and real-time collaborative experiences.

***Keywords*—** *Collaborative Learning; Peer-to-Peer Learning; Skill Exchange; Artificial Intelligence; Recommendation System; Educational Technology; Skill Development; E-Learning Platform; Learning Analytics; Mentorship System*

I. INTRODUCTION

In the modern digital era, skill development has become one of the most important factors for improving employability, career growth, and professional success. Traditional education systems mainly focus on theoretical knowledge and academic performance, while industries increasingly demand practical skills, collaboration, and real-world experience. As a result, many students and learners face difficulties in identifying relevant skills, accessing quality mentorship, and gaining hands-on learning opportunities.

Existing online learning platforms mainly provide prerecorded courses and certification programs with limited interaction and personalization. These systems often lack peer-to-peer collaboration, intelligent skill recommendations, and real-time mentorship support.

To overcome these limitations, the proposed "Skill Bridge" system introduces an AI-based collaborative learning and skill exchange platform that enables users to both learn and teach skills through peer interaction. The platform creates a community-driven ecosystem where learners can connect with mentors, schedule sessions, exchange knowledge, and track their learning progress efficiently.

Skill Bridge integrates intelligent recommendation systems, credit-based learning models, session scheduling, mentorship support, and feedback mechanisms to improve personalized learning experiences. The system aims to bridge the gap between academic learning and industry requirements by creating an interactive and scalable learning environment.

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II. EXISTING SYSTEM

Existing e-learning platforms primarily focus on video-based course delivery, quizzes, and certification systems. These platforms provide accessibility to learning resources but lack collaborative learning and personalized mentorship features.

Limitations of Existing Systems

- Limited peer-to-peer interaction
- Lack of practical collaborative learning
- Weak mentorship support
- No effective credit-based knowledge-sharing mechanism
- Limited personalized recommendations
- Low engagement in self-paced learning

These limitations reduce learning effectiveness and fail to create a collaborative ecosystem for continuous skill development.

III. PROPOSED SYSTEM

Before The proposed Skill Bridge platform provides an AI-based collaborative learning and skill exchange ecosystem where users can both learn and teach skills.

Features of Proposed System

- AI-Based Skill Recommendation
- Peer-to-Peer Learning
- Credit-Based Skill Exchange
- Session Scheduling
- Mentorship Support
- Progress Tracking
- Feedback and Rating System

The platform encourages collaborative learning, improves practical skill development, and enhances employability through community-driven education.

IV. METHODOLOGY

A. Requirement Analysis

The first phase involves analyzing the limitations of traditional learning systems and identifying the requirements for an intelligent collaborative learning platform. The analysis focuses on problems such as lack of practical skill-sharing

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opportunities, limited mentorship access, absence of personalized recommendations, and low learner engagement in existing systems.

The proposed system requirements include:

- User registration and authentication
- Skill profile management
- Intelligent recommendation system
- Peer-to-peer collaboration
- Session scheduling
- Credit-based learning mechanism
- Progress tracking and feedback system

Both functional and non-functional requirements are identified to ensure scalability, usability, security, and system efficiency.

B. System Architecture

The Skill Bridge platform follows a layered architecture consisting of frontend, backend, database, and recommendation modules. Each module performs specific operations to maintain system efficiency and modularity.

Frontend Layer

The frontend is developed using HTML, CSS, and JavaScript to create a responsive and user-friendly interface. The frontend handles:

- User interaction
- Dashboard display
- Skill browsing
- Session booking
- Profile management
- Feedback submission

Responsive design principles are implemented to ensure compatibility across multiple devices.

Backend Layer

The backend manages the core application logic and communication between system modules. It handles:

- Authentication and authorization
- Session management
- Recommendation processing
- Credit calculation
- User activity tracking
- Data validation

The backend ensures secure communication and smooth workflow execution throughout the platform.

Database Layer

The database stores all user-related and system-related information including:

- User profiles
- Skills and interests
- Learning history
- Session details
- Credit transactions
- Feedback and ratings

Efficient database management techniques are used to ensure fast data retrieval and secure storage.

Recommendation Engine

The recommendation engine is one of the core components of the Skill Bridge platform. It analyzes user skills, interests, and learning behavior to generate personalized recommendations.

The recommendation process includes:

- Skill similarity analysis
- User interest matching
- Learning history evaluation
- Peer compatibility analysis
- Market-oriented skill suggestions

This module improves personalization and helps users identify suitable learning opportunities.

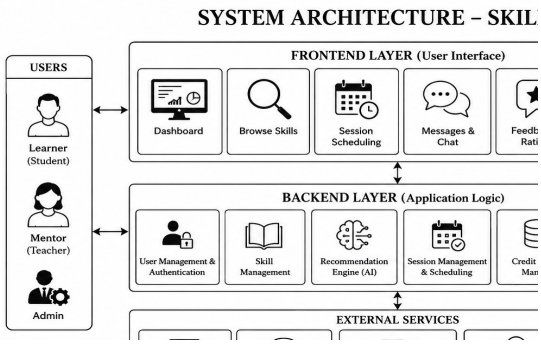
C. Credit Based Learning System

The platform implements a credit-based learning model to maintain engagement and encourage contribution.

Credit Workflow

- Users earn credits by teaching skills.
- Credits can be used to learn new skills.
- The system tracks credit transactions automatically.
- Active contributors receive higher reputation scores.

This mechanism creates a balanced ecosystem where users are motivated to both learn and contribute knowledge.



V. Results And Discussion

The Skill Bridge platform improves learner engagement, collaborative interaction, and practical skill development. The recommendation system provides personalized learning suggestions, while the credit-based model increases active participation and knowledge sharing.

The platform creates a scalable and interactive learning ecosystem that supports continuous learning and career development.

VI. Conclusions

Skill Bridge is an AI-based collaborative learning and skill exchange platform designed to improve practical learning, peer-to-peer interaction, and skill development among students and learners. The system enhances accessibility, personalized learning, mentorship support, and collaborative education while bridging the gap between academic learning and industry-required skills.

The platform provides an effective solution for modern skill-oriented digital learning systems and contributes toward continuous learning and employability enhancement.

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