

INTELLIGENT EVALUATION AND PERSONALIZED ACADEMIC SUPPORT

Ms. Indumathi S

Department of Computer Science and Engineering
Vivekanandha College of College of Engineering for Women
Women Namakkal, India

Ms. Dharsheni A

Department of Computer Science and Engineering
Vivekanandha College of Engineering for Women
Namakkal, India

Ms. Dharshini M

Department of Computer Science and Engineering
Vivekanandha College of Engineering for Women
Namakkal, India

Ms. Manju B

Department of Computer Science and Engineering
Vivekanandha Engineering for Namakkal, India

Abstract: The present study introduces web-based guidelines that use organized pre-analysis assessments to improve academic results. The portal allows users to register and take part in various kinds of evaluations, such as psychometric assessments, practical coding assignments in Java, Python, and C, and theoretical multiple-choice questions (MCQs). The platform carefully logs and examines student performance changes over a specific period, improving and enhancing the educational materials required to improve academic achievement. The platform optimizes students' learning experiences using machine learning algorithms to find developments in student data, forecast academic success, and offer personalized help.

Keywords: Web-based learning, AI-driven academic support, Machine Learning.

I. INTRODUCTION

Today's educational environment presents many problems for students that could drastically impact their academic achievement. To ensure successful learning, innovative approaches are required due to the growing complexity of educational materials and the expanding needs of learners. Based on each student's unique learning needs, teachers have to provide them with specific recommendations and assistance. A creative platform that uses pre-analysis competence screenings to evaluate students' academic potential was developed in answer to this consumption. This platform revolutionizes the conventional assessment process and makes technology-enabled tailored education possible by combining theoretical exams, functional coding workouts, and psychometric evaluations. Before starting a course, students' fundamental understanding is assessed using the pre-analysis ability assessments. These tests identify gaps in knowledge and serve as a starting point for personalized lesson programs. To evaluate students' comprehension of fundamental ideas and theories and provide a strong foundation in the topic, theoretical tests are essential.

Practical experience is delivered by hands-on coding exercises, which analyze coding abilities by applying real-world issues and projects. The creation of individualized learning programs that cater to the particular requirements of each student is made possible by the insights that psychologists offer into cognitive capacities, learning styles, and psychological characteristics. A crucial element is ongoing feedback, which helps students see their areas of strength and outcomes, supports a growth mental state, and supports their continued growth. A vital component is ongoing feedback, assisting students to see their areas of strength and progress, promoting a growth outlook, and supporting their continued growth. The platform uses cutting-edge machine learning algorithms to evaluate performance data and offer personalized suggestions, ensuring every student receives a unique education. Students are engaged and active learning is encouraged by the engaging and easy-to-use layout. Teachers gain from comprehensive reports that offer actionable insights for focussed guidance, as well as automated grading that preserves time and minimizes mistakes made by people. Through technology-enabled personalized learning, the platform's scalability and potential for integration with other educational materials provide a complete and logical learning ecosystem, ultimately altering education to enhance academic outcomes globally.

II. RELATED WORKS

With the development of multiple platforms and tools targeted at improving student learning through adaptive technologies, detailed evaluations, and the addition of machine learning algorithms, educational technology has seen significant developments. This section examines several crucial topics, stressing the advantages and drawbacks of each. This involves assessment tools, machine learning in education, adaptive learning platforms, and psychological examinations.

The way that educational content is delivered is being completely altered by adaptive learning platforms, which offer specific learning experiences that satisfy the needs of individual students. These platforms use data-driven algorithms to continuously improve the content based on student achievement, ensuring that every learner receives only the most relevant and useful material. Khan Academy is a well-known educational platform that offers free online courses, lessons, and practice exercises. By reviewing student performance on quizzes and exercises, Khan Academy identifies areas where learners struggle and provides directed practice and feedback to address those gaps, which improves learning outcomes and enhances student engagement.

