AI Curriculum Planner

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Project Description

• AI Curriculum Planner

Within the realm of education, the traditional education systems often rely on set curriculums, leaving students navigating a confusing and static academic pathway. These methods don't consider the personal lifestyles and needs of today's students. This is where our AI Curriculum Planner comes into play. Using advanced AI, our system offers real-time course adjustments that are specifically tailored to students who are caught in complicated or unique situations. Regardless of whether you're a working student, an athlete looking to balance sports and academics, or someone who just wants to work independently, our tool is designed to help make your journey less of a hassle. This system doesn't stop at individual planning either, it also encourages people to work together and enable group collaboration, streamlining and making group projects go much smoother than ever before. Teachers and parents can also take advantage of this by accessing detailed student data to make sure their performance is up to pace with their peers, this opens new opportunities to not only help guide students who are in need, but also allows teachers, parents, and students to all connect with one another. Overall, the AI Curriculum Planner's purpose is to make the journey easier for students by allowing them to simplify, personalize, and enhance their academic planning, ensuring that they get the best learning experience possible in an environment that can be stressful at times.

• High Level Non-Technical Description

Our AI Curriculum Planner database system will act as a central repository of curriculum plans, learning modules, and assessment results along with real-time feedback. It will utilize AI

algorithms to check and search through data to identify trends that will benefit students in finding their educational requirements all the while suggesting curriculum changes accordingly. And to make things easier for students, we have a feature where students shall be able to input their academic organization and it will provide them with previous helpful comments from students who have attended said school in the past, this can be filtered to make it easier for students to find useful tips on their academic journey. We'll also have a feature where the AI will automatically suggest changes in curriculum based on individual student's progress, preferences, and availability, that way, students won't have to stress sifting through an abundance of classes to find the ones they need to graduate, students shall be able to modify these suggestions to fit with their respective schedules. There will be other features such as real-time feedback, integration with global trends, and holistic data views. Real-time feedback allows students to have access to the most up-to-date information on their classes as fast as possible, while the integration of global trends and holistic data views will allow the AI to adjust and swap courses based on educational trends such as demographic, performance, and feedback data.

- # Use Cases

Use Case: Working Students

Actors: Working Student (Sarah)

Sarah is a university student who is juggling between her part-time job and her university courses, she faces challenges in managing her schedule. And using the AI Curriculum Planner, she's able to input her working hours and academic preferences and the system recognizes her limited availability. Doing so, the AI delicately selects courses that fit within her schedule and range of preferences. Additionally, the real-time feedback feature provides Sarah with insights from other students who are also working and going to school at the same time, offering tips to Sarah on how to balance work and studies effectively.

Use Case: Students Who Don't Want to Rely on Counselors

Actors: Independent Student (John)

John is a student who relies on himself most of the time, and on the rare occasions that he has visited academic advisors or counselors, he always left each session unsatisfied. When John stumbled upon the AI Curriculum Planner, he was automatically drawn to it, as it removed the need for him to meet with counselors in person and take matters into his own hands related to his academic courses. Upon analyzing John's past performances and goals, the AI generates a list of recommended courses and resources for John to utilize. The system also tells John what prerequisites or corequisites he might need to take certain courses, ensuring that John stays fully informed and can independently make academic decisions without having to ever worry about meeting counselors or advisors again.

Use Case: Students Balancing Athletic and Academic Pursuits

Actors: Student Athlete (James)

John is a prominent member of his college basketball team. As an athlete, his schedules are filled with rigorous training sessions, team meetings, and travels for matches. His commitment to the team is unwavering, but he is just as equally determined to excel academically, finding that balance, however, has been challenging for John. Upon registering with the AI Curriculum Planner, the system prompts him to input his training schedules, match days, and potential out-of-town tournaments. Using this data, the planner provides James with a fully tailored and personalized course schedule. It prioritizes courses that have flexible timings, attendance options, and professors known for their understanding of student-athlete schedules.

