

# Preplyte: An Integrated AI-Powered Placement Preparation and Simulation Platform for Student and Institutions

<sup>1</sup> Prof. Jayshree Pawar, <sup>2</sup> Swaranjith Satyanarayana Gudelli, <sup>3</sup> Shravan Vijay Chavan, <sup>4</sup> Sarvesh Balasaheb Bhoite

<sup>1,2</sup> Dept. of Information Technology, Vasantdada Patil Pratishthan's College of Engineering and Visual Arts, Sion, Mumbai

<sup>3,4</sup> Dept. of Information Technology Vasantdada Patil Pratishthan's College of Engineering and Visual Arts, Sion, Mumbai

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## ABSTRACT

Campus placement is a critical milestone in a student's academic journey, as it significantly influences their professional future. To address the challenges of fragmented and unstructured placement preparation, this paper presents Preplyte, an AI-powered placement preparation and simulation platform. The platform provides structured training for aptitude assessments, coding evaluations, interview preparation, and soft skill development within a single integrated system. Preplyte offers company-specific preparation processes, personalized practice modules, and continuous feedback to improve student confidence and performance. AI-driven mock interviews are conducted based on student resumes, while an integrated resume builder with ATS scoring helps optimize resumes for real recruitment systems. In addition, the platform enables educational institutions to track student progress, analyze performance, and provide targeted guidance. By combining intelligent automation with realistic placement simulations, Preplyte aims to enhance placement readiness and reduce failure rates in campus recruitment processes.

## INTRODUCTION

Campus placement is a critical phase in a student's academic journey, as it plays a major role in shaping their professional future. However, many students face difficulties during placement preparation due to the use of multiple unconnected platforms for aptitude practice, coding assessments, interview preparation, and resume building. This fragmented approach often leads to unstructured learning, limited feedback, and inadequate exposure to real recruitment processes.

To address these challenges, this paper introduces Preplyte, an integrated AI-powered placement preparation and simulation platform designed to align student preparation with industry expectations. The platform provides structured training for aptitude tests, coding rounds, interview preparation, and soft skill development within a single unified system.

Preplyte offers instant performance feedback, personalized practice modules, and company-specific preparation workflows that enable students to improve efficiency and confidence across multiple attempts. The platform also includes AI-assisted resume building with Applicant Tracking System (ATS) scoring, allowing students to optimize their resumes for real-world hiring systems.

In addition to student-focused features, Preplyte supports educational institutions by providing dashboards and analytics to monitor student progress, identify skill gaps, and guide training efforts effectively. Through intelligent automation and structured feedback, the platform aims to enhance placement readiness and improve overall success rates in campus recruitment.

## RESEARCH GOALS AND OBJECTIVES:

The primary goal of this research is to design and develop an integrated, AI-powered placement preparation platform that supports structured skill development and aligns student training with real-world recruitment processes.

The research aims to leverage artificial intelligence to personalize learning tasks based on individual student profiles and resumes, while also enabling educational institutions to monitor student performance, analyze preparation progress, and provide targeted guidance.

Overall, this research focuses on improving the effectiveness of campus placement drives by introducing a structured, data-driven, and skill-oriented preparation framework that enhances student readiness and placement outcomes.

## RESEARCH OBJECTIVE:

The objectives of this research are as follows:

1. To design and develop an integrated, user-centric placement preparation platform by analysing existing systems and addressing limitations related to fragmentation and lack of integration.
2. To implement AI-based assessment and feedback mechanisms for evaluating student performance in aptitude tests, coding assessments, interviews, and resume analysis.
3. To simulate real-world campus placement processes by modelling company-specific hiring workflows within the platform.
4. To provide analytical dashboards and monitoring tools that enable institutions to track student progress, performance, and training effectiveness.
5. To evaluate the effectiveness of the proposed system in improving student skills, confidence, and overall placement readiness.

## Problem Statement

Campus placement preparation involves a lot of skills, and students have to learn aptitude, coding, interviews, and creating resumes. However, at present, different tools and platforms are being used by different students for different purposes, leaving

campus placement preparation unorganized and disperse on a scattered basis for students. Additionally, these tools do not render or give a realistic impression of what actually exists in campus placement drives that take place for actual recruitment by companies or organizations. Educational institutions also have a problem tracking or preparing for campus placement activities for their students. There does not exist an overall analytical pattern for campus placement preparation and readiness on a combined or integrated platform.

## LITERATURE SURVEY

The following literature survey provides an overview of the key research contributions that inform the design of AI-driven interview preparation systems. These contributions include conversational AI frameworks, multimodal feedback methods, and adaptive learning platforms.

Daryanto et al. [1] introduced Conversate, a web-based interview preparation system that uses large language models to conduct interactive mock interviews. The system emphasizes dialogic and reflective feedback, allowing learners to improve their communication skills through conversational learning. This work shows how LLM-based conversational agents can simulate realistic interview scenarios and guide users in self-reflection.

