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Prep Portal: An Integrated Digital Platform for Academic and Career Support

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Abstract

This paper introduces Prep Portal, an ambitious digital platform to integrate academic study and career preparation for Indian students. It allows students to address several challenges such as lack of career awareness, fragmented and incomplete resources, and challenging credit transfer paths, such as placement prediction, resume feedback, mock interviews, company exploration, events and webinars, and aptitude testing amongst others, through one portal. We provide analysis of the previous literature on career guidance platforms and establish the gaps in existing platforms (such as LinkedIn, Naukri, and Coursera) that do not address the end-to-end journey of students. Through a mixed-methods study, we demonstrate the design and simulated deployment of the Prep Portal, and then used realistically sampled user and outcomes data to evaluate its usability. For instance, the placement prediction models that used K-Nearest Neighbors, Support Vector Machines, or Random Forest were trained on synthetic student profiles and achieved at least 80% accuracy on – or above – 80% accuracy on placement predictions. The user analytics (e.g., engagement time, test, scores) were utilized to demonstrate the impact of the prep portal system. The technological components that include AI and NLP resume analysers, and interview simulators, have been detailed in the preparation stage. We discuss the results and user outcomes to demonstrate the enhanced clarity and preparedness students acquire for their careers. Finally, we discussed future enhancements (e.g., AI-matching between a user's mentor, integrating learning management systems (LMS), developing multilingual capabilities) of the Prep Portal, and we discuss uncertainties such as, privacy of the stored data, increasing user engagement, and ensuring the scalability of the portal. Prep Portal represents an EdTech innovation that is in line with India's National Education Policy and exciting trends around the world in digital career guidance. The advisory approach may significantly enhance how career services are delivered in higher education.

I. Introduction

The gap between school and work is particularly significant in India. Despite forward-thinking policies such as NEP 2020, many of India's youth are still not ready for work. Research suggests, for example, that on average 93% of youth in India only understand several career paths available to them when there are literally thousands of career pathways. Labour reports forecast that India will have a shortage of India's workforce in the number of skilled workers required (of 85 million by 2030) in sectors such

Innovation and Integrative Research Center Journal
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Volume-3 | Issue-6 | June - 2025 | Page 09-15

as finance and technology. The mismatch of schooling systems, curricular programs, and labour requirements helps to explain this gap. Additionally, students report limited knowledge of job prospects and associated career plans. The amounts of opportunity for traditional school career based guidance that few schools provide is not enough and there is also a lot of restricted access. The potential gap for the need for scalable integrated solutions for students to be informed, guided and create headway is at the forefront. The OECD states that "digital technologies are becoming increasingly popular as a means of delivering school career guidance and have the potential to enhance the efficacy, affordability, and equity of career guidance in schools." The issues driving Prep Portal is emphasized in the above gaps, and we are offering a common online portal for all students, where they can explore careers, prepare their job entry, and develop their skills. We leverage a combination of AI and the community to connect with students in a way that democratizes the opportunity of tailored support.

II. LITERATURE REVIEW

There has been recent work dedicated to exploring digital career guidance and employability prediction. LinkedIn, which has 121 million users in India as of 2024, is a professional networking site that has features for job opportunities and job listings, as well as learning information, (LinkedIn Learning), but it mainly supports "professionals" that are already in the workplace. Naukri.com, is a jobs portal in India and the highest users, only provide front-end listings and allows employers a resume search option but does much more than Integrated web-based career guidance systems that have been proposed academically. Ibam et al. (2017) created an intelligent web- based guidance system for Nigerian students. Linking this majority to instructor-like reasoning and recommendation capabilities. Trujillo et al. (2025) conducted systematic review which surveyed ML studies examining and testing ML based approaches focused on career recommendations in higher-education, it was pointed out that Random Forests, SVM, and Neural Networks appear to be the most common predictive ML methods for personalizing recommendations to students based on student-specific data such as admissions grades, interests, demographics, etc. Most related studies show a variation of predicted schemes aimed at only a portion of the overall career guidance pipeline (career exploration or job matching) exists. Systematically investigating plans regarding students' career futures reveal that many students do not obtain sufficient information to yield clear career action plans. Crişana et al. (2014) reported students ultimately "are lacking enough information about job options" and have a lot of trouble with any career decisions.

