Mitra Employability Portal: AI-Assisted Employability Training and Assessment Platform

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ABSTRACT

Getting from college into a job is more competitive than it used to be, so preparing for placements has become a real part of a student's journey. Beyond their degree subjects, students are expected to build aptitude, reasoning, communication, coding, resume-writing, interview and domain skills. The trouble is that the resources and tests for all of this sit on different platforms, which makes a step-by-step routine hard to follow. The MITRA Employability Portal is being built as one place that supports students through placement preparation. It offers videos, notes and study material, followed by topic-wise Multiple Choice Question (MCQ) tests and full assessments. The Training module covers quantitative aptitude, logical ability, verbal ability, reasoning ability, resume building, interview preparation, coding and domain-specific knowledge. The Assessment module offers both proctored and non-proctored tests. Proctored tests use camera monitoring, tab-switch detection and third-person detection; a student gets three warnings, after which the test is locked for 24 hours. Students can also upload their own question content, and the portal pulls the questions out of it so they can build a customized MCQ test. A Psychometric module adds one more way of assessing students. Administrators can manage study materials, question sets, scheduled tests, student performance and reports. Overall, the system aims to give students a structured, flexible and centralized environment for improving their placement readiness.

Keywords— Employability, Placement Preparation, Online Assessment, MCQ Test, Online Proctoring, Psychometric Assessment, Student Performance Analysis.

INTRODUCTION

Placement preparation matters a great deal in higher education, especially for students nearing graduation. When companies recruit, they usually look at several things together: aptitude, reasoning, communication, technical knowledge, coding ability, the quality of the resume and how well the candidate performs in an interview. Because of this, students cannot depend on their regular curriculum alone and need to keep preparing steadily.

A big difficulty for students is that preparation resources are spread over many platforms. Videos, notes, practice questions, mock tests, coding material and interview guidance are usually found in different places. It is therefore hard for a student to follow a proper sequence and to see how far they have actually come.

The MITRA Employability Portal is proposed to bring placement preparation and assessment into one environment. A student first completes their profile, and once it reaches 100% completion, the main MITRA modules open up.

The Training module offers learning material on quantitative aptitude, logical ability, verbal ability, reasoning ability, resume building, interview preparation, coding and domain-specific knowledge. Domain preparation can be provided for streams such as EXTC, MBA, Civil, Mechanical and CSE.

Once students have gone through the material, they can take topic-wise MCQ tests, which give them a quick way to practice and check their own understanding. The portal also has a student-generated test facility: a student

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uploads their own question content, the system processes it and pulls out the questions, and the student can then build a customized test from them.

The Assessment module supports proctored as well as non-proctored tests. Non-proctored tests suit everyday practice and evaluation, whereas proctored tests add extra monitoring for controlled examinations. In a proctored test the camera is used together with tab-switch and third-person detection. When suspicious activity is noticed, the student is warned, and after three warnings the test is locked for 24 hours.

The portal further includes a Psychometric module and performance analysis features. Administrators can handle learning resources, question sets, tests, schedules and student performance reports.

In short, MITRA is meant to be more than an online test platform. It is an integrated employability preparation system that brings together learning, practice, assessment, self-created tests, psychometric evaluation and performance monitoring.

LITERATURE REVIEW

A. Employability Skills

Earlier studies on graduate employability point out that students need a mix of technical and non-technical skills when they start work. Problem-solving, communication, teamwork, adaptability and the habit of continuous learning come up again and again in connection with employability [1], [2].

This suggests that placement preparation should not stop at aptitude or technical exams. Students need chances to build and test the different skills that recruiters look for [4].

B. Higher Education to Workplace Transition

Work on the move from higher education to employment suggests that academic knowledge by itself may not fully prepare students for what workplaces expect. Graduates have to use what they know in practical situations and show communication, problem-solving, learning and adaptability skills [3].

A structured employability platform can therefore help students get ready for the different parts of recruitment before they enter the workplace.

C. Online Assessment

Online assessment is a convenient way to evaluate students through objective tests [5]. MCQ-based assessments work especially well for aptitude, reasoning, technical knowledge and other objective areas of preparation.

The need, however, changes with the purpose of the test. A practice test usually does not need strict monitoring, while an institutional or formal assessment may need extra supervision. MITRA handles this by offering both proctored and non-proctored modes.

D. Online Proctoring

Online proctoring adds a layer of monitoring during remote examinations. Camera-based monitoring and detection of suspicious activity can help keep exam conditions under control.

The proposed MITRA system uses camera-based monitoring for proctored tests. It treats browser tab switching and the presence of a third person as suspicious events. Warnings are issued, and after three of them the test is locked for 24 hours.

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E. Personalized Test Creation

Most online learning systems come with fixed question banks and ready-made assessments. Students, though, often have their own questions from study material, past exams, classroom resources or other sources.

