# Towards Educator-Driven Tutor Authoring: Generative AI Approaches for Creating Intelligent Tutor Interfaces.

## Summary:

This paper presents an AI-enhanced tool designed to help educators create intelligent tutoring systems (ITSs) without needing advanced technical skills. The tool integrates generative AI, specifically Large Language Models (LLMs), to automate the generation of tutor interfaces based on high-level input from educators. The system allows for the generation of both complete interfaces and individual components, providing a balance between automation and user control. The authors conducted a preliminary study comparing the AI-enhanced tool to a classical approach, finding significant reductions in the time and effort required to create tutor interfaces, particularly for complex designs. While the results suggest that the tool can enhance efficiency, the paper also raises questions about how best to integrate such tools into educators’ workflows and the impact on interface quality. Future research is proposed to explore these areas further and to assess the tool’s effectiveness in real-world educational settings.

## Analysis Criteria:

### What is the context of use for the technology? Consider the people, the setting, and the circumstances of use.

1. People (Users)

- Primary Users: The main users of the AI-enhanced Tutor Builder are educators who are interested in creating Intelligent Tutoring Systems (ITSs) but may not have advanced technical skills in programming or interface design.

- Secondary Users: Indirect users might include students who interact with the tutors created using this technology and possibly administrators or IT staff who support the educators in implementing these tools.

2. Setting

- Educational/ Workplace Environment: The primary setting is within educational institutions—schools, colleges, universities, and potentially training centers. Educators use this tool in environments where there is a need to create personalized learning experiences.

3. Circumstances of Use

- Design Process: Used during the design and customization of ITSs, particularly during planning, curriculum development, or ongoing course adjustments.

### What are the methodologies used to create and study the technology?

1. Development Methodologies

- Generative AI and Prompt Engineering: Utilizes Large Language Models (LLMs) like GPT-4, with prompt engineering to generate tutor layouts and content based on educator input.

- Defining a Domain-Specific Language (DSL): A compact DSL was created to represent tutor interface layouts, which facilitated efficient communication with the LLM and ensured consistency in the generated output.

- Integration with Existing Tools: Built on the Apprentice Tutor Builder (ATB) platform, ensuring seamless integration of new AI capabilities without disrupting existing functionality.

2. Evaluation Methodologies

- Preliminary Comparison Study: The authors conducted a small-scale comparative study to evaluate the efficiency of the AI-enhanced Tutor Builder against a classical approach. This involved:

### Discuss some of the design choices made in creating the technology, including whether accessibility, inclusivity, and sustainability where considered the design

1. Accessibility Considerations

- User-Friendly Design for Non-Technical Educators:

- The primary audience for this tool includes educators who may not have a background in programming or interface design. The design choice to use a drag-and-drop interface and automated layout generation helps make the technology accessible to these users, lowering the barrier to entry for creating intelligent tutors.

2. Inclusivity Considerations

- Broad User Base:

- The design of the Tutor Builder aims to include educators from diverse backgrounds, not just those with technical expertise. By removing the need for programming skills, the tool supports inclusivity, allowing a wider range of educators to participate in the creation of intelligent tutoring systems.

3. Sustainability Considerations

- Efficiency and Resource Use:

- The paper mentions efficiency gains in interface creation, particularly in terms of time and keystrokes. While this increases productivity, it also potentially reduces the overall energy consumption associated with extended development times, contributing to sustainability in a small but meaningful way.

### Describe one way in which the technology can be improved.

Screen Reader Compatibility improvement

- Improvement: Ensure all interface elements are fully compatible with screen readers to enable visually impaired educators to use the tool effectively.

- Implementation: Incorporate ARIA (Accessible Rich Internet Applications) attributes in the generated HTML, ensuring all interactive elements are labeled and accessible via screen readers.

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