🎓 Interactive 2D Teacher – Game Design Document (GDD)

1. Vision

A 24/7 interactive 2D teacher that teaches children (6+) and adults in real-time through animations, live2d-based characters, and responsive explanations. Unlike static video lessons, this teacher reacts dynamically to questions, homework, and concepts with animated demonstrations.

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2. Core Features

1. Interactive Teacher Character

live2d-based animations (talking, writing, pointing, explaining, conducting experiments etc).

Expression system (happy, serious, thinking, excited).

Preloaded Live2d charater motions for common teaching tasks.

2. Lesson Delivery

Teaches subjects: Math, Science, Biology, History, etc.

Can animate live explanations (writing on virtual board, showing charts, running science experiments).

Step-by-step breakdowns of concepts.

3. Student Interaction

Text Input: Students type questions.

Voice Input/Output: Converts student voice to text, teacher replies with voice + animation.

Homework Scanning: Students upload images of notes, textbooks, or homework. Teacher reads and explains them.

Quizzes & Exercises: Teacher gives tests, evaluates answers, and animates explanations.

4. Dynamic Media Generation

Images (diagrams, illustrations) generated or preloaded to assist explanations.

Teacher character integrates these into explanations.

5. Content System

Live2d character with motions and data files are stored in local device or in

website and only llm processing is down in cloud for low GPU/bandwidth usage.

Subject-specific animations mapped to keywords or explanation triggers.

Scalable so new lessons and animations can be added easily.

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3. User Flow

1. Student logs in (guest or account).

2. Chooses subject/asks a question.

3. Teacher:

Reads input (text/voice/image).

Processes and prepares an explanation.

Shows animated explanation with voice + live2d with lips sync + diagrams.

4. Student can:

Ask follow-up questions.

Take a quiz/test.

Upload notes for personalized teaching.

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4. Systems Needed

1. Frontend System

Web interface with character animation player.

Input methods: text, voice, file upload.

Lesson/quiz dashboard.

Responsive design for mobile + desktop.

2. Backend System

Handles user sessions & storage.

Maps queries to explanations + appropriate animations.

Stores and retrieves specialized user datas, images, and learning materials.

Runs AI logic (dialogue, recognition, generation).

3. Animation & live2d System

Pre-labeled live2d motions of teacher actions (talking, teaching, pointing, explaining experiments etc).

Animation controller (switches motions, lips sync, triggering etc based on context).

Cloud-hosted assets and llm for efficient delivery.

4. Voice System

Speech-to-text (for student questions).

Text-to-speech (for teacher’s voice).

Sync lip/mouth animations with teacher’s dialogue.

5. Image & Document System

Optical recognition (read notes, textbooks, homework).

Diagram generation or retrieval.

Integration with teaching flow.

6. Knowledge & Reasoning System

Module for handling questions, explanations, and logical reasoning.

Can fetch live information if needed (browser-like ability).

Converts concepts into step-by-step explanations.

Ask quations to the user in middle of the explanations for better engagment like a real teacher.

7. Evaluation System

Auto-generate quizzes based on lesson.

Grade student answers.

Provide animated corrections.

studies student phycology and categories them for personalised teaching styles.

8. Monetization System

Free tier: ads + limited lessons.

Subscription: unlimited lessons + premium features.

Institutional deals: classrooms, schools, e-learning platforms.

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5. Art & Style

Character: Cute, professional 2D teacher (temporarily using hiyori momose live2d character).

Environment: Minimalist classroom background.

Animation Style: Smooth mesh transitions, no heavy rendering.

Tone: Friendly, patient, educational.

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6. Scalability

Can start with a few subjects or general (Math, Science).

Add more subjects + animations over t