Another well-known website for offering online degrees, fields, and courses from notable colleges and institutions around the world is Coursera. By customizing the course material for each student, Coursera's adaptive learning system permits individuals to progress at their own speed. The tool keeps track of student performance and adjusts quizzes and assignments to be as taxing as the learner can handle. Students will be sure to stay participated and learn the information you to this customized approach.

DreamBox Learning is designed exclusively for K-8 young people, DreamBox Learning is an adaptive educational platform. With a primary focus on teaching mathematics, it uses real-time data to tailor each student's learning experience. The adaptive engine of DreamBox repeatedly reviews student performance and modifies the learning route as applicable. The application helps students get an advanced understanding of math concepts with its scaffolding and immediate feedback.

For evaluating students' knowledge, skills, and skills, evaluation resources are essential. These instructional materials give trainers crucial details about how well the pupils they teach behave and point out areas in which they may do better. Among the most widely used tools for evaluation is codesignal, This renowned site assesses programming skills. It provides an assortment of technical tests and programming assignments that assess a candidate's aptitude for coding, problem-solving, and algorithmic thinking. Employers, coding boot camps, and educational institutions utilize CodeSignal's tests to determine students and those seeking employment technical competence. However, CodeSignal lacks integrated psychometric assessments that evaluate critical thinking and personal improvement, instead emphasizing technical competence.

Another renowned resource for technical interviews and coding exams is Hacker Rank. For both professionals and students in refining their coding skills, it offers a range of coding challenges, contests, and mock interviews. Employers and educational institutions utilize Hacker Rank's assessment tool to gauge their skills in technology. Hacker Rank like Code Signal eliminates psychometric tests measuring personality and mental abilities.

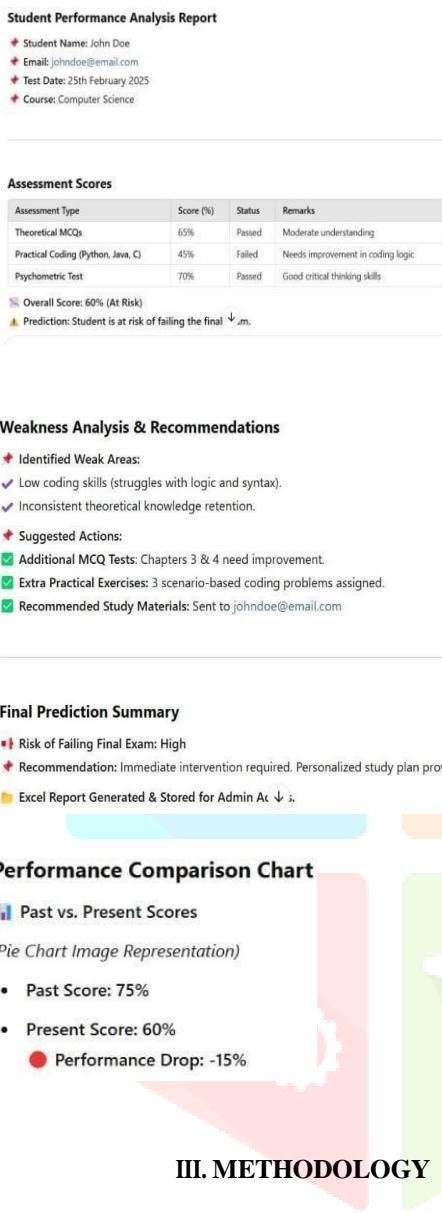
Edmentum offers a set of assessment tools intended to gauge pupil achievement and give instructors useful information. Formative, summative, and benchmark assessments covering a broad range of subjects and grade levels are included in the platform. The data-driven outcomes of Edmentum's examinations, which are in line with academic norms, assist instructors in personalizing their lessons to fit the demands of their students. Edmentum does not incorporate psychometric evaluations but does offer thorough academic assessments.

