



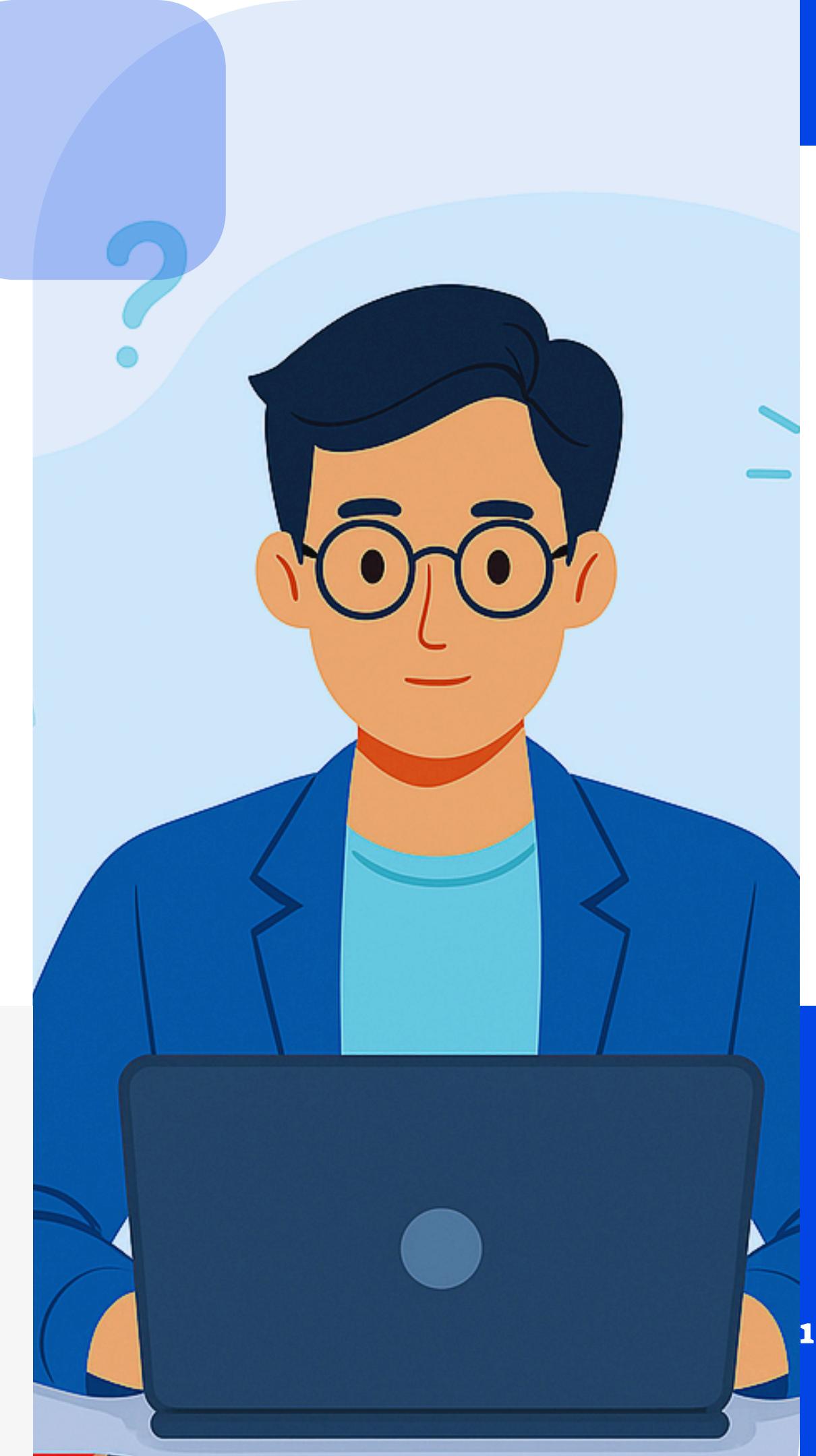
# PEDAGOGICAL TRAINING

June 2025

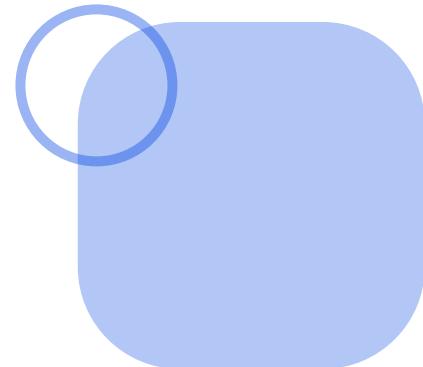
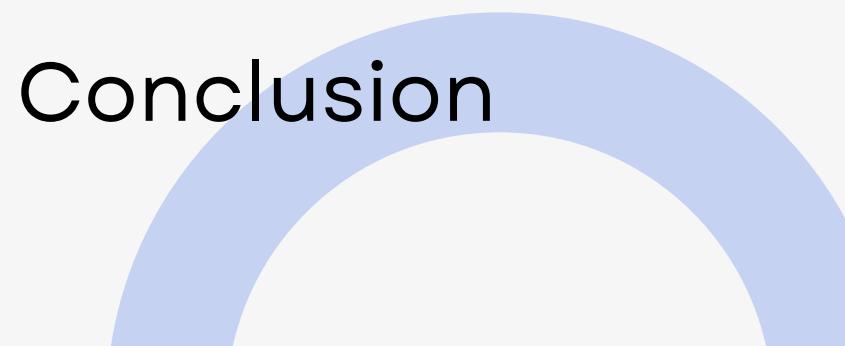
Capstone project 25-2-D-17

Celin Asadi & Anood Naem

Supervisor: Dr. Natali Levi-Soskin



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# PROBLEM DEFINITION



Schools today face big challenges with classroom behavior. Many new teachers find it hard to deal with students who don't pay attention, talk during lessons, or don't respect them. This makes teaching difficult and stressful, and sometimes causes teachers to leave the job. In their studies, they didn't get enough help or practice to prepare them for real situations, so they start teaching without feeling ready or confident.

# EXISTING SOLUTIONS

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**Teacher training programs**



**Professional Development Workshops**



**Pedagogical Mentorship**



**Simulation Tools - SimSchool**

# COLLABORATION WITH PEDAGOGICAL MENTOR :

## COLLABORATION WITH MENTOR



- Grades 3–6: behavior issues
  - Lacking classroom training
  - Low teacher confidence
  - No real-time practice
  - Need for emotional feedback
- 💡 Insights helped shape our solution