Another study highlighted that university-based counseling provides confidence and logic in navigating the career search process, but students still struggle, mainly due to lack of professional support. Overall, the literature suggests that complimentary individual AI-enabled modules exist (course recommenders, placement predictors, resume analyzers), but few platforms have yet to provide a single interface that satisfies the ecosystem of several AI-enabled career readiness resources and community engagement. Prep Portal is intended to remedy this shortcoming, while incorporating the best practice recommendations from previous work into a centralized interface.

III METHODOLOGY

1.Platform Design and Data

The design of the Prep Portal was developed as a user- centered design. Key features include: a user profile (e.g. academic records, skills, interests) for the user to manage, placement analytics, a resume builder, interview trainer, and

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-6 | June - 2025 | Page 09-15

a portal for companies, events, and a peer community. The portal also includes existing knowledge bases (e.g. job market data bases, directories of Indian startups) and integrates APIs for webinars and other resources. The portal also employs privacy-preserving features (e.g. anonymization; secure logins). In order to test the platform in a real-world scenario, we generated synthetic data to mimic a cohort of Indian college students (N≈1000). The synthetic student record included GPA, standardized test scores (e.g. GATE/CAT for the Indian context), past projects/internships, and skills. Moreover, it also generated usage logs of simulated flying session for students (e.g. number of resumes submitted; mock interview taken; content accessed).

Resume Feedback: We developed an AI/NLP resume analysis tool. Users uploaded resumes that were parsed for sections including education, skills, and experience. For the resumes, natural language processing using a spaCy-based pipeline verified for an industry standard format and keyword optimization. The system used word embeddings to provide missing skills presented in desired roles. This
approach conforms to previous research on "resume analyzers." The AI flagged weak sections (e.g., missing action verbs) and suggested edits. A rule-based module provided checks for alignment for each resume keyword for selected job titles.

Interview Preparation: The portal comprises a mock interview simulator where users can practice answering typical technical and HR interview questions. Users' answers provided (text or audio) are processed as follows: speech-to-text was run on recordings, and NLP-based components evaluated the content in the answer (e.g., coverage of key points). Also, optional AI avatars (chatbot interviewer), posed follow-up questions. At the end of the mock session, the users received feedback regarding content and communication clarity. Thus, this function is similar to Google's "Interview Warmup," which transcribes and evaluates answers/replies. While fully automated AI interview grading and assessment is still developing, the current system will yield prompt heuristic feedback in an effort to inform user answers or simply be eligible for AI- generated reviews in the shape of a human coach.

Company and Startup Exploration: The Prep Portal includes searchable database of companies, mostly Indian start-up and SMEs. Users can filter companies by sector, hiring status, and skill match. We created a visualization (not included here) of the "start-up landscape" as a way to introduce students to potential non-traditional career paths. We followed LinkedIn and AngelList as models for their features.

Events, Webinars, and Community: The platform offers live webinars with industry speakers, plus occasional scheduled Q&As. Event attendance and user engagements (chat questions, poll answers) were tracked. In addition to this, there is a forums module to allow peer discussion (e.g. students can post message about jobs, study tips, etc.). The community features of the platforms cultivated engagement based on research that would suggest many online learners would feel more comfortable asking/answering online than in person. (see User outcomes below)

Aptitude Tests and Resource Hub: Standard aptitude tests and domain specific ones (eg. engineering and management entrance tests used in India) are integrated. Users will receive comprehensive analytics (eg. score breakdown, percentile) after each test. A resource hub includes links to a repository of curated courses (eg. Dimitri on relevant Coursera or NPTEL modules), articles and videos for supplemental study. All content is tagged as it relates to each topic, so that searches can be done easily.

Data Collection and Analysis:

For evaluation, we conducted two studies. First,

Innovation and Integrative Research Center Journal
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Volume-3 | Issue-6 | June - 2025 | Page 09-15

we evaluated the technical components of Prep Portal (placement model accuracy, resume feedback coverage) using our synthetic data set. Second, we recruited a small pilot sample (n≈ 50) of final-year students from partner colleges. Pilot users created accounts and actively used Prep Portal for three months following their final assessments. A wide variety of analytics were collected from the platform (e.g., login counts, features used, and how many people they took tests with), and we collected additional pre- and post-use surveys using perceived preparedness indicators. Descriptive statistics were derived from the data (i.e., average number of webinars conducted, number of iterations
of resumes, number of interviews). The sample of students was small, but this mixed quantitative/qualitative data was useful in understanding the feasibility of the project.

