Parichay: Maharaja Surajmal Institute Journal of Applied Research

Gradeaid – A: Comprehensive Student Prediction Model for Final-Year BCA Students

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ABSTRACT

The increasing demand for personalized academic and career guidance for students necessitates innovative solutions that leverage technology to address individual needs. Final-year BCA students often face challenges in evaluating their academic performance, determining employability readiness, and choosing appropriate career paths, such as higher education or job placements. Traditional systems lack the ability to provide real-time, data-driven insights tailored to individual student profiles.

This paper presents a web-based application that addresses these gaps by integrating predictive analytics and personalized recommendations. The system predictsacademic performance using historical data, assesses placement readiness by evaluating key skills, andprovides actionable career recommendations. By utilizing advanced machine learning algorithms and offering a user-friendly, accessible interface, this application aims to empower students and educators with timely, accurate insights, helping students make informed decisions and improving overall academic and professional outcomes.

Keywords: Academic Performance Prediction, Career Guidance, Placement Readiness Assessment, Higher Education Recommendations, Machine Learning in Education, Personalized Academic Analytics

1. INTRODUCTION

In today's rapidly evolving academic and professional landscape, students, especially those in their final year of undergraduate programs, face the significant challenge of making informed decisions about their future. These decisions often revolve around crucial aspects such as academic performance, employability skills, and career direction. However, the traditional academic systems primarily focus on delivering course content without providing students with sufficient personalized, data-driven insights to assess their readiness for placements or further studies.

As BCA students approach the end of their undergraduate journey, they need to evaluate their academic performance, analyze their strengths andweaknesses, and receive guidance on the next steps in their career. Given the competitive nature of both the job market and higher education, making these decisions based on subjective opinions or generic advice can lead to missed opportunities and suboptimal outcomes. To address this issue, there is an urgent need for a platform that combines data-driven predictions with personalized career recommendations.

Moreover, many existing platforms focus solely on either academic performance tracking or career guidance rather than integrating both elements, along with predictive analytics, employability assessment, and career recommendations in a unified solution. Henceforth, there is a great need of developing a web application that resolves all the problems faced bystudents and efficiently utilizes their limited time and decisions.

In this paper, we are proposing a web application, "GradeAid" built to resolve all the snags faced by final year students of BCA. In section 2 and 3, objectives andusers of the application are stated. Sections 4 and 5 give an overview of the drawbacks of the existing system and benefits of the proposed system, respectively. Various tools and technologies used to develop the current system are given in section 6. Section 7 deals with the project insights and section 8 discusses the conclusion and future scope of the proposed system.

2. OBJECTIVE

The primary objective of GradeAid is to leverage technology and data analytics to enhance the academic journey and career development of final-year BCA students. The platform is designed to address key challenges students face during their transition from education to professional life, ensuring they are well- equipped to make informed decisions about their academic performance and career paths. Below are the key objectives:

Academic Performance Prediction Placement Readiness Evaluation Personalized Career Recommendations Real-Time Insights and Reporting

Data-Driven Decision Making

Secure and Scalable Web-Based Platform User-Friendly Interface and Accessibility Enhanced Career Path Clarity

3. USERS

GradeAid is designed to serve a wide range of users, each benefiting from its data-driven features. The primary users are final-year BCA students who use the platform to track their

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academic performance, assess employability skills, and receive personalized career recommendations. Educators and academic advisors leverage GradeAid to monitor student progress and provide targeted guidance. Career counsellors use it to offer personalized career advice, while placement officers assess students' readiness for job placements. Institutional administrators benefit from aggregated data to inform curriculum decisions, while parents and guardians can stay informed about their child's academic and career development. Collectively, these users work together within GradeAid to foster student success through informed decision-making and personalized support.

4. DRAWBACKS

There are numerous impediments with the existingapplications. Several hitches with the extant state of thesystem are as follows:

→ There is no single application in which all the identified problems are solved.
→ Lack of Predictive Analytics forAcademic Outcomes
→ Generic Career Guidance andPlacement Support
→ Static and Delayed Feedback
→ Lack of Tailored Solutions for Final-Year Students
→ Clunky User Interface and PoorAccessibility
→ Fragmented Data and Lack ofIntegration
→ Inability to Scale with Growing StudentData
→ All the above-mentioned complications stipulate a need to develop a web application that overcomes all the shortcomings of the prevailing system.

5. BENEFITS

The proposed system will include all the characteristics to rectify the hindrances faced by BCA Final year students in the current scenario. The various advantages of the currently proposed systems are stated as follows

→ Personalized Academic and CareerGuidance
→ Predictive Analytics for AcademicPerformance
→ Skill Development and EmployabilityAssessment
→ Real-Time Insights and Feedback
→ Holistic Development of Students
→ Improved Placement Readiness
→ Empowerment for Educators andCareer Counselors
→ Time and Cost Efficiency

6. TECHNOLOGIES USED

Frontend Technology for GradeAid

The frontend of GradeAid is designed to deliver a simple, intuitive, and responsive user experience. Key components of the frontend technology include:

→ HTML (HyperText Markup Language)
→ CSS (Cascading Style Sheets)
→ JavaScript
→ Bootstrap

