Building a Custom GPT Assistant for Asynchronous Student Learning

By
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Lecturer, Manufacturing Engineering,
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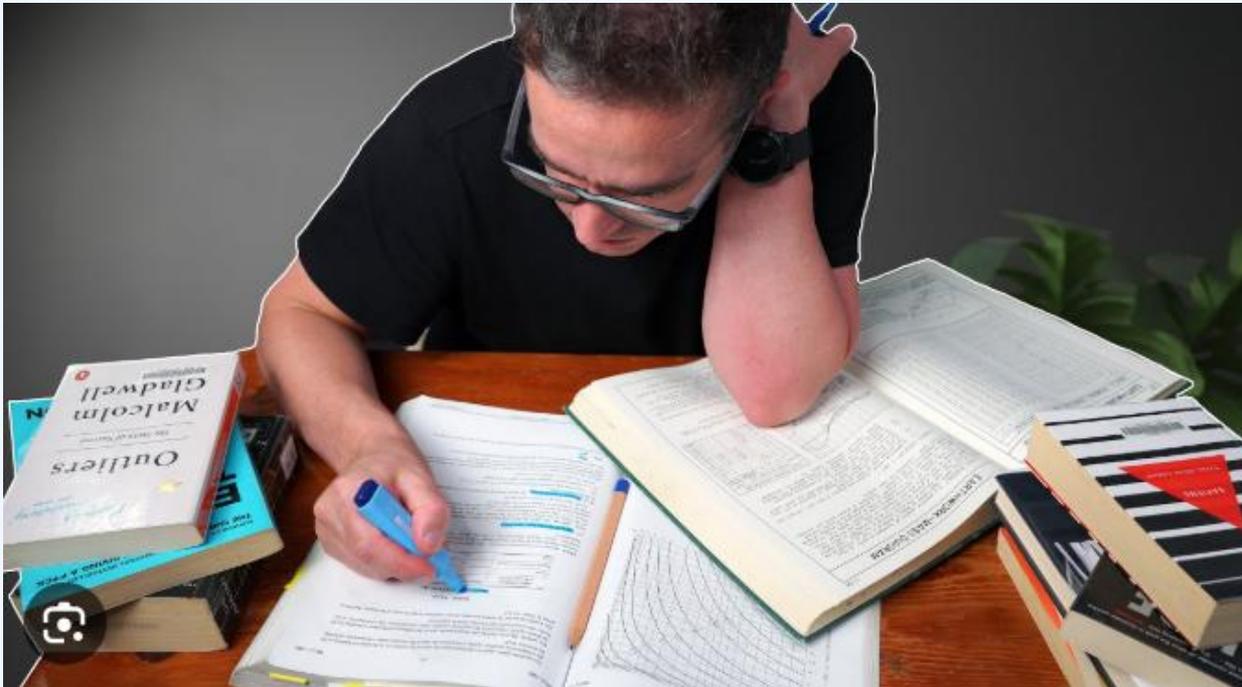Texas State University, San Marcos, Texas

