

Youth Development: Personalized Learning Assistant

Lewisville Community Alliance



Tackling Diverse Learning Challenges in Youth Development



Diverse Learning Needs

Students have varied interests and learning challenges, making it hard to deliver a one-size-fits-all curriculum.



Time Intensive Planning

Developing individualized learning plans is labour-intensive for educators.



Engagement Gap

Low engagement with standardized materials that fail to capture students' unique interests



Goal: To create an **AI-powered solution** that generates customized learning plans, lesson content, and activity suggestions tailored to each student's profile, interests, and progress.

AI-Powered Personalized Learning Plans



Vision: The Youth Development team can scale and improve the quality of after-school programs by using **Generative AI** to create **personalized learning plans** for each student.

Key Features



Personalization



Automation



Feedback Loop



Scalability

Expected Impact

Enhanced
Engagement

Improved Learning
Outcomes

Efficiency Gains

How the AI Solution Works:

Workflow Overview

Input: Student Profile Fetching

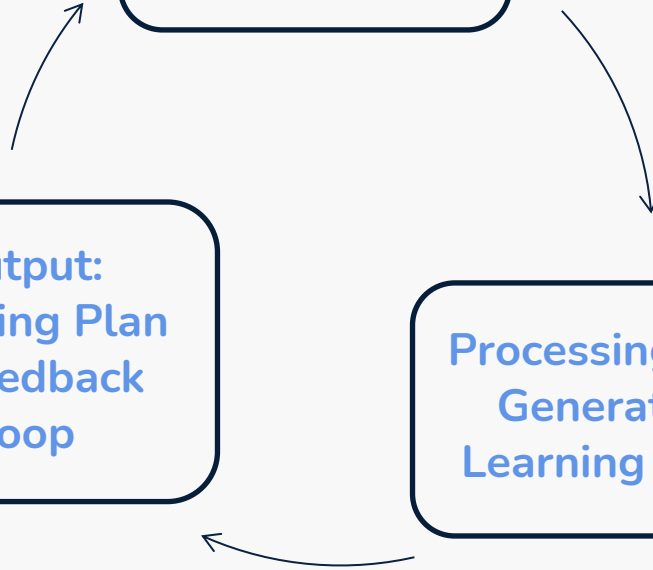
The system fetches student data (name, age, grade, interests, challenges) from a **Google Sheets** document.

Output: Learning Plan & Feedback Loop

The system presents the learning plan, which can be modified based on feedback. Users can continuously refine the plan for better personalization.