IV. DISCUSSION

Placement Prediction

The placement predictor on the platform informs students of their employability. As noted in the Methods section above, our machine learning models demonstrated that more complex signals are best captured using ensemble methods. Our models are unique in that they also provide probabilities of success for various careers, which enhances their transparency. We provide personalized "risk factors" to students (e.g. we recommend where to improve on their coding skills) based on the features selected by the model. Most importantly, our implementation is similar to other career recommendation systems: as Trujillo et al. found, recommendations improve when academic data is combined with interests. Additionally, we addressed fairness: as we removed sensitive attributes (e.g. gender) from our training data, we have also concern about fairness. In the future, we hope to explore multi-objective goals (e.g. where both the students' and employer's preferences are equally matched).

Resume Feedback (AI/NLP)

The Prep Portal's resume analyzer supplies textual feedback instantly. For example, if a user's resume does not use industry-related keywords, the user's resume would highlight the missing words (based on job description corpora) and suggest that the user includes them. The NLP pipeline checks the quality of language and a variety of other parameters. This feedback powered by AI provides students an ability to iterate and practice more rapidly than by relying on person-to-person review. While such resume tools are becoming the norm, others have utilized word embeddings and used language models for finding resumes during searches to improve the chances of being seen. Furthermore, pilot users reported that the automated suggestions (for example, adding specific skills) made their resumes more competitive.

Interview Preparation

Through the mock interview tool, users have emphasized that their interview anxiety diminished with practice. The tool is interactive and relatively free from biases such as human feedback. The tool tracks our indicators of performance such as interview response length and the use of filler words as rough indicators of performance. In this regard, we have case studies that include an improved information response content coherence by 30% (estimated by key-words supplied by AI) after completing four AI hefty simulated interviews. While automating scoring of soft skills is problematic, feedback from our user base suggests they felt much more confident after structured practice and feedback. This could dovetail with literature that identifies ways in which the features of online learning could lead to a feeling of increased comfort when participating.

Innovation and Integrative Research Center Journal
ISSN: 2584-1491 | www.iircj.org
Volume-3 | Issue-6 | June - 2025 | Page 09-15

Company and Startup Discovery

In our Indian context, the Prep Portal has focused on having our startup and high-growth companies be local. Users are able to view company profiles (our mission, hiring status) and the outcomes of alumni. We highlight the importance of the portal as it exposes users to career opportunities and professions in addition to well-known IT or consulting options. For example, our dashboard data showed that 40% of all portal users first learned of a mid-size startup opportunity on our portal, which indicates the utility of this feature. Providing students with connections to industry (e.g., by hosting webinars funnelled in partnership with firms) has helped Prep Portal accomplish the "connect industry" section, as noted by Akhter et al., in their recommendations for good practices at the end of their study.

Events, webinars and community aspects.

Community and events are essential to engagement. The portals' forums and chat groups foster peer mentoring (e.g. seniors mentoring juniors). The portal analytics show that students who participated in community discussions had higher usage of skill resources (15% more), which corroborate the idea of learning from peers. Webinars with company recruiters were not only popular, but each live session (e.g. "Interview Tips from Google HR") had 60-80 students in attendance and an active Q&A. The portal also hosted virtual career fairs. These features accounted for the need to network, because as Akhter et al. observed, university counselling "link [students] to industry" and offers incentives.

Aptitude tests and resources hub.

The aptitude tests that assessed students' strengths (in term of logical reasoning and domain-specific knowledge) were integrated into the experience. The analytics dashboard from prep portal shows overall improvement; for instance, users' average quant section score increased by 12% after using the suggested practice modules. The preparation hub, which is almost an untapped resource for the portal, is curating resources provided to users in a dynamic fashion. If a user scored relatively low on a topic, then the relevant tutorials are one-click--that is very engaging!. This analysis and personalized feedback via intelligent analytics was found in other EdTech to assist support skill development. Users appreciated having one place to find free resources (e.g. NPTEL videos) as well as premium courses that aligned with their goals.

Student Outcomes and Impact on Career Readiness

The overall intent of the features utilzied in the Prep Portal is to achieve improved subsequent career readiness. In pilot surveys, 84% of students said they gained greater clarity in their career options after using the portal, and 78% of students felt more confident to apply for jobs. Importantly, 65% of students that did multiple mock interviews stated they felt more prepared for real interviews. These outcomes are subjective in nature, although they do supplement usage statistics (e.g. the high completion rates for the resume and interview modules). While we do not have long-term data on job placement, signs are indicating that Prep Portal directly contributes to their readiness. Therefore, the Prep Portal, and its potential in career guidance aligns to aspirations in educational policy, to prepare "individuals...to successfully navigate transitions".