In order to evaluate growth in pupils and guide instructional decisions, assessment tools are crucial. However, many assessment methods' ability to offer an exhaustive overview of student performance is impeded by the lack of integrated psychometric evaluations. Understanding all kinds of student skills alongside offering support needs psychometric tests assessing critical thinking, creativity, and personal transformation.

Here are now greater chances to enhance methods of instruction and learning thanks to the use of machine learning (ML) in the learning environment. Big amounts of data may be analyzed by ML algorithms to find developments evaluate student performance, and offer specific suggestions. Some of the remarkable uses of machine learning in educational settings are Knewton is a modern adaptive learning platform that analyzes student data and provides customized learning experiences using machine learning algorithms.

The technology used by Knewton constantly evaluates student performance and modifies the subject matter to meet each student's unique needs. Knewton assists students in achieving improved learning outcomes by pointing out knowledge gaps and offering focused practice. Real-time adaptations and individualized feedback are made possible by the platform's usage of machine learning, which improves the way students learn overall.

SAMPLE OUTPUT IMAGES



III. METHODOLOGY

The platform's creation and execution entail an array of crucial elements intended to ensure an exhaustive and successful approach to boosting academic performance through structured pre-analysis evaluations. User registration, assessment design, collection and preprocessing, predictive modeling, creation of custom assistance tools, performance evaluation and assessment, system deployment and upkeep, and additional tasks have been included within these processes.

Module 1: Registration of Users

A key initial phase in ensuring that students may safely access the platform so they can take part in the tests is the user registration procedure. Several components have been included in the registration process.

Module 2: Account Creation

Students make use of a username, password, and unique email address for determining accounts. This first step is essential to establishing a safe and personalized user profile.

Module 3: Profile Completion

Students are requested to fill out their profile by entering further details including their learning objectives, academic interests, and grade level. The online tool uses that information to better personalize tests and educational resources for every particular learner.

Module 4: Practical Coding Tests

To check students' coding skills, scenario-based coding questions are produced using rigorous test cases in Python, Java, and C. These practical tests push students to show off their problem-solving skills and apply their programming knowledge to actual situations. Specific test cases have been included alongside every coding question to determine the precision as well as efficiency of the students' solutions.

Module 5: Psychometric Tests

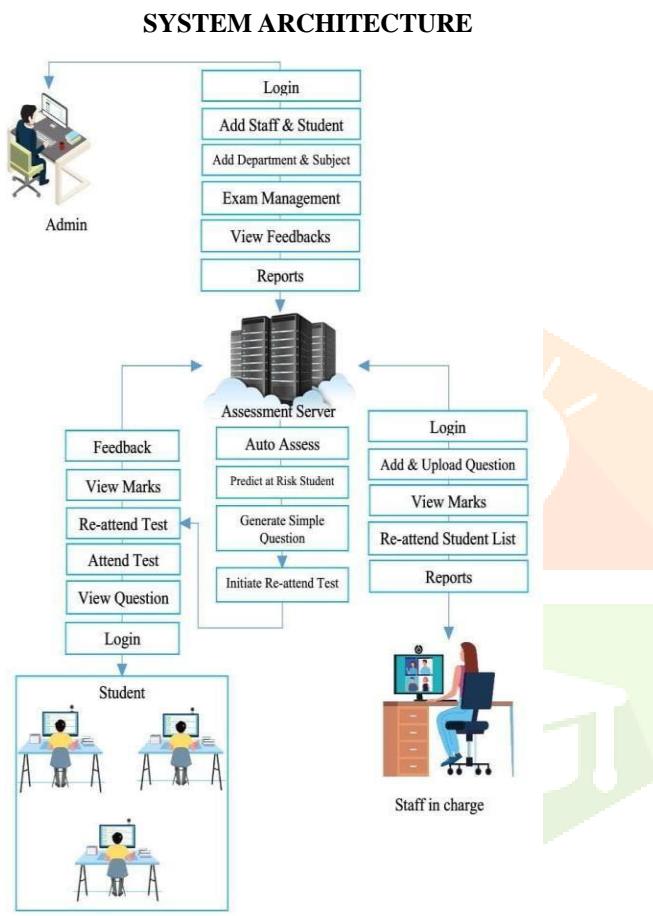
These assessments serve to assess students' critical thinking, creativity, and personal development while providing a window into their personality and cognitive characteristics. Tasks that evaluate emotional intelligence, spatial awareness, and logical thinking may be included as psychometric assessments. These assessments provide an extensive understanding of pupils' areas of growth potential.

