

# 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

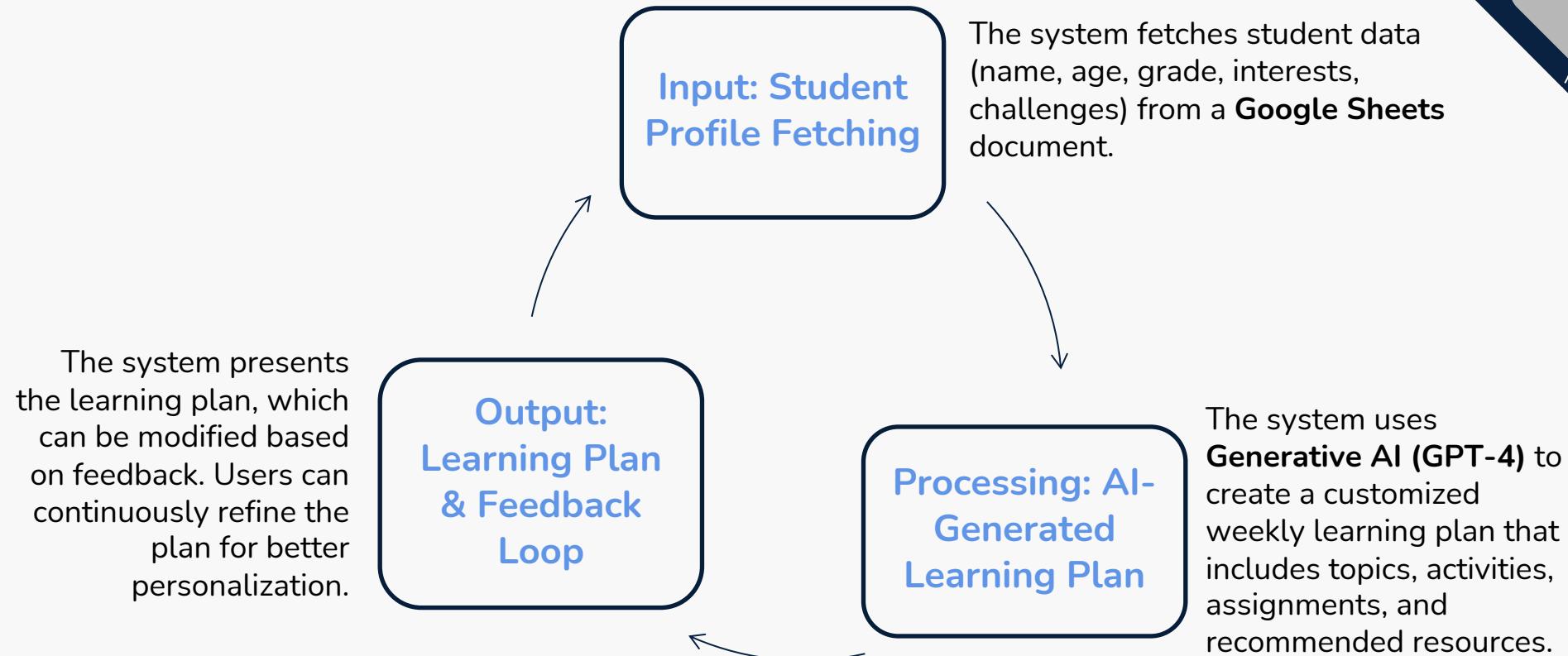
## Expected Impact

Enhanced Engagement

Improved Learning Outcomes

Efficiency Gains

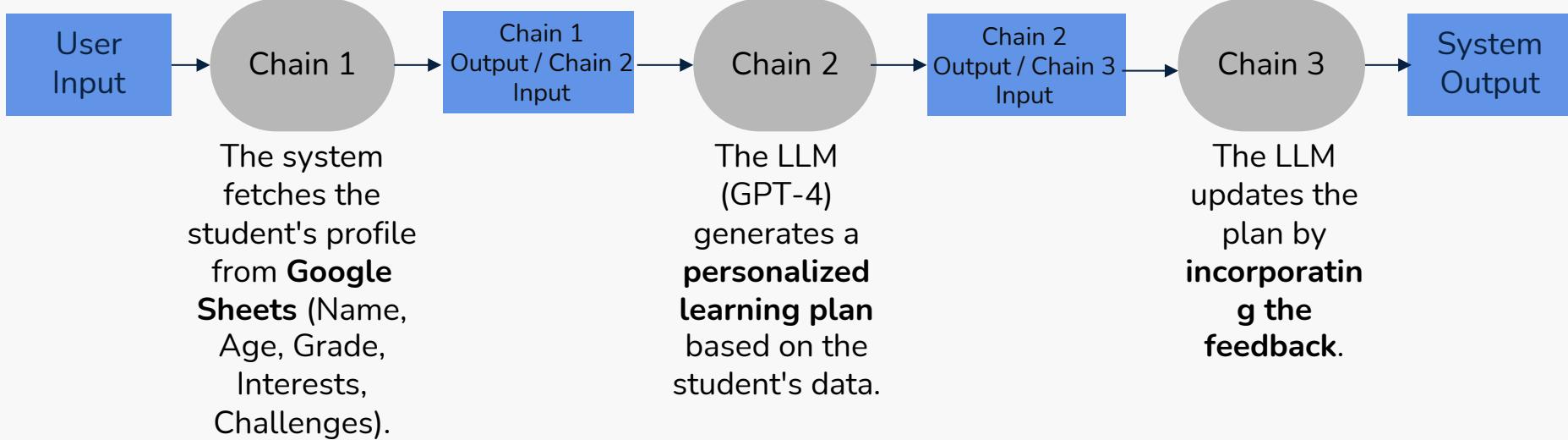
# How the AI Solution Works: Workflow Overview



# System Functionality: Data Input, Processing, and Output



The user enters the student's name.



# Prototype Demonstration: Generating a Learning Plan

A screenshot of a Jupyter Notebook interface. At the top, there's a text input field with "Alice" typed into it, with a placeholder "Enter the name of the student (or type 'exit' to quit): (Press 'Enter' to confirm or 'Escape' to cancel)". Below the input field is a code cell containing Python code. The code imports modules, defines a function `adapted\_plan` that updates a `learning\_plan` based on a `student\_profile`, and calls a `feedback\_loop`. It also includes a check for the main module and runs an interactive workflow. The output cell shows the message "Student Profiles Loaded Successfully!" followed by a table of student profiles.

	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

## 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**.

A screenshot of a terminal window titled "Welcome to the Learning Plan Generator!". It displays a student profile for "Alice": Name: Alice, Age: 10, Grade: 5th, Interests: Math, Art, Challenges: Struggles with fractions. The terminal then generates a learning plan for Alice, starting with a weekly summary and then detailing daily plans for Monday and Tuesday. Each day includes a time slot, topic, activity, and resource recommendation. Finally, a general reminder is provided at the end.