Use Case: Parent-Teacher Performance Review

Actors: Teachers (Ms. Durham), Students (Alex), and Parents

Ms. Durham, a high school teacher, schedules a performance review meeting with the parents of Alex, one of her students. Before the meeting takes place, she utilizes the AI Curriculum Planner to pull up Alex's performance metrics, feedback, and course progression. On the other hand, Alex also adds his own feedback and reflections on his performance, areas that he feels good about, and areas that he feels are still lacking and need improving. During the meeting, his parents have access to this data, which leads to more productive conversations on Alex's academic development, strengths, weaknesses, and future goals in the course.

Use Case: Group Presentation Preparation

Actors: Students (Anna, Ben, Carlos), Teachers (Professor Kent), Media Lab Technician (Ms. Anders)

Professor Kent's class requires a collaborative presentation where students must come together and form a team to produce multimedia-rich reports. Anna, Ben, and Carlos form a team to explore a certain topic. Their goal is to integrate textual analysis, historical context, and multimedia elements like videos and audio clips into their presentation. Using the AI Curriculum Planner, the team lists their tasks and gets to work. Carlos finds that he needs to use the university's media lab for editing, using the Planner's system, he is able to book specific hours with Ms. Anders, the media lab technician, and she receives a notification about the booking. After the three put together their findings, they then submit a draft via the Planner. Professor Kent reviews it and provides them with feedback directly on the platform, highlighting areas needed for improvement. With the teamwork enabled by the AI Curriculum Planner, the three students were able to combine their efforts to deliver a compelling presentation that earns them high marks from Professor Kent, showcasing the capabilities of the AI Curriculum Planner in streamlining collaboration and resource management for a more straightforward academic task.

Potential Benefits for Existing Software/Products

- Canvas Learning Management System (LMS)

Why: Canvas is one of the more popular Learning Management System used by educational institutions worldwide to manage online courses, facilitate communications between teachers and students, and to distribute assignments along with grades. By integrating with the AI Curriculum Planner, Canvas can enhance its already existing management system even further. For example, Canvas could proactively suggest classes to students based on their academic history, personal schedules and preferences, allowing students to have a much more personalized and intuitive time when it comes to the enrollment process. Not only that, but with the real-time feedback feature, the AI Curriculum Planner can offer students insights and advice from peers that will help them in finding courses and even professors who match their preferences in the learning environment. This wouldn't only benefit students, but educators can also use this AI system to modify or suggest changes in the course content based on the trends that are identified by the AI, ensuring that the curriculum stays up-to-date and relevant to allow for a more engaging and enriching learning experience.

- iLearn

Why: iLearn is an e-learning platform also used by various institutions to offer online courses and modules. Its main features include course creation, distribution, communication tools, and assessment capabilities. There are significant advantages iLearn can gain from integrating the AI Curriculum Planner such as the ability for students to personalize their courses based on their past performance, work commitments, and extracurricular activities, the AI system can suggest the best classes to take each semester, allowing students to effectively handle the workload and achieve their desired results. Real-time feedback will let students on iLearn to receive instant

reviews and insights from their peers who've taken the same classes in the past to let them know what to expect, this, in turn, will help students when it's time to consider which courses to enroll in next. The AI Curriculum Planner will also be keeping up with global trends to potentially introduce new courses, what this means is that the AI system will adapt to global educational shifts, for example, if there's a global emphasis on specific topics, institutions using iLearn will have the opportunity to introduce these courses to their academic plans. With these features in mind, regardless of whether you're an educator or student, the ability to have these personalized features will enhance the already existing system to cater to a much wider audience to ensure that anyone, regardless of their challenges, can find an academic pathway that suits them. Integrating the AI Curriculum Planner will move iLearn beyond a platform that just hosts courses, to a dynamic learning environment that is tailored to individual needs and is always evolving based on real-world trends and feedback.