Letting students upload these questions and build customized tests makes practice far more flexible. MITRA does this by extracting questions from uploaded content and using them to form student-generated MCQ tests.

F. Research Gap

From the reviewed approaches, a few areas stand out where an integrated platform can add value.

- Placement resources are often spread over different platforms.
- Learning material and assessment are not always available in one structured environment.
- Students mostly rely on predefined question sets.
- Practice assessments and monitored examinations may need separate environments.
- Performance information may not be kept in one place.
- Psychometric assessment is not always linked with placement preparation.

MITRA tries to close these gaps by combining structured learning, topic-wise tests, full assessments, student-generated tests, proctored and non-proctored assessments, psychometric assessment and performance analysis in a single platform.

Problem Statement

Students preparing for placements have to build several skills and practice them regularly. Yet the learning resources, practice questions, assessments and performance information they need are usually scattered across different platforms.

Students also tend to depend on tests that are already made for them. They may have question resources of their own but no easy way to turn those questions into a structured practice test.

Institutions, too, need different kinds of assessment environments. Regular practice tests do not call for strict monitoring, but formal online examinations may need camera-based proctoring and detection of suspicious activity.

The problem this project addresses, therefore, is to develop a centralized employability platform that offers structured placement-learning resources, topic-wise and full assessments, student-generated tests from uploaded questions, proctored and non-proctored examinations, psychometric assessment, and performance monitoring for both students and administrators.

PROPOSED METHODOLOGY

The proposed MITRA system is made up of several connected modules that support student preparation as well as administrative management.

A. Student Profile Completion

A student starts by completing their profile. When the profile reaches 100% completion, the remaining MITRA modules become accessible, as illustrated in Fig. 4.

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B. Training Module

The Training module provides structured preparation material for Quantitative Aptitude, Logical Ability, Verbal Ability, Reasoning Ability, Resume Building, Interview Preparation, Coding and Domain-Specific Knowledge, with domain areas such as EXTC, MBA, Civil, Mechanical and CSE. The learning material can include videos, notes, study material and practice resources.

Fig. 1 shows the training flow. The student picks a topic, goes through the related videos, notes and study material, attempts a topic-wise MCQ test, submits it, and then looks at the result and performance analysis.

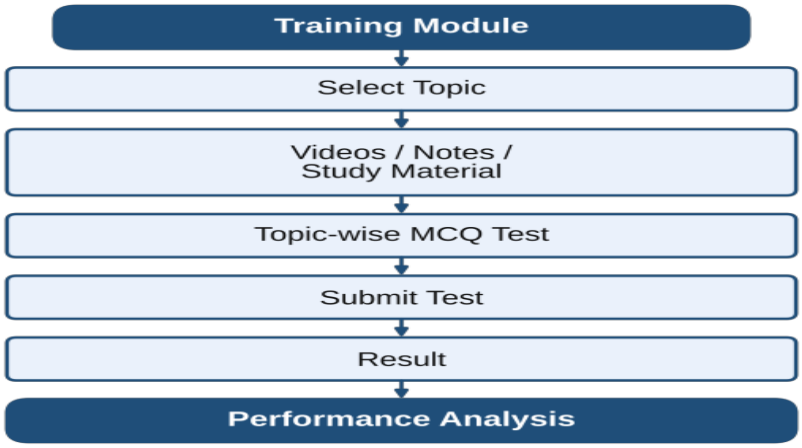


Fig. 1. Training module flow.

C. Topic-Wise MCQ Tests

After finishing the material for a topic, students can attempt a topic-wise MCQ test. These tests let students practice what they have learned, spot weak areas, check their understanding and keep track of their performance. The results can then guide what to study next.

D. Student-Generated Test

One of the main features of the system is that students can create their own practice tests. A student uploads their own question content, and the system processes it and extracts the questions it finds. The extracted questions can then be selected and used to generate a customized MCQ test, as shown in Fig. 2.

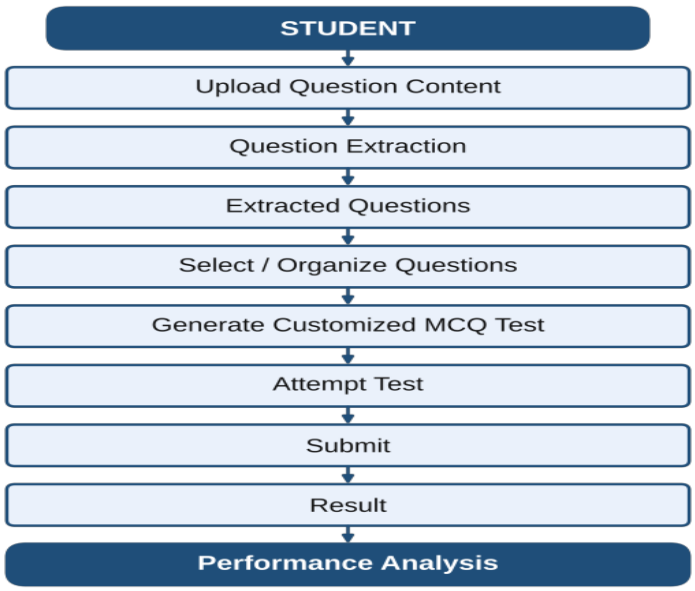


Fig. 2. Student-generated test flow.