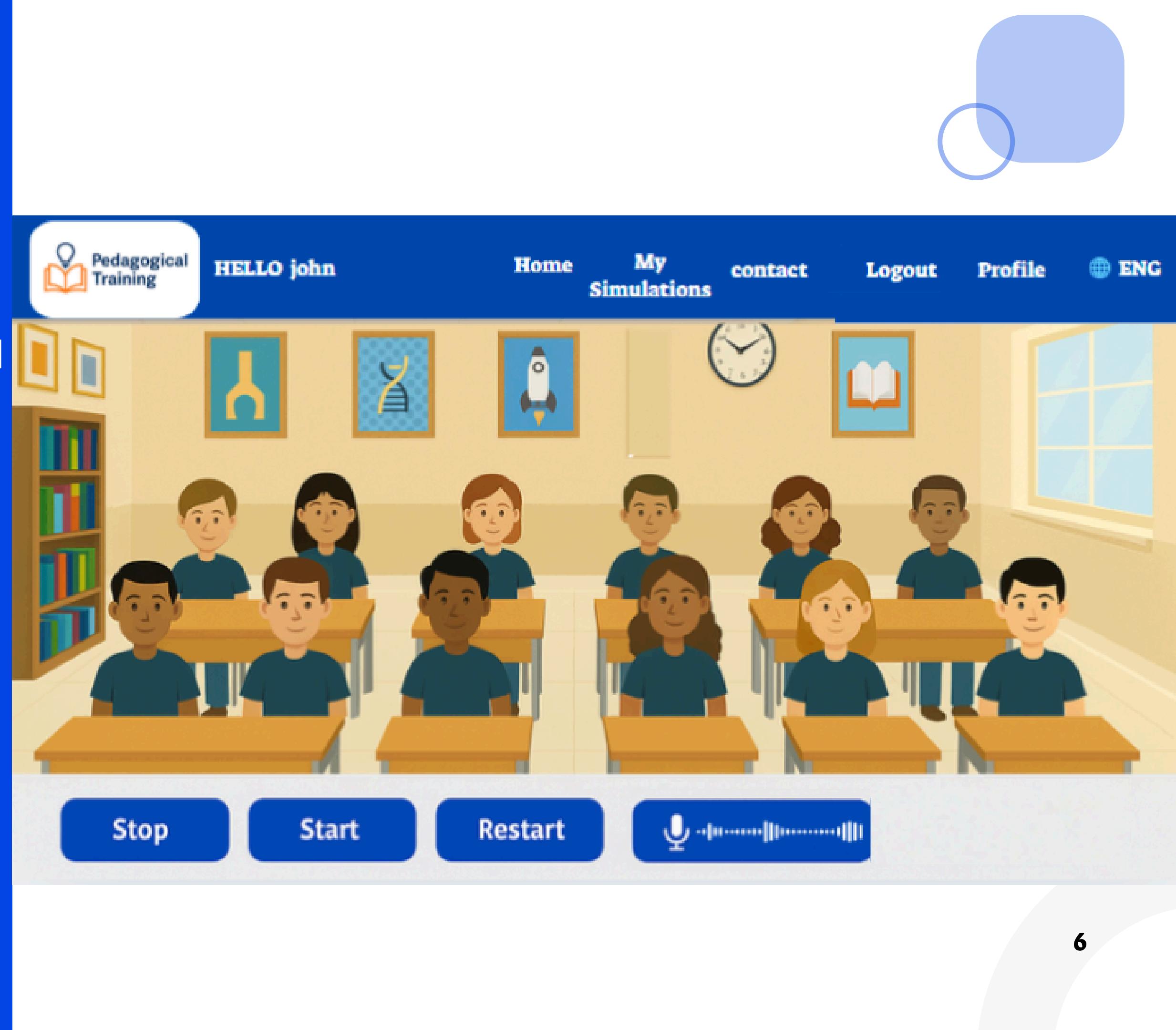
# OUR SOLUTION

We developed an interactive simulation for new teachers to practice managing classroom behavior in a realistic, voice-based environment.

The virtual class includes 32 students with diverse behavior types based on real classrooms.

Teachers respond by voice to disruptions, and the GPT engine adapts to their tone and content.

After each session, they get instant, personalized feedback to improve their skills and confidence.



# THE VIRTUAL CLASSROOM

Built a 3D interactive classroom

- ◆ Teachers can move desks & students
- ◆ Tools we used:
  - React Three Fiber (3D in React)
  - Three.js (3D graphics)
  - Drei (ready-made helpers)
  - TransformControls (move objects easily)



Why?

Fast to build, smooth performance, realistic experience

# ALGORITHM STEPS:

Voice Emotion:

-  Splits speech & detects emotions (calm, angry...)

Speech-to-Text:

-  Converts voice to best matching sentence

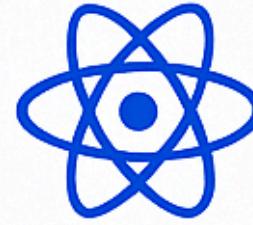
NLP Analysis:

-  Understands meaning, tone & style using GPT

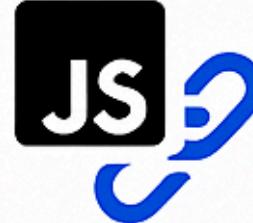
Feedback:

-  Gives a score
-  Adds suggestions
-  Shows progress

# TOOLS & TECHNOLOGIES



**React.js**



**Node.js & Express**



**Google Speech-to-Text**



**openSMILE**



**MongoDB**



**TEXT-TO-SPEECH**



**OpenAI GPT API**

# REQUIREMENTS

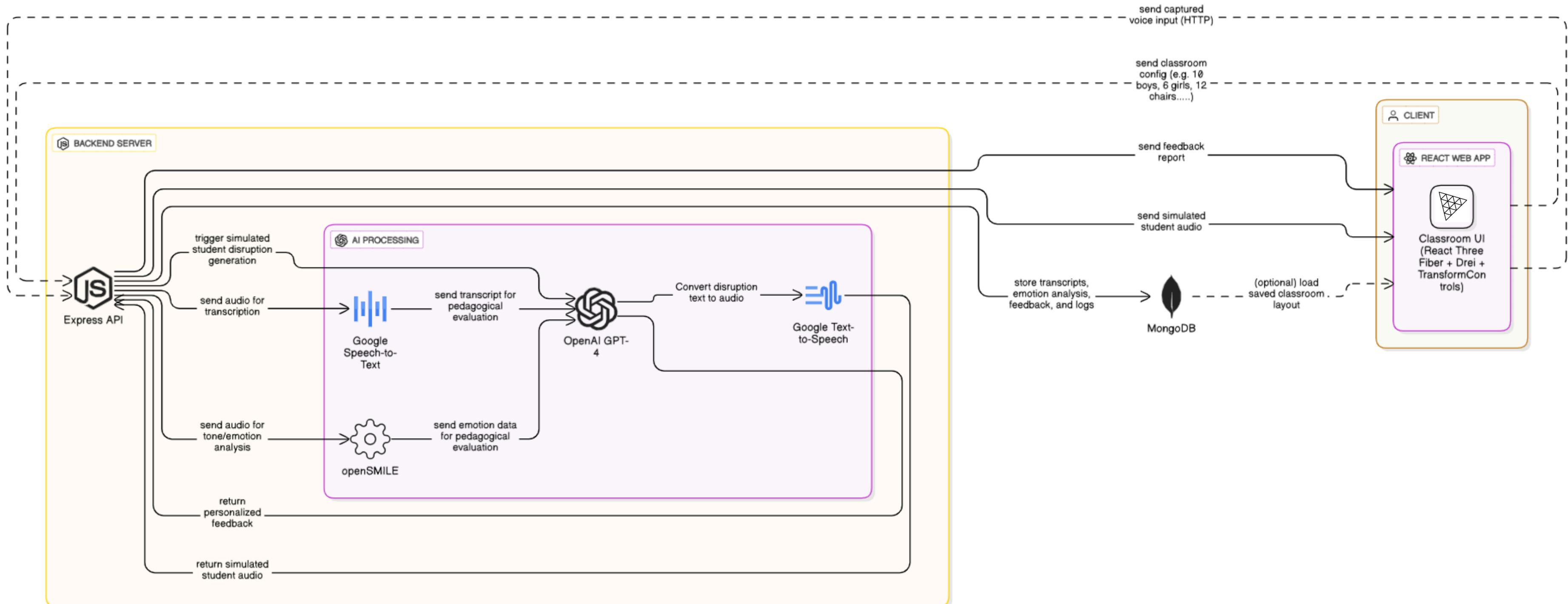
## 🔧 Functional:

- The system allows practicing behavior handling with voice
- The system allows analyzing tone, intent & style
- The system allows getting instant feedback

## ❖ Non-Functional:

- Supports Hebrew / English / Arabic
- 24/7 access
- Easy-to-use interface
- No voice saved – full privacy

