

Moving Beyond the Comfort Space: Exploring the Potential of Gen AI to Support Higher Education Instructors Successfully Implement Universal Design for Learning

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Abstract

This paper showcases work in progress currently being carried out to explore ways generative artificial intelligence (Gen AI) can support post-secondary instructors. The study is taking place on a campus located on the west coast of Canada. The research question explores the degree to which Gen AI can effectively support instructors' reflections around UDL implementation, beyond what they might consider through a reflective redesign process on practice. The methodological approach selected is participatory action research; an instructor is collaborating with two graduate students to review the learning activities and assessment tasks present in two Masters of Education courses taught by the principal investigator. The team is using prompt engineering to explore ways to implement Universal Design for Learning (UDL) more widely within these components. The Gen AI solutions are being reviewed collectively for their fitness to purpose: a set of graduate students participants having taken these courses in the past will later be selected to offer feedback as to whether the versions of the courses redeveloped with Gen AI more effectively meet the needs of diverse learners. It is hoped that the study will highlight the degree to which instructors can rely on Gen AI to explore UDL in more depth and select strategies that otherwise remain outside of their habitual zone of comfort in relation to inclusion.

Key Words: Accessibility, Generative AI, higher education, inclusion, inclusive design, diverse learners, UDL

Context

Universal Design for Learning (UDL) has attracted growing interest in higher education as a framework to manage learner diversity that does not rely on deficit model practices that can otherwise stigmatize these learners (Burgstahler, 2015). UDL focuses instead on an initial inclusive design/redesign to meet the needs of all diverse learners, rather than on retrofitting or accommodations. While UDL initiatives are multiplying across North American campuses, there is also an acknowledgment that UDL implementation is more complex than initially envisaged. There are, in particular, many complex ecological variables which negatively impact instructors' goals and intentions with UDL (Fovet, 2020).

Many instructors in higher education perceive UDL implementation as an onerous process for which they have insufficient resources. All the while, Gen AI is fast revolutionizing the post-secondary landscape and there is excitement as to how it might support instructors within their T&L reflection. Some scholars argue that Gen AI could support educators' efforts with UDL implementation. However emerging UDL chatbots have been disappointing (Ruiz-Lázaro et al., 2024). This study begins the process of building a body of evidence around what effective prompt engineering for UDL purposes may look like.

This project seeks to carry out the systematic redesign of two MEd courses which the investigator has taught in past semesters, using AI to develop rich and diverse ways to apply UDL to both class activities and assessment tasks. It examines to what extent AI can creatively, powerfully, and cost-effectively support an instructor in systematically integrating a UDL redesign lens into the format of the two Masters courses selected. The research question explores the degree to which Gen AI can effectively support instructors' reflection around UDL implementation, beyond what they might consider through a reflective redesign process on practice.

Literature Overview

Universal Design for Learning (UDL) initiatives have multiplied in North America over the last decade (Almeqdad et al., 2023), as an innovative framework to move educators away from deficit model practices that otherwise significantly limit the impact of inclusive practices and policies (Burgstahler, 2015; Dalton et al., 2019). It achieves this shift because it translates the social model of disability into hands-on teaching and learning strategies. The social model positions disability as a construct and argues that it is distinct from impairment and in fact is the product of clash between diverse individual embodiments and designs that are not inclusive (Mole, 2013). UDL translates the social model into classroom practices (Fovet, 2014) by encouraging the instructor to see student diversity as a given and to focus on their role to design proactively for this diversity. UDL therefore focuses on an initial inclusive design/ redesign to meet the needs of all diverse learners, rather than on retrofitting or accommodations (Kumar & Wideman, 2014).

While UDL initiative are multiplying across North American campuses (Baumann & Melle, 2019; Ismailov & Chiu, 2022; Kennedy et al., 2018; Singleton et al., 2019), there is also an acknowledgment that the process of UDL implementation is more complex than initially envisaged (Dacus-Hare, 2023; Vukovic et al., 2023). There are many stressors which hinder instructors' sometimes ambitious goals and intentions

with UDL (Zhang et al., 2024). Lack of time and limited opportunities to genuinely ‘think outside the box’ are often cited by faculty as to obstacles (Hills et al., 2022).