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E. Assessment Module

1) Non-Proctored Test: Non-proctored tests are meant mainly for regular practice and evaluation. They include MCQ-based questions, a normal test environment, automatic evaluation, result generation and performance analysis. Camera monitoring is not needed for these tests.

2) Proctored Test: Proctored tests are designed for assessments that need additional monitoring. They include camera-based monitoring, browser tab-switch detection, third-person detection, a warning mechanism, a test-lock mechanism and a performance report.

F. Camera-Based Proctoring

During a proctored assessment, the system watches for two predefined kinds of suspicious activity: browser tab switching and the appearance of a third person. If nothing suspicious is detected, the test goes on as normal. If something is detected, the student receives Warning 1, Warning 2 and Warning 3 in order, after which the test is locked for 24 hours.

G. Full Assessment

Students can also take a full assessment that covers several preparation areas, such as quantitative aptitude, logical ability, verbal ability, reasoning, technical knowledge, coding-related knowledge and other chosen placement topics. Its purpose is to give an overall picture of how ready the student is for placements. Depending on its purpose, it can be run as a proctored or a non-proctored test.

H. Psychometric Module

The Psychometric module gives an additional way of evaluating students. The Training and Assessment modules mostly deal with academic and placement-related preparation, whereas the Psychometric module offers extra insight into student characteristics that matter for employability. This makes the system broader than a conventional aptitude-test platform.

I. Performance Analysis

Once students finish their tests, they can see how they performed. The system can show test scores, topic-wise performance, correct and incorrect answers, assessment results, areas that need improvement and overall progress. This analysis helps students understand where they stand in their preparation and where more practice is needed.

J. Admin Module

The administrator has central control over the system, covering study material, questions, tests and the monitoring of student performance, as summarized below.

- Study Material: add, update and manage existing resources.
- Questions: add MCQ questions, and create and update question sets.
- Tests: create tests, schedule online tests, conduct tests and manage assessment types.
- Monitoring: monitor student performance, view results, download reports and analyze progress.

The overall administrative flow, from managing content to conducting proctored or non-proctored tests and generating reports, is shown in Fig. 3.

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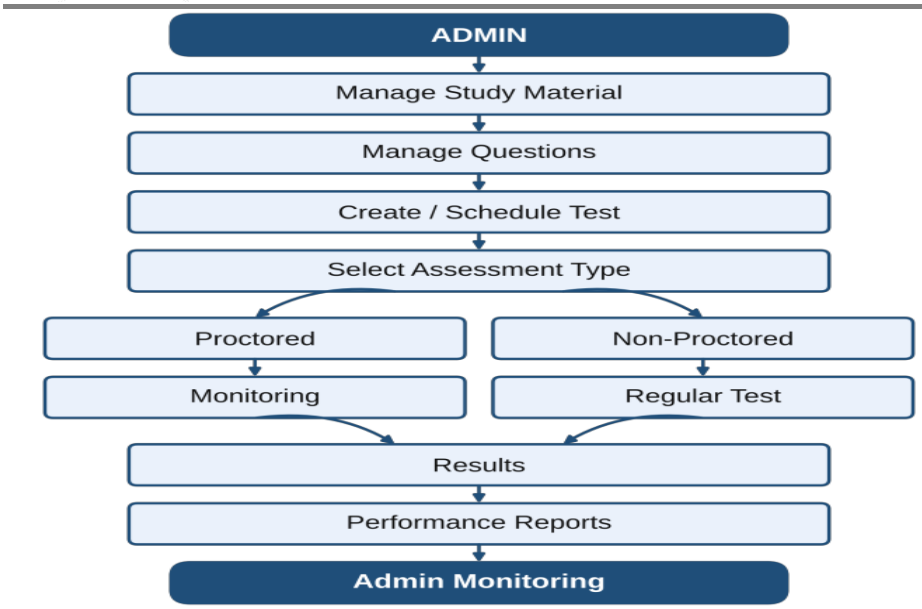


Fig. 3. Administrative workflow.