Objectives   **AI – Artificial Intelligence**

Concept: - Background of AI-Assistant

Example:- Functioning of Custom GPT for ENGR 2300

Implementation: - Construction of ENGR2300 Tutor

Reflections: - Benefits and Shortcomings

Background of AI Assistant

Definition:
An AI Assistant is a Custom GPT that interacts with students through natural language to provide explanations, guidance, feedback, and learning support.
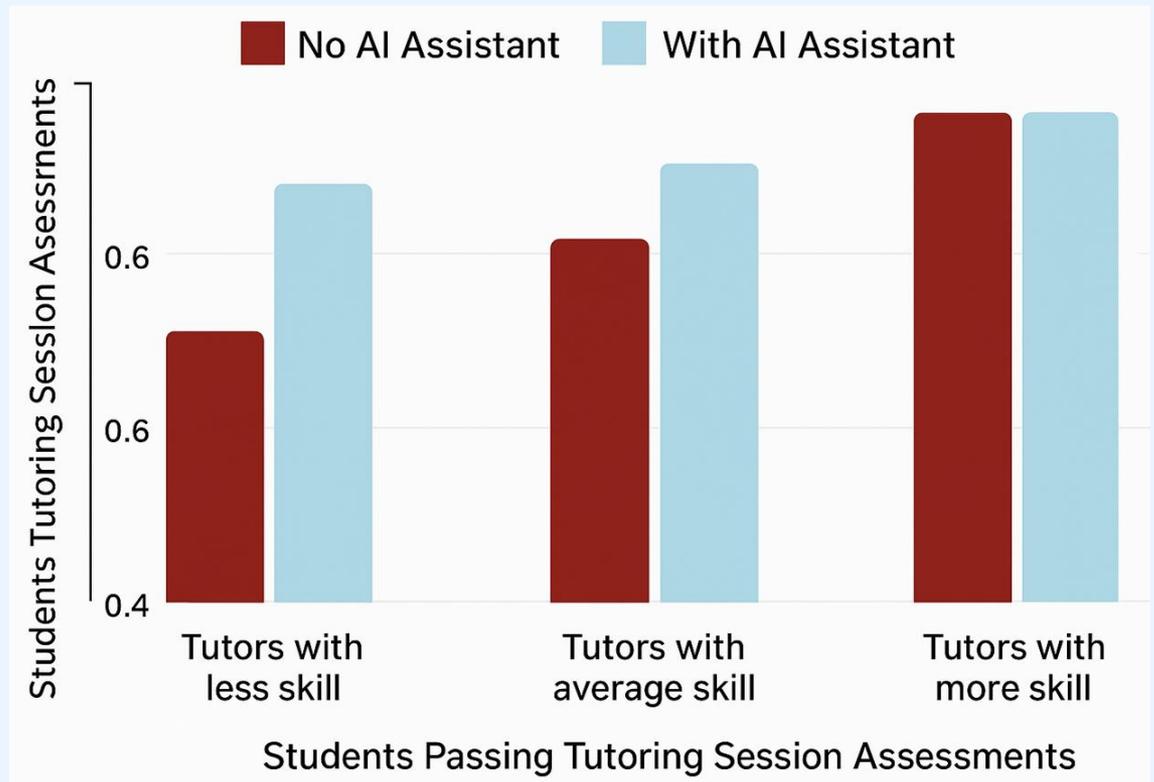**Key Characteristics:** Available **24/7**
Conversational interaction (students ask questions naturally)
Provides explanations, examples, and step-by-step help
Adapts responses based on student questions
Functions as a **supplementary tutor**, not a replacement for faculty

G – Generative
P – Pre-Trained
T - Transformer

Students Passing Tutoring Session Assessments

Why Asynchronous Learning Needs AI?

Current Teaching Challenges

Large class sizes

Limited office hours

Diverse student preparation levels

Students study at different times

Immediate doubt resolution is rarely available

Student Reality (Especially Engineering Students)

Study late evenings/weekends

Need instant clarification during problem solving

Hesitate to ask "basic" questions publicly

Role of Asynchronous AI Tutor

Provides help **anytime, anywhere**

Reduces learning interruption

Supports self-paced learning

Reinforces classroom teaching outside class

LLM: A **Large Language Model (LLM)** is an **artificial intelligence system trained on massive amounts of text data to understand, generate, and reason using human language**.

https://disprz.ai/blog/synchronous-vs-asynchronous-learning

PROS ✔
- ☐ Real-time Interaction
- ☐ Peer Collaboration
- ☐ Structured Format
- ☐ Higher Engagement
- ☐ Shared Understanding
- ☐ Behavioral & Soft Skills

