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Relieving instructor angst about inclusive design: Exploring the potential of gen AI to sustainably support the implementation of Universal Design for Learning

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The literature has established that if instructors shy away from implementing Universal Design for Learning (UDL) it is often because of lucid and tangible fears about workload. In parallel, the emergence of gen AI has immediately triggered hopes that large language models (LLMs) might be successfully used to support the challenging planning tasks of higher education instructors; it has immediately struck scholars that this might include supporting instructors who might have fears about workload and competencies in relation to UDL implementation in their classes. This study explored the degree to which an LLM could be effective in supporting an instructor redesign two Masters of Education courses in order to make them more aligned with UDL than they already were. The theoretical lens used in this project was the social model of disability. The methodological framework used was action research. The research team prompted the LLM for UDL strategies. A process of triangulation invited students having previously taken the courses to assess the effectiveness of the redesign. The findings suggest that gen AI can indeed support the UDL redesign of courses. Concerns are, however, raised because mastering the prompting competencies necessary may be as complex as the UDL redesign itself.

Keywords: UDL, gen AI, higher education, inclusive design, LLM

Introduction and Context

The literature has established that if instructors shy away from implementing Universal Design for Learning (UDL) it is often because of lucid and tangible fears about workload, amongst other complex ecological variables (Carol & Clancy, 2024; Hakel & Magin, 2024). In parallel, the emergence of gen AI has immediately triggered hopes that large language models (LLMs) might be successfully used to support the challenging planning tasks of higher education instructors (Evmenova, et al., 2024; Marchena Sekli et al., 2024); it has immediately struck scholars that this might include supporting instructors who might have fears about workload and competencies in relation to UDL implementation in their classes (Kalaigian et al., 2024; Song et al., 2024). UDL chatbots have instantaneously drawn attention and triggered hope in this regard (Ruiz-Lázaro et al., 2024; Engeness et al., 2025), but they have shown to be limited in their ability to generate effective hands-on UDL redesign strategies; the results remain generic tend to simply refer the user to the UDL Guidelines (CAST, 2025). This study explored the degree to which an LLM could be effective in supporting an instructor redesign two Masters of Education courses in order to make them more aligned with UDL than they already were. It used prompting of an LLM rather than a pre-designed chatbot focused on UDL.

Literature Review

Universal Design for Learning

UDL is a framework which seeks to translate the social model of disability into classroom practices (Fovet, 2014). The social model of disability suggests that disability is not a personal characteristic of the individual, but rather that it is a friction between personal embodiments and the design of environments, products, spaces, and experience (Almeqdad et al., 2023). The social model of disability places the emphasis on the role of the educator, who can support or disable learners through their design; it does not focus on learner exceptionality or diagnosis. UDL adopts this stance and encourages educators to redesign their teaching and learning to reduce this friction and offer inclusive experiences to the widest possible range of learners. It does so by offering educators three simple design principles (Moriña et al., 2025). 'Multiple means of representation' encourages educators to inject maximal flexibility in the way

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they offer material and information. ‘Multiple means of action and expression’ focuses on offering flexibility and choice in the ways learners participate in a classroom. ‘Multiple means of engagement’, similarly, supports educators as they seek to adopt less teacher-centric constructs of what learner engagement might look like (Zhang et al., 2023; Fovet, 2020).

UDL in Higher Education

UDL has initially been developed in the K-12 sector (Bray et al., 2024), but it has gained in momentum in the post-secondary sector, in most Global North countries, over the last decade (Fovet, 2020). Although initial interest was initially focused on undergraduate courses in Arts and Humanities, the momentum for UDL is now spreading across disciplines (Kirsch et al., 2024; Miller & Lang, 2016); it is also being explored in educational spaces beyond the lecture hall, such as labs, experiential settings, graduate supervision, etc. (Celestini & Palalas, 2024; Dempsey et al., 2024; Liu et al., 2024). The COVID pandemic and the overnight online pivot have significantly boosted interest in UDL, as these were circumstances where instructors became highly aware of their role as designers, of the range of their choices as designers, and of the impact of these decisions on learners (Fovet, 2022; Kennette & Chapman, 2024). The relevance of UDL in online and hybrid teaching has also become much more tangible of late (Altowairiki, 2024; Redstone & Luo, 2024). Instructor-led initiatives with UDL are growing globally and being documented through scholarship and publications; communities of practice are also springing up across the sector (Galvin & Geron, 2021). Despite this fast progress, there remain concerns about the ability of post-secondary institutions to adopt UDL in a systemic way; sustainable strategic roadmaps are yet to be developed when it comes to organizational management of change (Fovet, 2020).

Gen AI in Higher Education

Gen AI use has rapidly exploded in the post-secondary sector in the last five years (Yusuf et al., 2024). It has radically revolutionized academia’s stance towards large language models (LLMs) in the sense that these models now have the capacity to not just scan and identify information but also generate content, in ways that respond to predetermined critical parameters (Li et al., 2025). Most of the concerns related to this growth have been directed at student use, academic integrity, and assessment redesign (Zhang, 2025). However, it now becomes readily apparent that gen AI is also going to radically alter the way faculty approach their workload (Haroud & Saqri, 2025).