CONCLUSION

There's an excellent likelihood that the platform will enhance learning results. Instructors can provide focused interventions that cater to the particular requirements of each student by providing personalized assistance based on accurate data and predictive modeling. This approach encourages a love of learning and personal growth as well as improving the level of education.

The promise of machine learning in education should be examined more thoroughly in future experiments, research additionally ought to enhance prediction models along with identifying other variables affecting how well students do. Taking everything thought about, the platform analyzed in this study is a significant advancement in the field of educational technology.

The platform offers an informative and individualized learning experience by blending machine learning algorithms with theoretical tests, practical applications coding responsibilities, and psychometric evaluations. The method being suggested guarantees that the platform is reliable, safe, and useful in evaluating and upgrading student performance. Such cutting-edge platforms will be significant in deciding the pattern of education going along with supporting students in developing their true academic potential.



We have created an advanced evaluation and tailored academic support system that is genuinely groundbreaking, and designed to enhance the effectiveness and efficiency of the academic assessment process. By integrating machine learning algorithms, automated grading, predictive analytics, and adaptive learning, we provide students with a personalized learning experience. The illustration presented outlines the structure and functionality of the system, highlighting its critical components: Administrator, Assessment Server, Responsible Staff, and Students.

Each of these roles plays a vital part in ensuring the seamless operation of the system, encompassing academic management, the provision of intelligent assessments, and the delivery of support tailored to student requirements. The admin oversees the whole evaluation process, taking care of user management, scheduling exams, and keeping track of feedback. The Assessment Server is the core of the system, automating the assessments, predicting which students might need extra help, generating new questions, and even managing retake tests.

The Staff in Charge, typically teachers, takes care of the test content, evaluates how students are performing and assists with any re-assessment needs. Meanwhile, students log in to take tests, check their scores, retake tests if needed, and provide feedback that helps enhance their learning experience.

The entire workflow kicks off with the admin registering students and staff, assigning subjects, and setting up exam schedules. Then, teachers create and upload their test questions. When students log in, they take their tests, which the Assessment Server grades automatically.

The findings aid in recognizing students who might be at risk, thereby allowing for the application of tailored educational interventions. These students are afforded the chance to retake evaluations to enhance their performance, while teachers can review reports to modify their support approaches as needed. This system presents numerous benefits, including improved user and examination management for administrators, automated grading and analytical insights for teachers, and personalized learning opportunities for students.

We are looking forward to the exciting opportunities that lie ahead. Imagine personalized learning experiences powered by artificial intelligence, chatbot assistance for complex academic questions, smooth integration with Learning Management Systems, and engaging gamification strategies that keep students actively involved.

With the addition of AI-driven assessments and predictive analytics, we're set to change the educational environment. Our goal is to guarantee that every student gets the personalized support they need while enabling educators to make knowledgeable, data-driven choices. The Assessment Server is a key part of this vision, delivering personalized learning personalized to each student's unique needs.

The system blends various AI and machine learning techniques to constantly enhance the evaluation process. The implementation of automated grading systems alleviates the burden on educators while guaranteeing that evaluations are conducted in an equitable and impartial manner.