Backend Technology for GradeAid

The backend of GradeAid is designed to handle the logic, data processing, and interaction with the machine learning model efficiently. It ensures smooth communication between the frontend interface and thecore functionalities. The technologies used in the backend include:

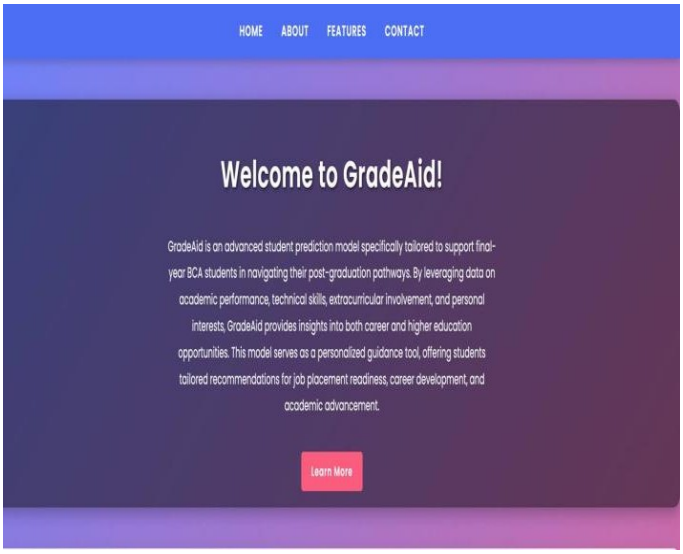
→ Python
→ Flask Framework
→ Machine Learning Model
→ SQLite Database

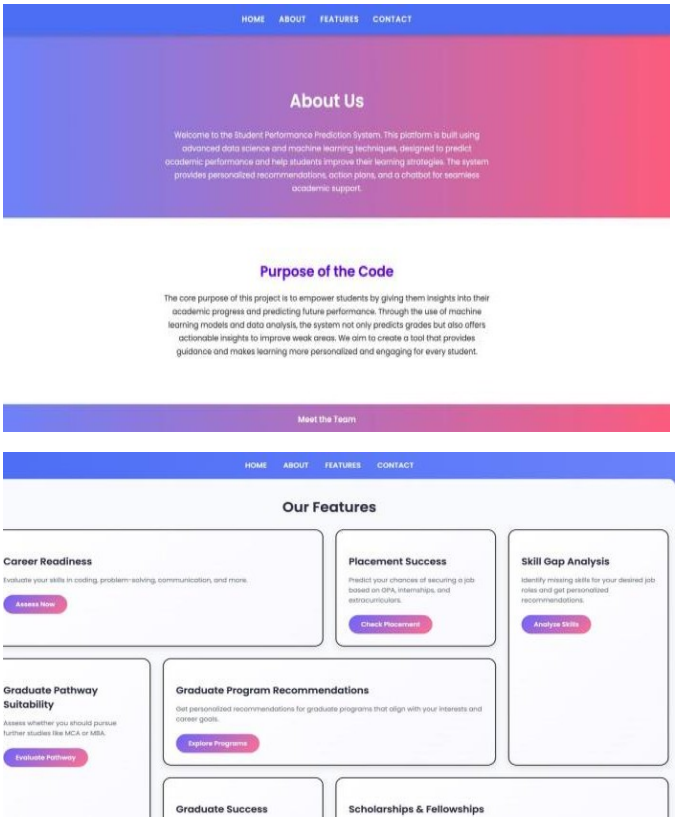
7. PROJECT INSIGHT

GradeAid is an intelligent student prediction model web application tailored specifically for final-year BCA students, aimed at addressing the critical decisions they face regarding career and higher education options. This project integrates machine learning techniques to analyze various attributes, including academic performance (GPA), internships, project work, and skill levels (both technical and soft skills). Based on this data, GradeAid provides personalized recommendations for career paths, such as job placement or pursuing advanced degrees like MCA or MBA.

The system is designed to guide students by offering actionable insights into their preparedness for the job market or higher education, thus empowering them to make informed decisions about their future.

GradeAid not only predicts outcomes but also identifiesareas for improvement, such as enhancing coding skills or undertaking additional internships, ensuring holistic development for the students. The model's design and implementation focus on accuracy, scalability, and ease of use, making it a valuable tool for academic advisors and placement officers in addition to students.





8. FUTURE SCOPE

As technology and educational needs evolve, the future of GradeAid holds great potential for further development and enhancement. Some possible future enhancements and areas of growth include:

- → Integration with Other EducationalPlatforms
- → Incorporating Artificial Intelligence (AI)for Enhanced Personalization
- → Mobile App Development
- → Collaboration with Employers and Educational Institutions
- → Integration of Soft Skills Training andCertifications
- → Integration with Alumni Networks

9. CONCLUSION

In this paper, we have identified several challenges faced by final-year BCA students in terms of academic performance, career decision-making, and employability. We have also examined the limitations of existing systems that fail to comprehensively address these issues. The authors of this paper propose a solution in the form of the GradeAid web application, which aims to rectify these shortcomings by providing predictive analytics for academic performance, personalized career guidance, employability skill assessments, and real-time feedback. GradeAid effectively bridges the gap between education and career, ensuring that students are better prepared for their future academic or professional endeavors.

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