- # Functional Database Requirements

1. User:

1.1. A user shall create only one account.

1.2. A user shall log into the system from multiple devices.

1.3. A user shall have the ability to reset their password.

1.4. A user shall view feedback and recommendations provided by other users.

1.5. A user shall be able to link their academic organization to the system.

1.6. A user shall save courses of interest.

1.7. A user shall access the system's resources like articles and tutorials.

1.8. A user shall deactivate their account.

1.9. A user shall manage privacy settings, deciding what information to display.

2. Student:

2.1. A student shall input their academic and work schedules.

2.2. A student shall receive course recommendations based on their schedules.

2.3. A student shall modify AI-generated curriculum suggestions.

2.4. A student shall provide real-time feedback for courses they've taken.

2.5. A student shall view performance metrics and course progression.

2.6. A student shall join group tasks or presentations initiated by other students.

2.7. A student shall view their academic history.

2.8. A student shall add personal milestones to track their academic journey.

2.9. A student shall receive alerts on upcoming deadlines or submissions.

3. Course:

3.1. A course shall have prerequisites that must be met before enrollment.

3.2. A course shall integrate real-time feedback from students.

3.3. A course shall be updated or replaced based on collective student feedback.

3.4. A course shall show its relevance to current global educational trends.

3.5. Each course shall display its duration, credits, and syllabus.

3.6. A course shall highlight professors or educators associated with it.

3.7. Courses shall be categorized by department or field of study.

4. Educator:

4.1. Educators shall receive updates on changes in the curriculum.

4.2. Educators shall initiate courses and define prerequisites.

4.3. Educators shall view collective feedback from students for courses they teach.

4.4. Educators shall set meeting hours for individual student consultations.

4.5. Educators shall upload course materials like reading lists or lecture slides.

4.6. Educators shall initiate group projects or assignments within their courses.

5. AI Algorithm:

5.1. The AI shall analyze student input for work and academic schedules.

5.2. The AI shall consider past performance metrics when recommending courses.

5.3. The AI shall provide curriculum adjustments based on student progress.

5.4. The AI shall detect and incorporate global educational trends.

5.5. The AI shall use student feedback to assess course quality.

6. Feedback System:

6.1. Feedback shall be linked to a specific course or module.

6.2. Feedback shall have a timestamp to indicate when it was given.

6.3. Feedback shall be anonymous unless the student chooses to reveal their identity.

6.4. Feedback with a significant negative trend shall flag the course for review.

6.5. Feedback shall be upvoted or downvoted by other students for relevance.

7. Global Trend Integration:

7.1. The system shall have a feature to detect emerging educational trends.

7.2. Trends shall be ranked based on popularity and relevance.

7.3. Courses related to top trends shall be highlighted for students.

7.4. The system shall provide articles or resources on top global trends.

8. Group Task and Presentation:

8.1. A group task shall have a defined list of student participants.

8.2. Students shall share resources and communicate within the group task environment.

8.3. Group tasks shall have a submission deadline.

8.4. Group tasks shall allow file uploads for presentations or reports.

9. Lab Booking:

9.1. Students shall be able to book specific lab hours.

9.2. Lab technicians shall receive notifications about bookings.

9.3. The system shall show available slots for lab bookings.

9.4. Lab equipment or software needed shall be specified during booking.

10. Curriculum:

10.1. The curriculum shall dynamically adapt to individual student needs.

10.2. The curriculum shall reflect current global educational trends.

10.3. The curriculum shall incorporate real-time feedback for improvement.

10.4. Curriculum pathways shall display potential career outcomes.

11. Performance Review:

11.1. Educators shall initiate performance reviews for students.

11.2. Reviews shall integrate student performance metrics, feedback, and course progression.

11.3. Parents shall access these reviews for a holistic understanding of their child's progress.

11.4. Students shall be able to respond or add reflections to their reviews.

12. Notifications:

12.1. Users shall receive notifications about course updates.

