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Educating in an Era of Continuous Change

From idea to classroom: Accelerating bespoke educational tool creation through vibe coding

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The democratisation of educational technology development through generative artificial intelligence (GenAI) is reshaping how educators design bespoke learning tools. This presentation chronicles the emergence of vibe coding, an approach where subject-matter experts (SMEs) exchange natural-language prompts with GenAI models to translate pedagogical ideas directly into functional software, thereby lowering cognitive load and enabling rapid experimentation (Erez & Hazzan, 2025).

In a 2025 case study, an immunology lecturer with no programming background produced a broad suite of HTML5 simulations for 2nd-year students, serving as a powerful example of cross-disciplinary potential. Simple activities moved from concept to classroom in fifteen minutes; richer interactions took two to three hours. The simulations serve three purposes: a virtual laboratory reinforcing key principles, a work-integrated resource linking theory with professional practice, and a formative assessment tool providing instant feedback. Development required no external support, licences, or IT approvals, illustrating how cloud-based GenAI can bypass traditional bottlenecks.

This case exemplifies the TPACK (Technological Pedagogical Content Knowledge) framework (Archambault & Barnett, 2010), demonstrating how GenAI can bridge the gap for educators with deep pedagogical and content knowledge but limited technical expertise. The approach aligns with research positioning natural language as the key interface between pedagogy and code (Plate & Hutson, 2024), effectively removing technical barriers to accelerate prototyping (Hare, 2024; Keith et al., 2025). Unlike conventional no-code platforms, the GenAI method offers near-unlimited customisation, making the educator's pedagogical intent, not the platform's constraints, the primary driver of tool design.

The four-phase development process was driven by pedagogy: (1) conceptualisation grounded in constructivist learning objectives; (2) iterative prompting; (3) rapid prototype testing; and (4) classroom deployment. The resulting tools were designed to reduce extraneous cognitive load for students, allowing them to focus on core concepts through active experimentation. Across all stages, the educator's disciplinary expertise, rather than programming skill, determined success.

The finished simulations exhibit functionality that would normally demand months to years of professional work. Beyond access to Google AI Studio, cost was negligible, aligning with evidence that GenAI tools deliver significant productivity gains (Ziegler et al., 2024) and enable the creation of high-quality learning objects with minimal resources (Trčková et al., 2024). Formal student feedback and learning-outcome analysis are scheduled to quantify the impact on engagement and comprehension.

Maintenance and sustainability issues emerged, particularly for newcomers. However, exemplar prompts and peer mentoring quickly mitigated these challenges. The ability to visualise ideas within minutes also promises to enhance traditional workflows by enabling SMEs to communicate nuanced requirements to developers. Ethical considerations, including data privacy and model transparency, will be addressed to ensure robust governance.

Institutional implications are substantial. By shifting educators from consumers to creators, GenAI functions as a cognitive amplifier for non-technical staff, fostering a culture of iterative digital pedagogy. Leaders will need policies that safeguard equitable access, privacy, and sustained professional development. This presentation offers practical guidance for educators, strategic insights for administrators, and new directions for researchers studying GenAI-pedagogy intersections, highlighting the shared responsibility of educators and institutions to steer this

transformation toward sustainable and high-quality educational outcomes.

Keywords: artificial intelligence, educational technology development, natural language programming, vibe coding, generative AI.

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