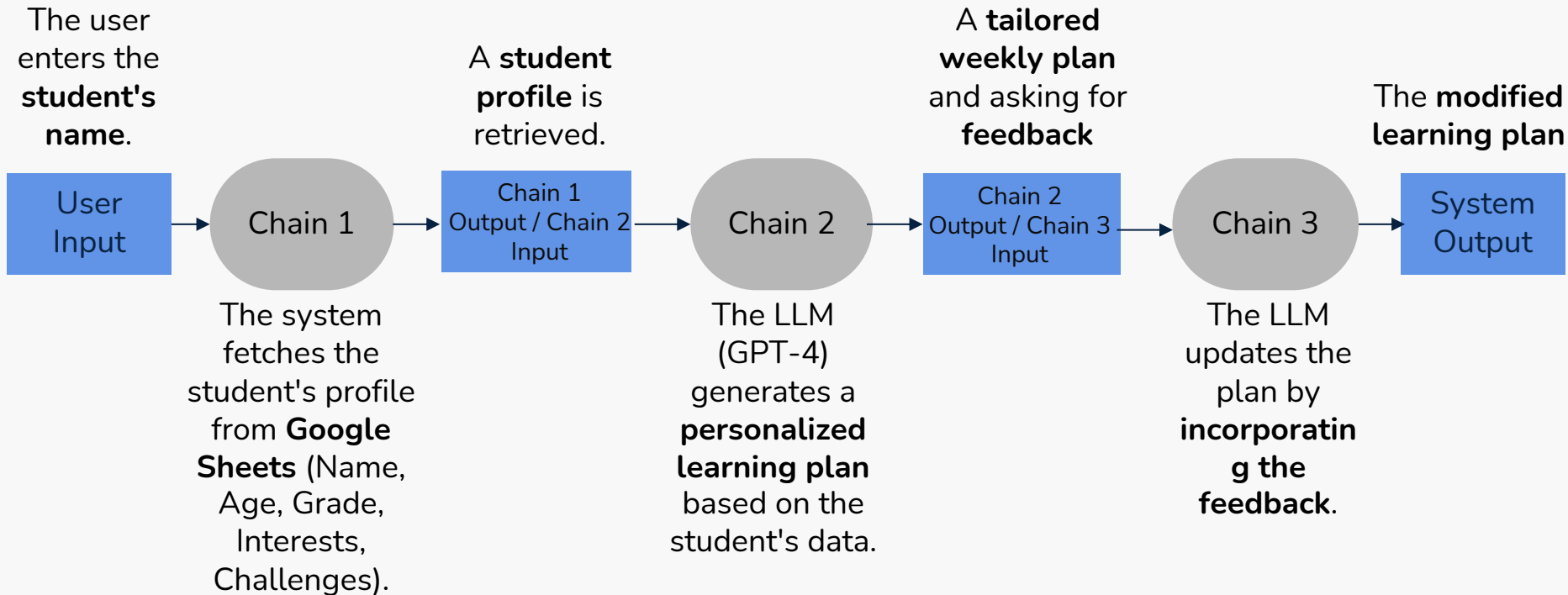
Processing: AI-Generated Learning Plan

The system uses **Generative AI (GPT-4)** to create a customized weekly learning plan that includes topics, activities, assignments, and recommended resources.



System Functionality:

Data Input, Processing, and Output



Prototype Demonstration: Generating a Learning Plan

```
... Welcome to the Learning Plan Generator!

Student profile found: {'Name': 'Alice', 'Age': 10, 'Grade': '5th', 'Interests': 'Math, Art', 'Challenges': 'Struggles with fractions'}

Generating learning plan...

Learning Plan for Alice:

**Weekly Learning Plan for Alice**

**Monday:**

_Time slot:_ 10am - 11:30am (Math)
*_Topic:_ Introduction to fractions
*_Activity:_ Simple fraction worksheets (Equivalent fractions, Comparing fractions, Simplifying fractions)
*_Resource:_ Introduction to Fractions (Math is Fun website) & 'Fraction Action' book by Loreen Leedy

_Time slot:_ 1pm - 2:30pm (Art)
*_Topic:_ Basic sketching
*_Activity:_ Sketch an image from a picture book
*_Resource:_ 'You Can Draw in 30 Days' book by Mark Kistler.

**Tuesday:**

_Time slot:_ 10am - 11:30am (Math)
...

Remember Alice, practice makes perfect; keep practicing all the concepts in Math and Art, and don't hesitate to ask for help when needed. En...
```

Name	Age	Grade	Interests	Challenges
0 Alice	10	5th	Math, Art	Struggles with fractions
1 Bob	12	7th	Science, Robotics	Needs better time management
2 Charlie	9	4th	Reading, Music	Shy during group activities
3 Diana	11	6th	History, Sports	Difficulty focusing on tasks
4 Ethan	13	8th	Programming, Chess	Overwhelmed with complex topics
5 Fiona	8	3rd	Painting, Storytelling	Struggles with reading comprehension
6 George	10	5th	Science, Astronomy	Lacks interest in classroom activities
7 Hannah	14	9th	Creative Writing, Dance	Difficulty organizing ideas
8 Isaac	7	2nd	Nature, Animals	Needs help with basic math skills
9 Jenny	12	7th	Coding, Video Games	Struggles with group collaboration

... Welcome to the Learning Plan Generator!

Input Screenshot

User is **entering a student's name** (e.g., "Alice") to fetch their profile from Google Sheets. This shows how the **input process works**.

Output Screenshot (Learning Plan Generation)

The system generating a **personalized learning plan** for the student based on their profile (e.g., Alice is 10 years old, grade 5, interested in Math and Art). This screenshot shows part of the **generated learning plan** with topics, activities, and recommended resources.

