GenAI in Learning, Teaching and Assessment

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Why is the instructor using GenAI for learning and teaching?

Walter and his colleagues in AF at The Hong Kong Polytechnic University (PolyU) are exploring GenAI through a collaboration called EduSynergy, which includes TeachAssist AI and LearnMate AI. The aim is to address fundamental challenges in higher education: improving teaching efficiency and providing scalable, personalised student support.

EduSynergy seeks to leverage AI to handle routine tasks—such as foundational knowledge instruction—via TeachAssist AI, freeing teachers to focus on complex, interactive, higher-order teaching activities. In parallel, LearnMate AI is designed to offer students 24/7 academic assistance, delivering a level of support not feasible with human resources alone. The initiative aligns with PolyU's vision to be a part of the global digital transformation in education and to validate a next-generation, AI-enabled educational model.

How is GenAI applied in this scenario?

In this initial phase, GenAI is being used to build a functional demonstration of EduSynergy's dual-track system. Current development priorities include:

TeachAssist AI:

Trained on a limited set of PolyU course materials (including AF5344), this model demonstrates its ability to deconstruct textbooks, generate preliminary teaching aids, and produce interactive Q&A scripts. In future, each teacher will be able to train TeachAssist AI for their own subject, incorporating their teaching style and materials.

LearnMate AI:

This prototype showcases the potential for personalised tutoring. It uses a defined knowledge base to answer students' questions and simulates basic one-to-one learning interactions, giving each student access to a designated subject professor and round-the-clock learning support.

Core technologies under development include a structured content-deconstruction tool and a cross-disciplinary knowledge-graph engine. The next phase will refine these models through iterative testing with PolyU faculty and students, as well as other interested universities, to collect data for full model training and validation.

What is the potential impact on student learning?

As the project is in its early development phase, the most significant impacts are projected outcomes based on benchmarks from similar global ed-tech initiatives (such as those reported by HolonIQ) and form the targets for this project. The immediate impact is on design and validation. PolyU students and teachers will be engaged as key partners in testing the prototypes, providing crucial feedback to shape the AI's development and ensure it effectively reduces cognitive load and enhances learning outcomes.

What challenges may arise during implementation, and what solutions will be used?

At this early demonstration stage, the primary challenges relate to the development cycle—specifically, post-training and parameter adjustment of large language models (LLMs), integration into a cohesive system, and significant upfront development costs.

Key challenges and solutions include:

Challenge 1:
High upfront development costs. Research, development, and computational resources for training and fine-tuning specialised LLMs represent a substantial initial investment.

Solution:
We are mitigating financial pressure by applying for teaching-innovation grants and leveraging government and institutional funding targeted at AI in education. This supports sustainability without compromising our technological goals.

Challenge 2:
LLM optimisation and alignment. Generic LLMs require extensive post-training and meticulous parameter tuning to accurately interpret and process specialised academic content across diverse disciplines (e.g., engineering versus business).

Solution:
We are adopting an iterative feedback loop. The core development team conducts technical fine-tuning, while PolyU's cross-disciplinary faculty partners provide domain-specific validation. They review AI outputs for accuracy and pedagogical soundness, creating targeted datasets for continuous model refinement and alignment.

Challenge 3:
System integration and workflow design. Integrating TeachAssist AI and LearnMate AI into a single ecosystem (EduSynergy) and defining how they interact with existing university systems and teaching workflows is complex.

Solution:
Leveraging PolyU's expertise in educational technology, we are designing the system architecture and user interfaces to ensure the platform is powerful, intuitive, and additive to existing teaching and learning practices without being disruptive.

Challenge 4:
Building trust and defining roles. Addressing initial scepticism about AI's role is crucial for adoption.

Solution:
Transparent communication and the live demonstration are key. We emphasise that the AI is an assistive tool designed to augment—not replace—educators. Co-creation with faculty is fundamental to building trust and ensuring the technology serves their goals.

The EduSynergy project is currently in its demonstration and testing phase. PolyU faculty and students are invited to follow the project's progress. Registration for the beta test will open soon, offering the PolyU community the opportunity to explore how AI can advance teaching and learning.