All the while, Gen AI has impacted the post-secondary landscape broadly and almost overnight, and, while there are considerable concerns in relation to this impact, there is also excitement as to how it might support instructors, particularly within their T&L practices (Ayala, 2024). Many scholars and practitioners have suggested Gen AI might support instructors’ efforts with UDL implementation and inclusive redesign (Bray et al., 2024; Saborío-Taylor et al., 2024; Song et al., 2024).

Theoretical Stance

The theoretical lens adopted by the study is a broad post-modern approach which unpacks the traditional discourse on disability perpetuated public media and societal perceptions, and instead considers it as a social construct (Carling-Jenkins, 2009). This post-modern reframing of disability supports the implementation of UDL within educational spaces (Fovet, 2014).

Methodological Process

The study adopts a broad participatory action research process and involves graduate students into the enquiry (Timmis, 2024). The project focuses on prompting a Gen AI software to redesign all unit activities and course assignments within the two graduate courses previously taught by the principal investigator (PI) – within an MEd program (Assessment and Evaluation, and Managing Multiple Systems: Theory and Practice, a course focused on inclusion. Once AI generated design solutions were produced, the PI, with the help of two research assistants (RAs), manually examined the pertinence and suitability of these AI generated UDL redesigns, in the context of: (i) the wider course objectives, (ii) the campus Equity, Diversity and Equity mandate, (iii) UDL literature, and (iv) other key SoTL theoretical paradigms. Prompt engineering was used reiteratively by the team to refine the pertinence of generated solutions.

Within these two courses, UDL had to a degree already been implemented by the PI; the aim was therefore to refine UDL implementation and advance it further than the intuitive initial inclusive design that might be part of the PI’s reflection on practice. Dimensions that were targeted included: (i) creating an effective and accessible balance between lecture-based sections of the classes and interactive constructivist group activities (representation); (ii) adding more agency and choice in assessment, beyond flexibility in submission formats (action and expression); and (iii) creating more windows for learners to shape ways outcomes are targeted (engagement).

Once this manual review of the UDL redesign solutions has been completed, participants who have taken the two courses in question will be sought within the MEd program. They will be invited to take part in individual semi-structured discussions where their feedback will be sought as to the way the UDL design solutions meet their expectations in relation to accessibility, design flexibility, and inclusion. This second phase - a process of triangulation - will begin in spring 2025.

Full ethics approval has been obtained from the Research Ethics Board of the campus within which this study is being carried out. The first phase of the project raises few ethical concerns as the students taking part in the prompt engineering around the Gen AI supported redevelopment of the core course activities are research assistants and co-investigators. Students taking part in the second phase of the project and in the review of the redesign have already completed the course and there are therefore few concerns around instructor-student power dynamics.

Initial Findings and Assertions

Early findings suggest that the participatory action research process used in this project does lead to significant improvement in the degree to which UDL is eventually embedded into the two courses, in the sense that accessibility improvements were made possible on the basis of the Gen AI tips generated; these UDL solutions went *prima facie* beyond the reflection the PI has already applied to the design of these courses. These initial findings can be broken down into three avenues of reflection: (i) a UDL redesign process can be supported by Gen AI, but it is clear that no simple, ready-made prompting is able to yield effective or meaningful UDL redesign suggestions; it is the collaborative, repeated refining of prompts in context that leads to pertinent design tips; (ii) the cyclical, reiterative process of refining prompts for Gen AI was effective because it was collaborative and dialogical in nature and included learner perspectives; and (iii) the process of prompt engineering for UDL solutions is effective but requires fine tuning that may be difficult to model, repeat, or sustain among faculty.

The process of participatory action research with students around inclusive design is innovative and will inform further research in the field, as student voice and agency have so far been insufficiently featured in UDL research (Fovet, 2018). The study also includes precedent-setting processes and the development of findings in relation to what constitutes effective prompt engineering for the purpose of a broad and rich reflection on UDL implementation in all dimensions of learning activities.

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