Prototype Demonstration: Adapting the Learning Plan

```
Alice cannot study on Tuesday as she has piano lessons |
Enter your feedback to modify the plan (or type 'done' to finish): (Press 'Enter' to confirm or
'Escape' to cancel)

Interrupt  Restart  Clear All Outputs  Go To  Variables  Outline  ...

ing Plan Generator!

d: {'Name': 'Alice', 'Age': 10, 'Grade': '5th', 'Interests': 'Math, Art', 'Challenges

plan...

ice:

an for Alice**

11:30am (Math)
ion to fractions
fraction worksheets (Equivalent fractions, Comparing fractions, Simplifying fraction
uction to Fractions (Math is Fun website) & 'Fraction Action' book by Loreen Leedy
```

User Feedback Input

The user gives feedback to modify the learning plan. This screenshot illustrates the feedback loop.

```
- Topic: Understand the concept of fractions by using various objects around them

**10:30 AM - 11:00 AM:** Break

**11:00 AM - 12:30 PM:** Art - Sketching Basics

- Topic: Introduction to different types of lines and angles in arts

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**Tuesday:**

**Day off for piano lessons**

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**Wednesday:**

**9:00 AM - 10:30 AM:** Mathematics - Types & Conversion of Fractions

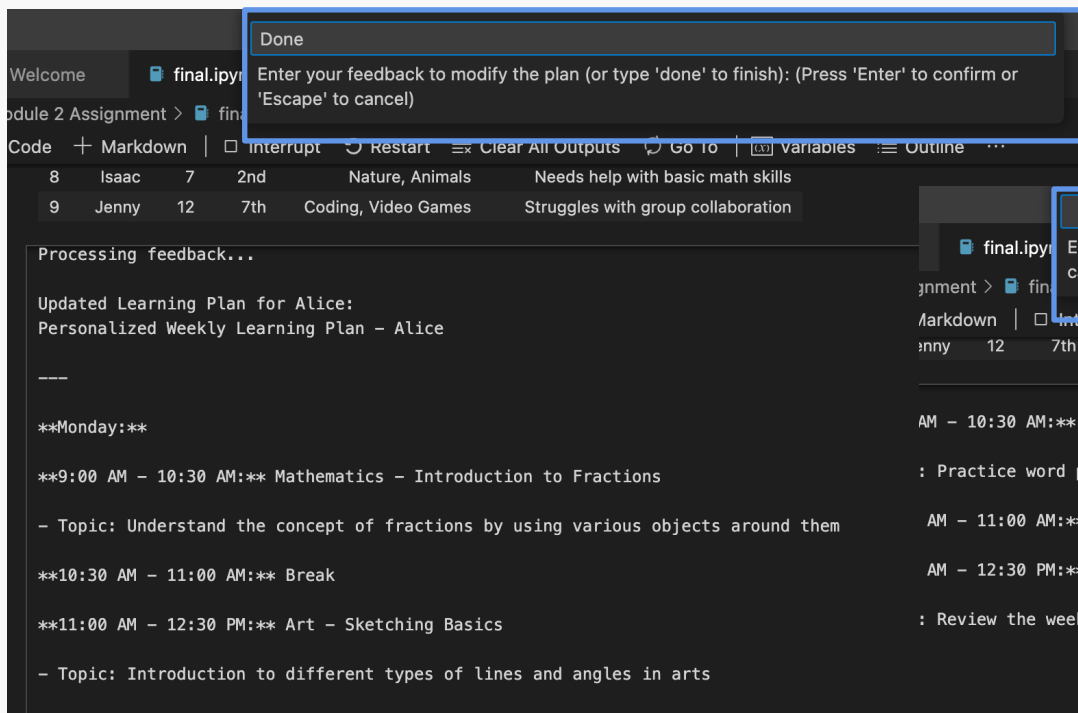
- Topic: Learn about different types of fractions and how to convert them
```

Updated Learning Plan

The modified learning plan after the AI has processed the feedback. The lessons for Tuesday has been shifted .