An AI-powered mock interview system published in IJNRD [2] looked at combining conversational AI with real-time speech recognition and emotion analysis. By using voice processing and emotion detection APIs, the system increases interview realism and provides detailed performance feedback. While this approach enhances user immersion, its dependence on multiple external APIs raises challenges related to scalability, cost, and long-term use.

A study published in IJIRT [3] proposed a real-time web platform designed to support interview preparation through video-based mock interviews. The platform adjusts question difficulty based on user responses and offers personalized learning pathways, verbal feedback, and motivational content. This adaptive feature boosts user engagement, though the system mainly focuses on interview practice rather than thorough skill evaluation.

Pagar, Khairnar, and Talekar [4] presented an AI-driven interview preparation framework that combines resume analysis with mock interviews. Their system uses natural language processing for resume parsing, convolutional neural networks for emotion detection, and speech recognition modules, along with integration of an applicant tracking system (ATS). This work illustrates the potential of full automation in interview preparation, while also introducing greater computational complexity due to multimodal processing.

Gomez et al. [5] carried out a qualitative study on AI-driven mock technical interviews that involved multimodal interactions, such as whiteboarding tasks and real-time feedback. The results showed significant improvements in student confidence and readiness for interviews. However, the study also pointed out limitations in conversational adaptability, stressing the need for more context-aware and flexible AI interview agents.

Existing research largely focuses on AI-driven interview preparation as a standalone activity, with limited integration of aptitude assessment, coding evaluation, resume optimization, and institutional monitoring. In contrast, the proposed Preplyte platform offers a unified placement preparation environment that combines multiple assessment modules, AI-based feedback, and institutional dashboards to better align student preparation with real campus recruitment processes.

## **Proposed System**

The proposed system is a complete Placement Preparation and Simulation Platform that combines all the key elements of placement training—aptitude, coding, interviews, resume building, and mock drives—into one easy-to-use digital environment.

It aims to help students prepare confidently for campus placements while providing educational institutions and administrators effective tools to monitor progress and performance. The system supports three main user groups:

1. Students (individual college users) can practice aptitude questions, solve coding problems, attend mock interviews, build resumes, enroll in courses, and participate in full placement drives.
2. Institutes can manage their students, organize mock drives, track performance through reports, and view rankings via leaderboards.
3. Super Admins oversee institute registrations, manage student access, and maintain overall platform analytics.

This platform offers a realistic, end-to-end placement simulation, from aptitude tests to AI-powered interviews, with detailed feedback reports, competitive leaderboards, and resumes evaluated through ATS scoring. It bridges the gap between traditional preparation methods and real-world placement processes by integrating AI, data analytics, and engaging user experiences. The system follows a three-tier architecture model, which improves organization, scalability, and performance.

### **1. Presentation Layer (Frontend)**

- This layer is responsible for all user interactions with the system. It is developed using web technologies

such as HTML, CSS, and JavaScript, along with frameworks like React or Angular.

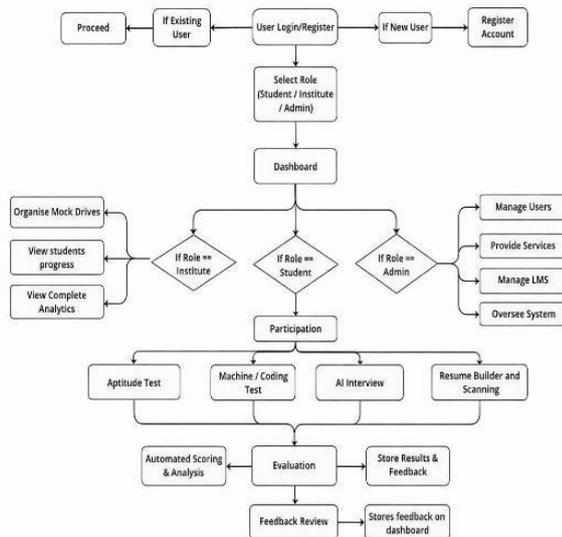
- It provides user-friendly interfaces such as dashboards, online tests, resume builders, and AI-based interview modules.
- It ensures smooth navigation and a responsive user experience for students, institutes, and administrators.

## 2. Application Layer (Backend)

- Handles core system logic, user authentication, and communication between the frontend and database.
- Developed using backend technologies such as **Node.js** or **Python frameworks (Flask/Django)**.
- Resume analysis and **ATS scoring** are implemented using **NLP techniques** with libraries such as **spaCy** or **Scikit-learn**.
- Coding assessments are managed through an **online judge mechanism** that executes code against predefined test cases.

