Evaluating Student Agency in AI-Generated Lesson Plans

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Introduction

Generative AI in Education

AI-generated lesson plans offer speed and convenience for educators, but often lack pedagogical depth, cultural relevance, and responsiveness to diverse student needs.

Why Student Agency Matters

Student agency is vital for developing lifelong learners and is a core component of AI literacy and competence (OECD, 2019; UNESCO, 2024).

Research Gap

Few studies have examined how student agency is supported or hindered in AI-generated lesson plans.

Our Contribution

This study investigates the extent to which student agency is embedded in lesson plans generated under four conditions—two commercial AI tools and two custom-designed workflows.

Method
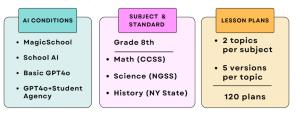
AI Conditions Compared

We compared two commercial AI tools with two GPT-4-based generators.

Subjects & Standards

120 lesson plans were generated across Grade 8 math, science, and history using topics from CCSS, NGSS, and NY State standards.

Coding

Plans were coded for the presence (1) or absence (0) of 11 student agency constructs.

AI CONDITIONS	SUBJECT & STANDARD	LESSON PLANS
• MagicSchool • School AI • Basic GPT4o • GPT4o+Student Agency	Grade 8th • Math (CCSS) • Science (NGSS) • History (NY State)	• 2 topics per subject • 5 versions per topic 120 plans

Framework

Based on a literature review (e.g., Aldi et al., 2018; Vaughn, 2020), we synthesized a framework with three dimensions and eleven constructs.

Dimension	Key Construct
Dispositional	Authentic Problems
	Goal-directed
Motivational	Make Choices
	Take Actions
	Problem Solving
	Self-Efficacy
Positional	Interaction
	Collaboration
	Opportunities to Share Ideas
	Play Different Roles
	Share Authority

Findings

Student agency in AI-generated plans

- Teacher-centric structure
- Unbalanced construct coverage
- Patterned use of constructs

Enhancing agency through prompt design

- Encourage self and peer assessment, enabling students to take on diverse roles.
- Offer more resources and choices, such as presentation formats and research topics
- Promote goal-setting and community-connected reflection

Science example: Natural Selection and Adaptations

Conclusions

- Current AI-generated lesson plans show significant gaps in supporting student agency.
- Educators should engage with AI tools critically and intentionally.
- Developers must collaborate with educators and learning scientists to embed core educational values.
- Future research should explore ways to diversify perspectives in AI tools and address cultural relevance.

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