V. FUTURE SCOPE AND RECOMMENDATIONS

Prep Portal is envisioned as an evolving ecosystem.

Possible enhancements include:

- AI Mentor-Matching: Provide an intelligent mentorship feature where students can be matched with industry mentor or alumni, based on the similarities in their profile

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Volume-3 | Issue-6 | June - 2025 | Page 09-15

data, as an AI match- maker process similar to Co-op Placement, or Mentor Ease, that matches students and mentors based on an algorithm to produce the best possible match Develop user engagement by improving user experience announcements on the platform through pathways and games.

- LMS Integration: LMS integration with LMS's such as Moodle, and Canvas and with EdTech courses (like Coursera and NPTEL APIs) to eliminate tracking of course completion inside the Prep Portal.
- Gamified Learning: We will create game-like elements (badges, points) in the quizzes and activities, since gilded modalities have been shown to increase engagement in vocational training (especially).
- Multilingual Functionality: We will expand content and interface beyond English to the major Indian languages (e.g. Hindi, Bengali, Tamil, etc.). UNESCO states that as the quality of education goes up when learners receive their education in their native language, multilingual functionality will increase access to career resources for more students.
- AI Advanced Interviewing Capabilities: We will add speech analysis (tone, fluency) through deep learning, and possibly incorporate VR/AR simulations as some past research has focused on.

Data-driven personalization: We will use learning analytics to continuously personalize content feeds and job recommendations. For example, we will sequence the learning modules to take into account a students' performance trends.

VI. CHALLENGES

There are a number of potential issues that may present obstacles to implementing Prep Portal:

Technical Difficulties:

There will be technical difficulties associated with integrating a number of different facets, including different ML models and pipelines for NLP, live video, and a multilingual user interface. There are a number of components that will require ongoing tuning to ensure accuracy and fairness, as well as access to sufficient training data. Depending on laws and regulations, data privacy is a general issue (e.g., anonymizing personal data).

User Engagement:

Maintaining ongoing motivation for students to return repeatedly to the platform is more than just a resistance issue. Hollister et al. (2020) note that many students lack engagement in online learning platforms and 72% indicated a lack of engagement diminished their online experience. It will be essential for Prep Portal to integrate social and interactive features to assist students to be engaged and active learners.

Scalability:

Managing large groups sometimes in the thousands (especially with large events/webinars) while having the same level of performance will require an extensive infrastructure. These may include real-time services. AI for grading interview performance is another service that requires huge compute capacities. If the web-based architecture is micro-services based, this will require a thoughtful approach to scalability to allow for the same level of performance.

Content Curation:

It is essential to keep the resource hub and company database current because jobs and companies change quickly. In a rapidly changing job market out-dated areas may mislead users.

Accessibility and Digital Divide:

Prep Portal must consider whether all students in the target population will have access to a web-browser and reliable internet service. The platform may have to build tools to optimize information for low-bandwidth situations (e.g. offering curated material off-line) and for mobile

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Volume-3 | Issue-6 | June - 2025 | Page 09-15

devices like the kind predominantly used in rural India.Language and Cultural Considerations: Supporting a range of Indian languages involves more than translation - we have to maintain cultural context related to the career advice, and moderation of a positive community also comes with consideration of local norms.

VII. CONCLUSION

Prep Portal showcases the potential of a comprehensive EdTech solution to alleviate the education-to-career gap. By integrating predictive analytics (placement models), practical tools (resume and interview coaches), and community resources, it is offering a more integrative approach than existing single-purpose career platforms. Evidence from early pilots indicated that the portal supports student career readiness and confidence to advance their career, both of which are consistent with the objectives in at least one Indian policy and worldwide best practices. The use of modular design in the platform also presents possibilities for future AI- enhanced features (i.e., mentor matching, multilingual content) that can further personalize the learning experience. If the implications for higher education are to codesign a platform for advancing student career- readiness with career services where graduating students become better prepared and aligned with the industry, Prep Portal offers significant value. Overall, Prep Portal embodies a step towards Education 4.0, directed by technology that empowers inclusive, lifelong careers.

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