## 3. Data Layer (Database)

- This layer stores all the data required by the system.
- It includes user profiles, question banks, test results, resumes, and performance reports.
- It is implemented using databases such as MySQL or MongoDB.
- It ensures secure, reliable, and scalable storage of information.



## Overall System Workflow

The system starts when a user accesses the platform and goes through authentication. Existing users log in with their credentials, while new users register by creating an account. After successful authentication, the user selects a role: Student, Institute, or Admin. Based on this role selection, the system redirects the user to a specific dashboard. This ensures controlled access and functionality.

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## **Student Workflow and Algorithm Integration**

Once logged in as a student, the user can access the participation module. Here, students take aptitude tests, coding tests, AI- driven mock interviews, and resume building with ATS scanning.

### **Aptitude and Coding Evaluation Algorithm**

When a student takes an aptitude or basic coding test, the system presents predefined questions pulled from the database. Each response is recorded along with the time taken. After submission, the algorithm compares the student's answers with the correct answers stored in the database. The score is calculated using the formula:

$$\text{Score} = (\text{Correct Answers} / \text{Total Questions}) \times 100.$$

Accuracy and time metrics are analyzed together to provide meaningful feedback. This algorithm ensures fair, objective, and consistent evaluation for all users.

### **Coding Test Execution Algorithm**

For advanced coding assessments, the student submits executable code through the platform. The Coding Test Execution Algorithm compiles and runs the submitted code against predefined test cases. Each test case checks for correctness, edge cases, and logic validity. Execution time, memory usage, and output accuracy are recorded. Based on the passed test cases, the system assigns a coding score and performance level, simulating real technical interview conditions.

### **AI Interview Evaluation Algorithm**

In the AI interview module, the system conducts mock interviews using an AI-driven conversational engine. Questions are generated based on the student's profile, skills, and previous performance. The algorithm evaluates responses based on content relevance, clarity, confidence, response structure, and emotional cues (if enabled). After the interview, detailed feedback is generated, highlighting communication strengths, areas for improvement, and suggestions.

### **Resume ATS Scoring Algorithm**

When the student uploads a resume, the Resume ATS Scoring Algorithm processes the document using NLP techniques. It extracts skills, education, experience, and keywords, and compares them against predefined job role templates. The resume is scored based on ATS compatibility, keyword matching, formatting, and relevance. The system then provides actionable suggestions to improve resume visibility and selection probability.

After completing these modules, all results are stored securely. Students can view consolidated performance analytics and feedback directly on their dashboard.

## **Institute Workflow**

When an institute logs in, the system provides access to analytics and management features. Institutes can organize mock drives, track student participation, monitor progress, and view complete performance analytics. The results from the evaluation algorithms help institutes assess readiness levels and identify training gaps among students.

## **Admin Workflow**

Admin users oversee the entire system. They manage users, provide services, maintain the learning management system, and ensure the system runs smoothly. Admins also monitor leaderboard integrity, platform performance, and data consistency.

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## Leaderboard and Ranking Algorithm

The Leaderboard and Ranking Algorithm processes evaluation data from aptitude tests, coding assessments, AI interviews, and resume scores. It normalizes scores and ranks students based on overall performance, consistency, and accuracy. Rankings are updated dynamically and displayed on dashboards, promoting healthy competition and motivation among users.

### Final Feedback and Analytics Loop

At the end of every assessment cycle, the system performs automated scoring and analysis. Feedback is generated and reviewed, then stored on the dashboard for future reference. This feedback loop supports continuous improvement, personalized learning, and performance tracking over time.

### Evaluation and Validation

A preliminary validation of the Preplyte platform was carried out through pilot usage with final-year students and faculty involved in placement preparation. The platform was used for aptitude practice, coding assessments, AI-driven mock interviews, and resume evaluation with ATS scoring. Feedback indicated that students found the integrated approach helpful for structured preparation, while faculty benefited from improved visibility into student progress through centralized dashboards. Although detailed quantitative analysis was not performed, the pilot usage demonstrates the practical applicability of the proposed system.

### User Feedback and Usability Insights

Feedback collected from students and faculty during pilot usage indicated that the platform was easy to use and reduced the need to switch between multiple tools for placement preparation. Students appreciated the clear structure of aptitude tests, coding practice, and interview preparation, while faculty members found the monitoring features helpful for tracking progress and identifying areas where students needed additional support. Overall, the feedback suggested that the platform improved usability and supported more effective placement training.