Gen AI and inclusive Design

One area where gen AI shows promising potential is the ability to support instructors as they reflect about accessibility and inclusion (Tishcoff et al., 2024). Some chatbots focused on UDL have in fact already been designed (Ruiz-Lázaro et al., 2024), but they show limited capacity to generate original curricular solutions. This paper therefore examines ways prompt engineering might lead to more pertinent gen AI supported solutions for UDL implementation.

Theoretical Stance

The theoretical stance adopted in this project is the social model of disability (Adam & Koutsoklenis, 2023). The social model of disability is a revolutionary theoretical paradigm that rejects bio-medical constructs of disability. Instead, it sees disability not as a personal characteristic, but rather as a friction, or lack of fit, between personal embodiments and the design of spaces, products, and experiences (Murza & Buckley, 2024). In the field of education, disability emerges from a clash between learner embodiments and the design of learning experiences or classroom practices (Davies & Soni, 2025). It is a transformational paradigm as it shifts the focus away from impairment or exceptionality and instead places the intentional design of the educator at the centre of the reflection on accessibility. It can be said that, in many ways, UDL translates the social model into action (Fovet, 2014).

Methodological Process

The methodological tradition selected for this project is action research. Action research is an enquiry process which focuses on matching strategic solutions to specific issues identified within organizational contexts (Berku, 2025). It is a process which is not necessarily focused on exploring a phenomenon or analysing data, but instead pragmatically seeks to identify solutions that demonstrate effectiveness in

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relation to solving a concern or challenge identified within a specific employment context (Anderson & Christens, 2025; Ronen, 2020). The use of action research is growing in the field of education, including within the post-secondary sector (Jensen & Dikilitas, 2023). Action research is particularly useful in creating a participatory flavour within an enquiry, and in engaging other employees beyond the investigator.

The principal investigator (PI) selected two Masters of Education courses he had taught in the past; these courses already included a degree of UDL design, but the PI felt that further implementation could be carried out on these courses. Ethical approval for this study was obtained within the university within which the PI teaches. Accompanied by two research assistants, the PI used prompting with an LLM to obtain several rounds of suggestions in relation to how to optimize UDL implementation within these two courses. Reiterative rounds of refining of the prompts were carried out through the process. The team then collectively manually filtered the gen AI suggestions to select the ones which were feasible to apply with this teaching context and its student population. The second phase of the study consisted in a triangulation process within which MEd students, having taken this course in the past with this instructor, were invited to participate and offer their evaluation of the redesign. Five participants took part in this triangulation process.

Findings

The project established that prompt engineering with an LLM could indeed support an instructor's reflection on UDL implementation to explore more redesign solutions more broadly and creatively than they would have done so on their own. The process of implementing UDL in all class activities, resources, and assignments could be made systematic and effective with this gen AI support. In this respect, therefore, the project succeeded in stretching the instructor's reflection on teaching and learning, and more specifically on UDL implementation.

The other key finding was the importance of student voice and agency in (i) developing pertinent prompting for the redesign, and (ii) identifying key elements of the course requiring more attention. It reinforces the notion that UDL implementation is perhaps best carried out collectively with learners, rather than in an insular fashion, as a sole instructor. In this sense, the participatory action research model used in this project sets a precedent for further collective enquiries with learners, but also encourages instructors to carry out this type of dialogue in each of their class.

The triangulation appeared to generally confirm the relevance and appeal of the gen AI supported redesign. It must be noted, however, that some friction was observed in this process and that students also worried in some cases about the additional workload some of the redesign might create. This observation is aligned with a wider reflection within the scholarship, in relation to the transitional friction which can occur when learners are transitioning from didactic models towards more autonomous and transformative pedagogies (De Witt et al., 2023).

Outcomes and Implications

The study seems to suggest that the potential of gen AI to support instructors in their efforts to implement UDL more widely and more effectively is tangible and requires further exploration. It is important to note, however, that this is not an automatic or automatized process, in any respect, and that the solutions were generated through careful, reiterative, and nuanced prompt engineering.

While the implications for the wider implementation of UDL in higher education are interesting and promising, it must be noted that prompt engineering is a skill that is as complex as the process of UDL redesign itself. It is not clear, therefore, whether this solution to UDL implementation is sustainable, time effective, or user-friendly for faculty. Many instructors are likely to require training in prompt engineering itself, before they can venture within this process. There are therefore training capacity implications for further education.

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It is also important to note that a manual filtering took place to select the gen Ai solution that were feasible within the teaching context at hand. This selection was made critically by the whole research team, using their collective understanding of UDL and degree of comfort with the model. It is therefore clear that prompt engineering in itself might be insufficient for an instructor within no – or little understanding of UDL – as they would not be in a position to critically discard solutions that were not pertinent in context. The study therefore reiterates the pressing need for UDL training and capacity building within the post-secondary sector.

The final implication is that such processes of reflection in relation to in-depth UDL implementation are optimally effective when carried out collectively with students. There has, however, to date been very little exploration of student agency and voice in relation to UDL implementation (Fovet, 2018). This hesitation of faculty, when exploring student voice, echoes what the literature highlights in relation curriculum co-creation more generally (Godbold et al., 2021).

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