

Synergising Human Expertise and Generative Artificial Intelligence for Curriculum Design

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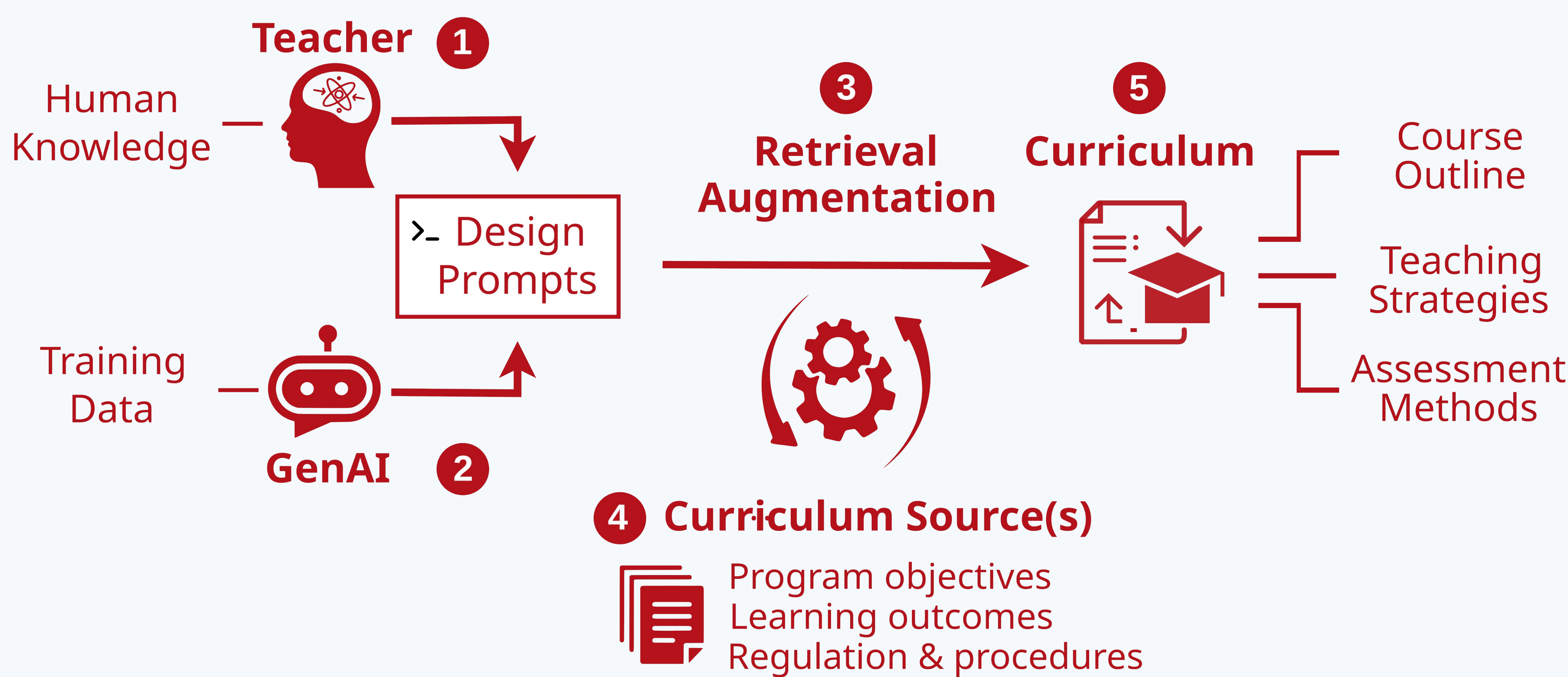
MOTIVATION

- ▶ University programmes see **constant evolution of curricula**
 - ▷ influence of professional organizations (e.g., ACM, GI)
 - ▷ national initiatives such as the UK's 2014 computing reform
 - ▷ university quality assurance measurements
- ▶ Revisions of curricula involve **repetitive, text-heavy tasks**
 - ▷ learning outcomes
 - ▷ competency statements
 - ▷ assessments
- ▶ **Strong potential for automation** through computer-assisted text processing

PROJECT GOALS

- ▶ To put a **Generative AI system** to action that will
 - ▷ provide automated curriculum templates
 - ▷ assists in learning outcome alignment
 - ▷ streamlines course redesign for consistency across disciplines & international campuses of the Global Lancaster network
- ▶ To investigate **potential and limitations** of Generative AI in curriculum design by conducting an empirical study on its role in enhancing student experience, flexible academic structures, and inclusive curriculum development
- ▶ To validate the **human-AI collaborative approach** for curriculum design, adapting existing tools to improve accuracy, inclusivity & sustainability in course development, while addressing ethical, privacy & pedagogical concerns

Solution Overview



Evaluation

- A Case Study
 - B Prototype
 - C Usability Analysis
- ✓ Ethical Guidelines
 - ✓ Academic Regulations
 - ✓ User Feedback

METHODOLOGY & OUTCOMES

- ▶ **Key technologies** for prototype development
 - ▷ Large language models (LLM), i.e., the Llama 3 family
 - ▷ Retrieval-Augmented Generation (RAG) to help minimise bias and hallucination in curriculum generation by grounding the output in diverse and factual sources, such as existing curricula, related manuals and guidelines
- ▶ **Empirical evaluation** to support educators make informed decisions
 - ▷ effectiveness of using AI in curriculum design
 - ▷ limitations
 - ▷ potential improvements
- ▶ **Anticipated outcomes** of the project include
 - ▷ Publication(s) and solution prototyping
 - ▷ Technical report and workshop (demonstration and outreach)
 - ▷ Competency development for AI-driven education pedagogy

CONCLUSIONS & OUTLOOK

- ▶ An AI-based prototype will help **streamline curriculum design**, enhance personalization, and maintain pedagogical alignment
- ▶ Benefits include time savings, but risks like privacy, copyright, bias & environmental impact demand **responsible deployment**
- ▶ Insights will be shared with the educational communities to foster collaboration and **innovation in AI-driven education**

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