## IMPLEMENTATION CHALLENGES AND PRACTICAL CONSIDERATIONS

The proposed system aims to establish a strong foundation for placement preparation for both graduating and graduate students by providing a unified and structured platform that integrates aptitude practice, coding assessments, resume creation, and AI-driven mock interviews. By consolidating these resources into a single platform, institutions gain centralized access to student performance data, which helps reduce administrative effort and improves the effectiveness of training while building student confidence and preparedness. Despite these advantages, several practical challenges must be addressed. The system processes and stores highly sensitive information such as resumes, interview feedback, and performance analytics, making data privacy and security a critical concern. In addition, the fairness and accuracy of AI-driven evaluation play a vital role in maintaining student trust, as incorrect or biased feedback may negatively affect motivation and learning outcomes. To mitigate this risk, the system can incorporate Explainable AI (XAI) techniques and a human-in-the-loop mechanism, enabling transparency in scoring and allowing mentors to review or refine AI-generated feedback when necessary. To further address AI-related limitations, the platform also considers bias mitigation, secure handling of sensitive data, and adaptive learning support. Human review mechanisms help reduce the impact of biased or incorrect AI feedback, while controlled access and secure storage protect user data. In future versions, adaptive learning features can personalize assessments and feedback based on individual learning profiles, making the system more inclusive and responsive to diverse student needs. Furthermore, integrating multiple intelligent components increases system complexity in terms of design, deployment, and maintenance. From an operational standpoint, scalability and user experience also present challenges, particularly for features such as real-time speech and emotion recognition, which require reliable internet connectivity and sufficient computational resources. Dependence on third-party APIs may further increase operational costs and impact long-term reliability. Therefore, continuous optimization, regular system updates, and a strong focus on usability are essential to ensure the platform remains scalable, secure, and beneficial for all stakeholders.

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## **FUTURE SCOPE**

[1] The development of Roadmap based Skill Certification, which will provide students with step-by-step guidance through the skills necessary for certification, with a certificate issued upon completion of the course, can also be included in the future platform to provide students with clear direction on their next steps throughout their learning process. The certification can serve as a great motivator for students as they prepare for a new career and provide the student with a way to showcase their abilities on their resume, which will increase their chances of obtaining a position at a company.

[2] A possible enhancement to the future platform would be AI- assisted Placement Prediction. This will allow the platform to evaluate a student's abilities, performance and progress, and predict their potential for being ready for placement. This will give students a good idea of their current status and areas in need of improvement, as well as provide colleges and universities with an overview of current placement trends. [3] The future platform could also have additional Mentor and Company Dashboards. Mentors will have access to monitor their student's progress as well as provide tailored support. Company Dashboards will allow companies to quickly assess prospective candidates for placement. This will help to establish a stronger and more transparent connection between students, mentors and recruiters.

## **CONCLUSION**

The Placement Preparation and Simulation Platform brings together all essential components of campus placement training, including aptitude practice, coding assessments, interview preparation, resume building, and learning modules, within a single integrated system. Unlike traditional approaches that rely on multiple unconnected tools, the proposed platform offers an end-to-end placement preparation solution with real-time assessment and AI-driven feedback to support continuous improvement.

Through role-based access, students are able to practice, evaluate their performance, and improve their skills in a structured manner, while institutions can efficiently organize mock placement drives and monitor student progress through centralized analytics. The platform also enables administrators to manage system-wide operations and performance insights effectively.

By combining automation, analytics, and user engagement, the platform provides a structured and personalized preparation experience that aligns academic training with industry expectations. Overall, the proposed system demonstrates how artificial intelligence and data-driven technologies can enhance placement readiness, support institutional training efforts, and create a comprehensive ecosystem for graduate career development..

## **REFERENCES**

1. Recent research has focused on using artificial intelligence to improve interview preparation with realistic simulations and personalized feedback. Daryanto et al. (2024) introduced Conversate, a web-based system that uses large language models to conduct interactive mock interviews and provide reflective feedback. Their work emphasizes learning through conversation, helping students think about their responses and improve communication skills over time.
2. An AI-powered mock interview system published in JNRD examined how conversational AI integrates with real-time voice and emotion analysis. By using speech recognition and emotion detection APIs, the system creates realistic interview environments and delivers detailed performance feedback. While effective at improving realism, the system relies heavily on external APIs, which may impact scalability and long-term use.
3. Another study published in UIRT proposed a real-time web platform designed to assist students in interview preparation through video-based mock interviews. The platform adjusts question difficulty based on user responses and provides personalized learning plans, spoken feedback, and motivational content. This method showed better engagement and adaptability but mainly focused on interview practice rather than overall skill assessment.
4. Pagar, Khairnar, and Talekar presented an AI-driven interview preparation system that combines resume

analysis with mock interviews. Their system uses NLP techniques for resume parsing, CNN-based emotion detection, speech recognition, and applicant tracking system (ATS) integration. This work highlights the potential for complete automation in interview preparation but adds extra computational complexity.

5. Gomez et al. (2025) conducted a qualitative study on AI- driven mock technical interviews involving multimodal interactions, such as whiteboarding tasks and real-time feedback. Their findings showed clear improvements in student confidence
6. and interview readiness. However, the study also pointed out limitations in conversational flexibility, indicating a need for more adaptive and context-aware AI systems