CONS ✖
- ☐ Scheduling Challenges
- ☐ Limited Flexibility
- ☐ Lower Retention
- ☐ Scalability Trade-offs
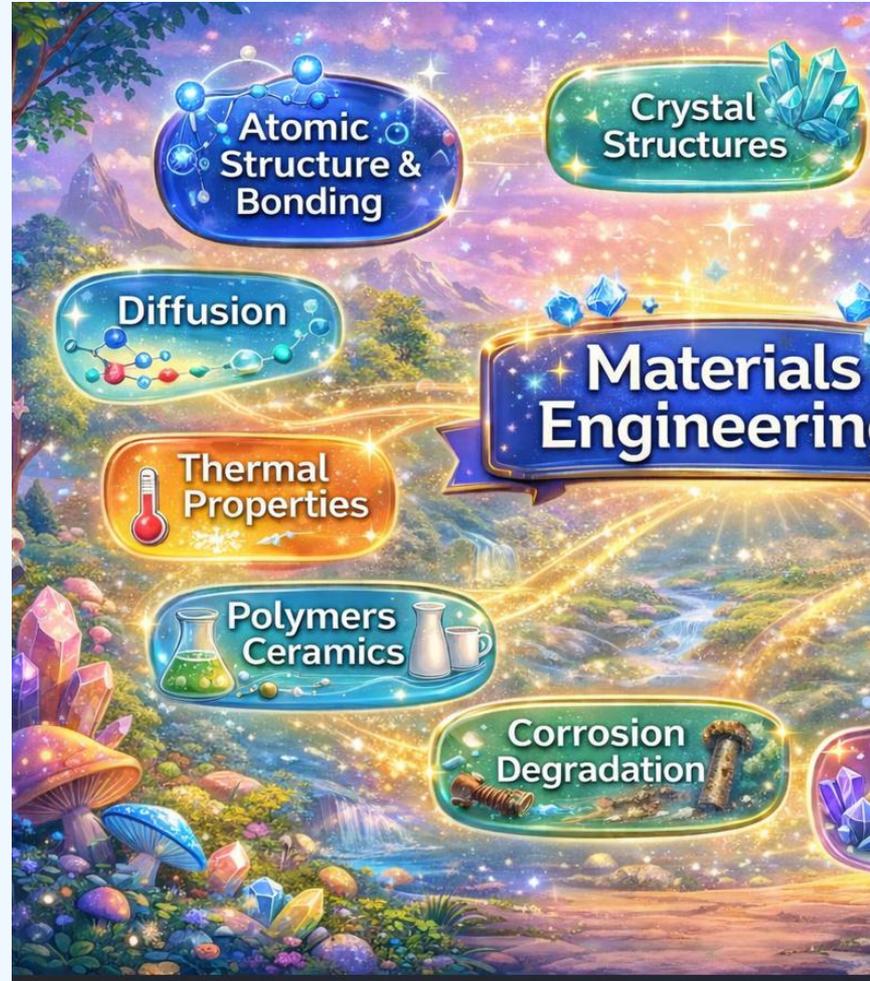- ☐ Uneven Participation
- ☐ Dependence on Delivery

ENGR2300 Course Context

ENGR2300 is Materials Engg

This course is Fundamental to Mechanical Engineering

There are about 20 Chapters (300 Book Pages)