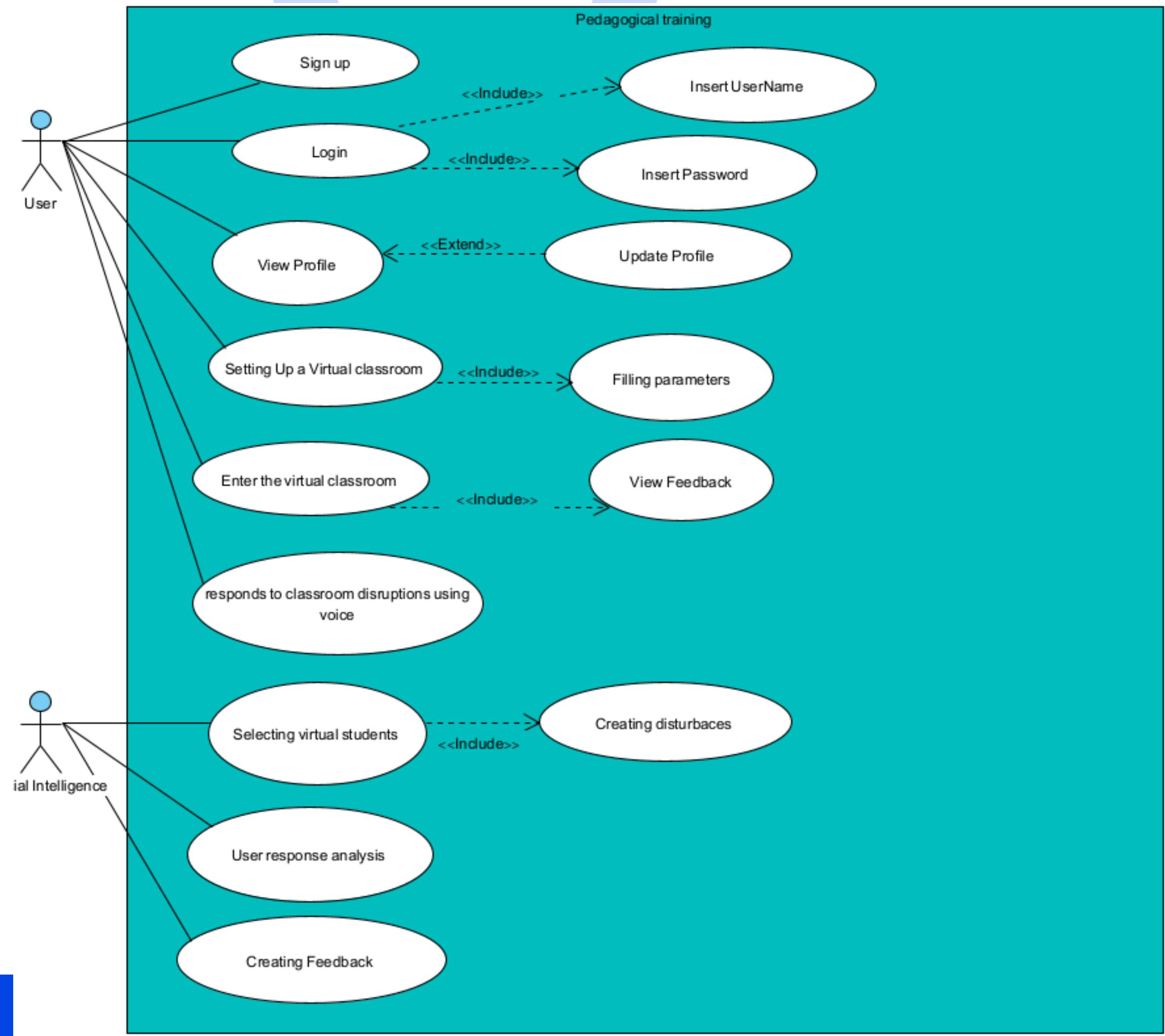
# SYSTEM ARCHITECTURE



# UML DIAGRAMS



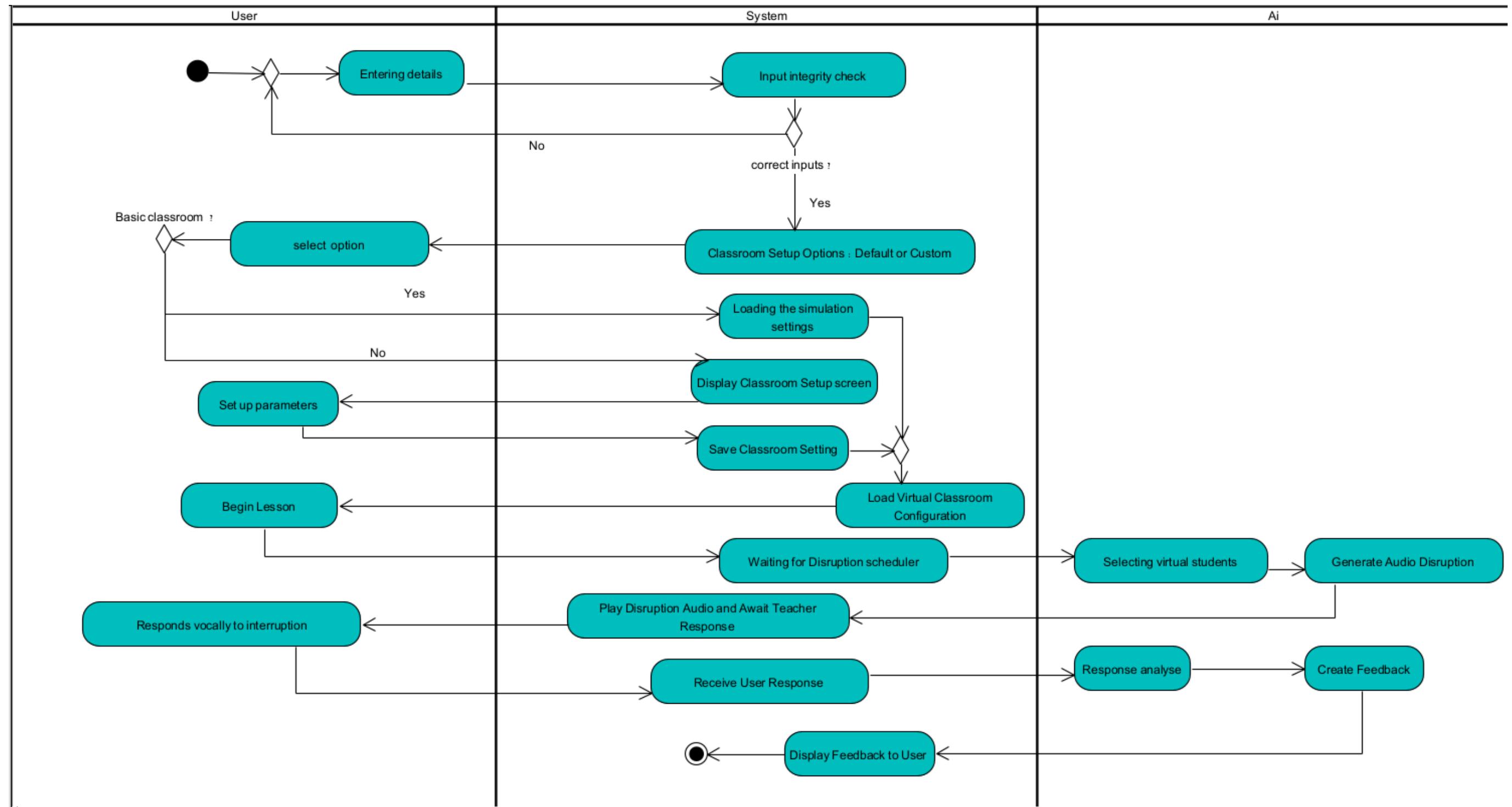
USE Case Diagram :



# UML DIAGRAMS



Activity Diagram :



# CONSTRAINTS & CHALLENGES

 Realism vs. Technical Limits

 Voice Input Complexity

 User Diversity

 Fair & Objective Evaluation

 Avoiding AI Bias

 System Integration & Performance

# Evaluation & Verification



Teachers tested in realistic simulations



Voice responses analyzed for tone & intent



Goal: 85% find feedback helpful



Real-world pilots & full user testing



Components (speech, emotion, feedback) tested separately



End-to-end and automated tests .



Focus: Stable and accurate performance

# Core System Tests

Test ID	Module	Action/Input	Expected Result
1	Voice Analysis	User speaks clearly into microphone	Accurate transcription and emotion detection
2	Simulation Page	User says angrily “Sit down already!”	Student behavior worsens; feedback suggests calmer response
3	Feedback Page	Submit verbal response	Feedback includes strengths, weaknesses, and improvement suggestions
4	Login Page	User enters valid username and password	Redirects to Main Menu

# CONCLUSION



- ✓ New way for teachers to practice behavior management
- ♫ Speak freely in real classroom-like situations
- 🤖 Get instant GPT-based feedback
- 💪 Builds confidence and readiness
- 🚀 Strong potential to help teachers grow



# **THANK YOU**

FOR YOUR ATTENTION

June 2025