Prototype Demonstration:

Final Learning Plan and Feedback Iteration



```
Welcome | final.ipynb
Module 2 Assignment > | final.ipynb
Code | + Markdown | | Interrupt | Restart | Clear All Outputs | Go To | Variables | Outline |
8 Isaac 7 2nd Nature, Animals Needs help with basic math skills
9 Jenny 12 7th Coding, Video Games Struggles with group collaboration

Processing feedback...

Updated Learning Plan for Alice:
Personalized Weekly Learning Plan - Alice

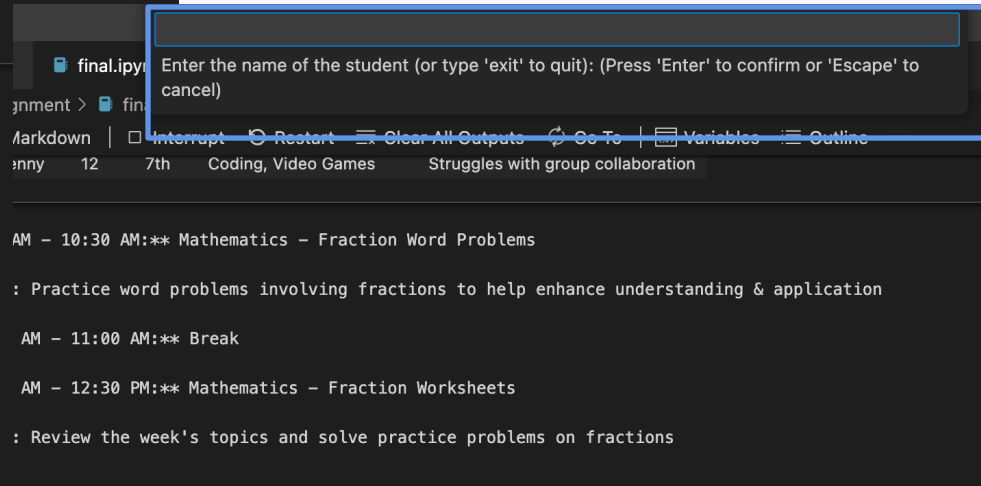
---

**Monday:**

**9:00 AM - 10:30 AM:** Mathematics - Introduction to Fractions
- Topic: Understand the concept of fractions by using various objects around them

**10:30 AM - 11:00 AM:** Break

**11:00 AM - 12:30 PM:** Art - Sketching Basics
- Topic: Introduction to different types of lines and angles in arts
```



```
final.ipynb
Module 2 Assignment > | final.ipynb
Markdown | | Interrupt | Restart | Clear All Outputs | Go To | Variables | Outline |
Jenny 12 7th Coding, Video Games Struggles with group collaboration

AM - 10:30 AM:** Mathematics - Fraction Word Problems
: Practice word problems involving fractions to help enhance understanding & application

AM - 11:00 AM:** Break

AM - 12:30 PM:** Mathematics - Fraction Worksheets
: Review the week's topics and solve practice problems on fractions
```

The user is **confirming that they're done modifying the plan** or iterating further based on additional feedback or **can ask the learning plan for another student.**

Key Features and Solutions of the Learning Plan System

Value Proposition

Efficiency Gains

Automates learning plan creation, saving time for teachers and administrators to focus on student engagement.

Cost Reductions

AI-driven plan generation reduces manual effort, cutting costs on administrative tasks and resources.

Customer Satisfaction

Personalized, engaging plans meet students' learning needs, improving satisfaction and outcomes.

Scalability & Flexibility

Scalable solution with easy expansion as student numbers grow; integrates seamlessly with Google Sheets.

Solutions

Personalized Education:

Automates personalized learning plans for each student, ensuring plans are tailored to individual needs.

Efficiency and Time Savings

Saves valuable time by automating plan creation, allowing focus on high-impact student interactions

Increased Engagement:

Boosts student engagement by delivering plans customized to their interests and learning pace

Implementation Challenges

Data Accuracy

Relies on accurate, up-to-date student data.

Mitigation: Regular data audits to ensure consistency.

System Integration:

Challenges if using platforms other than Google Sheets.

Mitigation: Develop flexible integration options and explore API solutions.

Feedback Handling:

Poor or unclear feedback can cause plan modifications issues.

Mitigation: Provide clear feedback guidelines and user training

Scalability:

Increasing student numbers may impact performance.

Mitigation: Monitor performance and use cloud scaling solutions.



Key Implementation Risks and Mitigation Strategies



User Adoption

Resistance to new AI-driven systems.

Mitigation: Offer training and user-friendly interfaces.:



External Dependency

Reliance on Google Sheets and OpenAI API.

Mitigation: Have backup plans and alternative solutions



Data Privacy

Concerns over student data security.

Mitigation: Implement encryption, secure authentication, and compliance with data laws.

Thankyou!