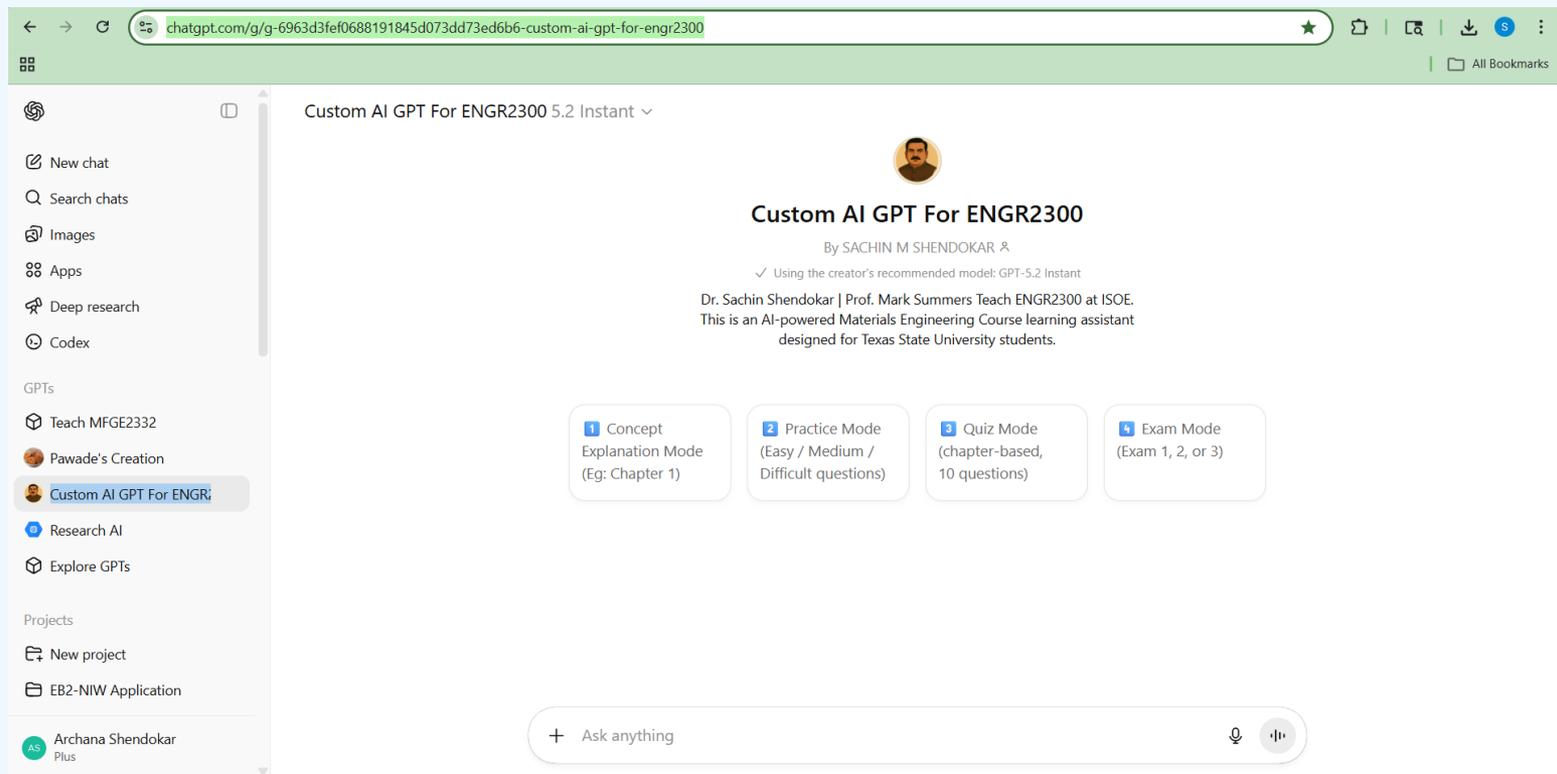Topics range from Processing, Structure, Properties, Application, and Development of New Materials

Agentic: Ability to act independently, make decisions, and take goa

Steps to Build a Custom GPT

Define learning goals and tutor personality
Upload course materials, Design structured prompts
Test and refine using student interaction, Deploy for asynchronous learning

https://chatgpt.com/g/g-6963d3fef0688191845d073dd73ed6b6-custom-ai-gpt-for-engr2300