```
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. Enjoy your learning!
```

## 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 ...  
ng Plan Generator!  
d: {'Name': 'Alice', 'Age': 10, 'Grade': '5th', 'Interests': 'Math, Art', 'Challenges':  
plan...  
ice:  
an for Alice**  
  
1:30am (Math)  
on to fractions  
fraction worksheets (Equivalent fractions, Comparing fractions, Simplifying fraction  
ction 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  
---  
**Tuesday:**  
**Day off for piano lessons**  
---  
**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

The screenshot shows a learning plan application interface with two modal windows open.

**Top Modal (Focused):**

- Header: Done
- Text: Enter your feedback to modify the plan (or type 'done' to finish): (Press 'Enter' to confirm or 'Escape' to cancel)
- Background: Shows a learning plan for Isaac (8 years old, 2nd grade) with interests in Nature, Animals, and Coding, Video Games. He needs help with basic math skills and struggles with group collaboration.

**Bottom Modal (Background):**

- Header: final.ipynb
- Text: Enter the name of the student (or type 'exit' to quit): (Press 'Enter' to confirm or 'Escape' to cancel)
- Background: Shows a learning plan for Jenny (9 years old, 7th grade) with interests in Coding, Video Games, and Struggles with group collaboration.

**Left Panel (Learning Plan Content):**

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

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!