Artificial intelligence algorithms analyze student performance data and identify patterns in learning behaviors, enabling the system to recommend the most appropriate educational resources. The predictive analytics component examines historical student performance and assesses their engagement levels to identify individuals who may be facing challenges and require additional support. Personalized learning is at the core of this system, personalizing assessments to help each student focus on their weak spots.

Also, it promotes self-learning by encouraging students to think about their results, learn from any mistakes, and retake assessments as many times as they need to until they truly understand the material. Plus, having feedback mechanisms in place gives us insight into how engaged students are and identifies areas where they might be facing challenges, teachers can take this feedback to fine-tune their teaching approaches and tweak the difficulty of their assessments. Our Assessment Server makes adaptive testing possible, meaning the system changes the difficulty of questions based on how students are responding, which makes learning way more effective.

Plus, the addition of chatbots boosts student support they offer instant help with academics, answer questions, and guide students through their assessments. Educators possess the capability to observe student performance in real-time, allowing for prompt interventions when required. The integration of interactive components, including rewards, leaderboards, and achievements, significantly enhances student motivation and engagement. These components transform evaluations from mere grading instruments into dynamic educational experiences.

The system provides educational institutions with increased flexibility to tailor it to their unique academic requirements. Through the utilization of cloud-based integration, organizations can successfully deploy the system across multiple departments and campuses, thereby improving the assessment process with meaningful insights obtained from data. Additionally, it is equipped with robust security measures, including encrypted databases and multi-factor authentication, which safeguard student information from unauthorized access and ensure the protection of their privacy.

As educational institutions increasingly seek to implement innovative academic support systems, ongoing advancements in artificial intelligence and data analytics are anticipated to enhance the efficacy of these tools, thereby rendering them more accessible and better equipped to address diverse learning requirements.

The integration of blockchain technology to protect academic records and maintain their integrity has the potential to greatly revolutionize the assurance of transparency and reliability in certifications and assessments. Furthermore, the sophisticated evaluation and personalized academic support system surpasses the function of a simple assessment tool. It establishes a comprehensive framework dedicated to ongoing enhancement and adaptive learning, prioritizing students in their educational experiences.

This methodology signifies a notable transformation in the evaluation of academic advancement, utilizing technology to link assessments with individualized learning opportunities. By accepting these smart systems, education becomes more personalized, allowing students to get the support they need at their own pace. The future of learning lies in integrating these systems, making education more effective, comprehensive, and innovative for students around the world.

REFERENCES

- [1] S. Selvarajah and T. H. Sihombing. "Design and Development of an Online Assessment System for Computer Science Education."
- [2] H. Sun, J. Gu, and Z. Ma. "An Online Assessment System with Personalized Learning for K-12 Education."
- [3] R. A. Rizvi and S. H. Shah. "Development of an Online Assessment System for Programming Courses."
- [4] S. M. Gandomani, E. L. Low, and N. Salim. "Design and Implementation of an Online Assessment System for Higher Education Institutions."
- [5] S. Thota, C. Gupta, and R. Sahay. "A Web-Based Intelligent Assessment System for Computer Science Education."
- [6] F. L. Sánchez-Rada, J. Martínez-Mirón, and M. A. Sicilia. "Development of an Online Assessment System for E-Learning Environments."
- [7] A. B. El Khamlichi Drissi, M. O. H. Bellafkhi, and M. Ouhbi. "Design and Implementation of a Web-Based Online Assessment System."

- [8] S. P. Gajarla and S. K. Gudavalli. "An Online Assessment System for Educational Institutions."
- [9] K. Yoon, S. C. Yoon, and C. Lee. "Development and Evaluation of an Online Assessment System for STEM Education."
- [10] M. Mohammadi and A. Abidin. "A Web-Based Automated Assessment System for Programming Courses."
- [11] McLaren, B.M., Adams, D.M., Mayer, R.E., & Forlizzi, J. (2017). A Computer-Based Game that Promotes Mathematics Learning More Than a Conventional Approach. International Journal of Game-Based Learning.