ML: Learning based on data – it could be text, voice, vision/motion, time

Advantages of Custom GPT Tutors

24/7 learning availability, Personalized explanations
Unlimited practice generation, Supports diverse learners
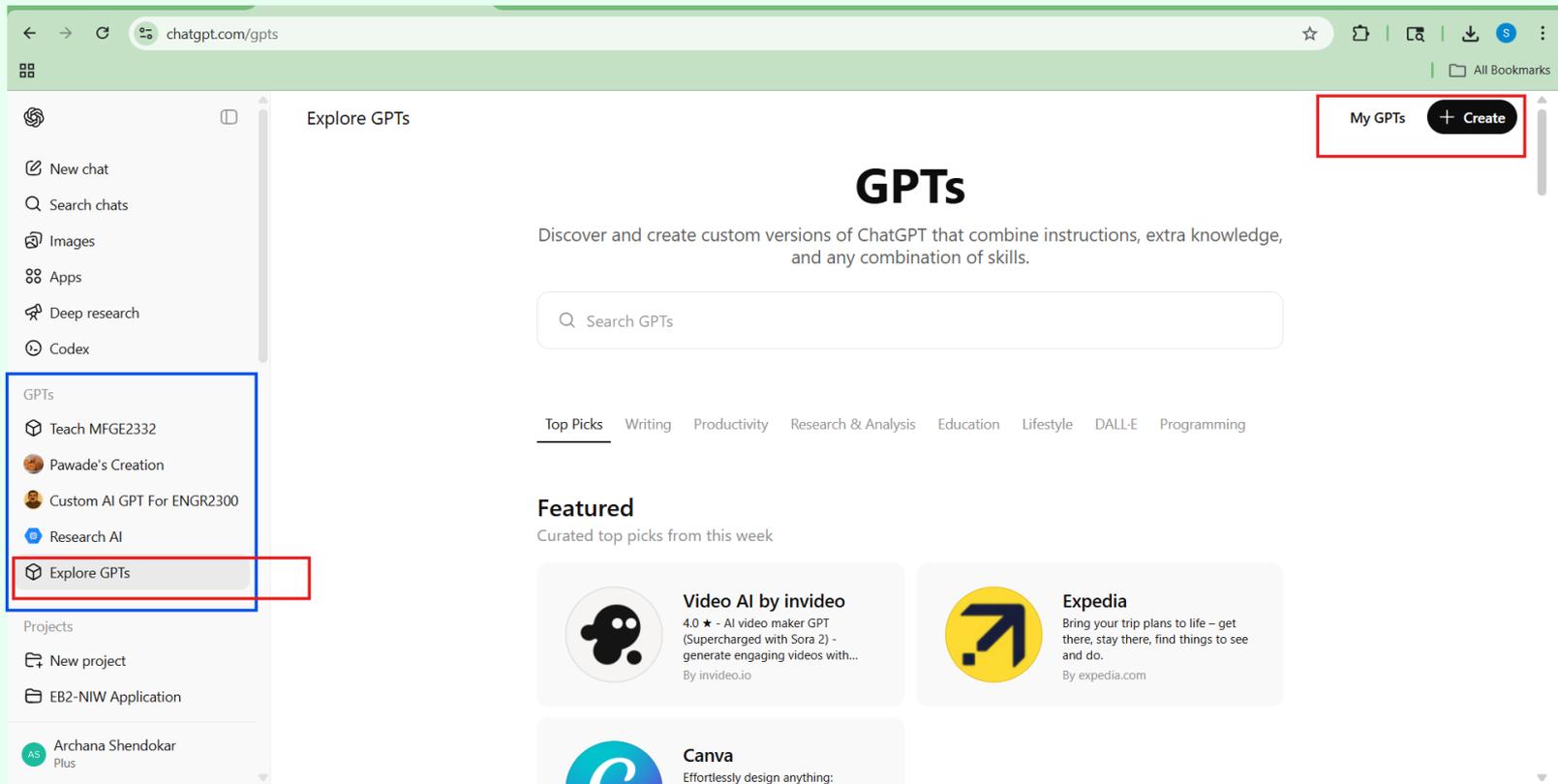
DL: Deep Learning beyond classical statistical level as in Neural Networks

Limitations and Challenges

Occasional incorrect responses

Requires instructor validation

Platform usage constraints

Human mentorship still essential

Students Motivation for Self-Learning

Vibe-Coding

Implementation Strategy

Pilot with one module
Collect student feedback
Integrate quizzes and assignments
Continuously improve prompts
Utilize Custom-GPT for Assessment

Prompt Engineering

Conclusion

AI enhances—not replaces—educators
Scalable personalized engineering learning
Supports asynchronous education
Prepares AI-ready workforce
To enhance student engagement, streamline administrative tasks, and personalize learning experiences.

Thank You – AI ?

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Transformation in Education
with AI and Advanced Technologies

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