V. Complete System Flow

Fig. 4 shows the complete MITRA system flow, with the student and administrator sides together. On the student side, completing the profile opens the main modules (Training, Assessment and Psychometric), leading through topic-wise training, the student-generated test facility and the proctored and non-proctored assessment paths, and ending in the full assessment. On the administrator side, content and question management lead to scheduled, monitored or regular test conduction. Both sides then meet in a common pipeline of test results, performance analysis and reporting that serves students and administrators alike.

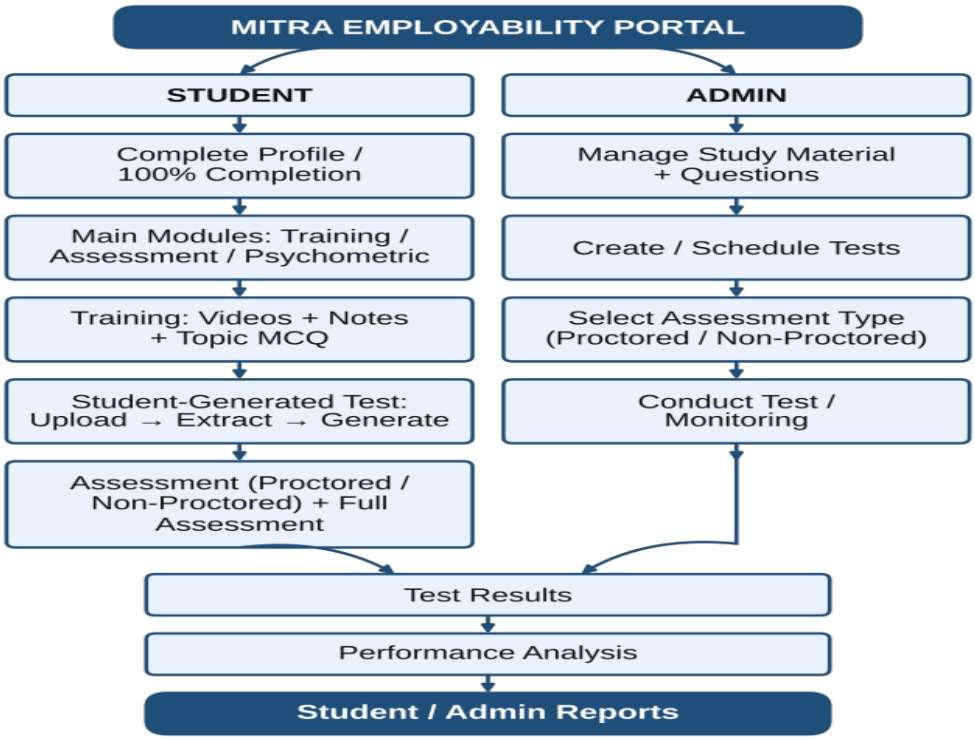


Fig. 4. Complete MITRA system flow (student and admin sides).

Vi. Expected Contribution

The proposed MITRA Employability Portal is expected to contribute in the following ways.

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1) Centralized Placement Preparation

The system gathers different placement-preparation resources on one platform.

2) Structured Learning and Assessment

Students can study a topic and then attempt a related MCQ test, which creates a clear learn-then-evaluate process.

3) Student-Generated Tests

Students can upload their own question content and generate customized practice tests, giving them more control over their preparation.

4) Flexible Assessment

Having both proctored and non-proctored tests lets the platform meet different assessment needs.

5) Secure Online Assessment

Proctored assessment offers camera-based monitoring and detection of suspicious activity through tab-switch and third-person detection.

6) Performance Monitoring

Students can track their own results, while administrators can follow overall student performance and generate reports.

7) Psychometric Evaluation

The Psychometric module adds another dimension to employability assessment.

Future Evaluation

The MITRA portal is still under development, so its effectiveness can only be evaluated after implementation. Possible evaluation parameters include the following.

Student satisfaction, system usability, question extraction accuracy, success rate of customized test generation, student performance improvement, test completion rate, proctoring detection performance, number of false warnings, system response time and administrative efficiency.

Actual numerical results should be added only after the completed system has been tested.

CONCLUSION

The MITRA Employability Portal is proposed as a centralized platform for structured placement preparation and student assessment. It brings learning resources, topic-wise MCQ tests, full assessments, psychometric evaluation, student-generated tests and performance analysis together in a single platform.

A key feature is that students can upload their own question content, from which the system extracts questions and generates customized MCQ-based practice tests.

The Assessment module supports non-proctored tests for regular practice and proctored tests with camera-based supervision, tab-switch detection and third-person detection. A three-warning mechanism is proposed, after which the test is locked for 24 hours.

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Administrators can manage study material, questions, tests, schedules, student performance and reports. Taken together, these features aim to build a structured and flexible environment that supports students throughout their placement preparation journey.

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