12.2. Users shall get alerts about upcoming tasks or deadlines.

12.3. Educators shall receive notifications about feedback trends on their courses.

12.4. Students shall get notifications about changes in course schedules or timings.

13. Administration:

13.1. Administrators shall add or remove courses.

13.2. Administrators shall monitor system usage metrics.

13.3. Administrators shall manage user permissions.

13.4. Administrators shall address flagged content or feedback in the system.

14. Community:

14.1. Users shall create discussion threads related to courses.

14.2. Users shall join academic clubs or societies through the system.

14.3. Users shall upvote valuable discussions or comments.

14.4. Administrators shall moderate or manage community content.

15. External Resources:

15.1. The system shall integrate external educational tools or platforms.

15.2. Students shall access external resources through the platform.

15.3. Educators shall recommend external resources or reading materials.

15.4. The system shall track resource usage to assess their value.

- # Non-functional Database Requirements

1. Performance:

1.1 The database system shall support concurrent transactions.

1.2 Response times for common queries shall not exceed 2 seconds.

1.3 The system shall handle up to 10,000 users simultaneously without any noticeable lag.

1.4 Indexing shall be applied to frequently searched columns to improve search performance.

2. Storage:

2.1 The database system shall assign 10 MB of memory per table.

2.2 The database system shall support persistent storage.

2.3 Data redundancy shall be minimized to conserve storage space.

2.4 The database system shall support storage partitioning for better data management.

3. Security:

3.1 Only encrypted passwords shall be supported by the database system.

3.2 All the values inserted into the database shall be consistent with the attribute's datatype and domain.

3.3 The database shall be automatically backed up every day at 11:59 pm.

3.4 Role-based access control shall be enforced, ensuring that users only have access to data relevant to their roles.

3.5 All database transactions shall be logged for audit purposes.

3.6 The database system shall have protection against SQL injection attacks.

4. Scalability:

4.1 The database shall support scaling out to handle increased load by distributing data across multiple servers.

4.2 The system shall add additional hardware resources without downtime.

5. Reliability:

5.1 The database system shall have a 99.9% uptime, excluding scheduled maintenance.

5.2 Any failed transaction shall be rolled back to maintain database consistency.

5.3 The system shall have failover capabilities in case the primary server goes down.

6. Usability:

6.1 The database system's interfaces shall be user-friendly and intuitive for end-users and administrators.

6.2 Errors, warnings, and notifications shall be meaningful and help the user understand the issue and its potential solution.

7. Integration:

7.1 The database shall support APIs or connectors for integration with other systems like Learning Management Systems, Financial Systems, etc.

7.2 It shall support file formats like JSON and XML for seamless integration.

8. Maintainability:

8.1 The database system shall support online upgrades without affecting the availability.

8.2 Regular health checks and optimizations, like defragmentation of storage, shall be feasible without system interruption.

9. Compliance:

9.1 The database system shall comply with regulations like GDPR or FERPA regarding student data.

9.2 Regular audits shall be conducted to ensure compliance is maintained.

10. Environmental:

10.1 The database system shall operate effectively under different environmental conditions where the servers are located.

10.2 The system shall optimize energy consumption to reduce its environmental impact.

11. Legal:

11.1 The database system shall adhere to all applicable local, state, federeal, and international laws and regulations.

11.2 The system shall facilitate compliance reporting and documentation as required by law.

12. Content:

12.1 The database system shall support multilingual content to cater to a diverse user base.

12.2 The content displayed shall be accurate, up-to-date, and free of errors.

13. Compatibility:

13.1 The database system shall be compatible with various operating systems including Windows, Linux, and MacOS.

13.2 The system shall be compatible with different database management systems to ensure smooth integration.

14. Organizational:

14.1 The database system shall align with the organization's existing workflows and processes.

14.2 The system shall be adaptable to changes in organizational structure and policies