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Enhancing Online Teaching Practice through Universal Design for Learning: A Faculty Professional Development Case Study in Adult Learning Contexts

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Abstract

This qualitative case study examines how faculty engaged with and applied Universal Design for Learning (UDL) principles through a professional development workshop series at Africa Nazarene University, Kenya. Fifty-two faculty members participated in the initiative, and data were generated through reflective feedback and focus-group dialogue, complemented by a small set of descriptive survey indicators. Using an inductive approach, the study collected data through open-ended survey questions, analysing responses through descriptive statistics (frequency and percentage analyses) and thematic analysis using Kirkpatrick's Four-Level Training Evaluation Model. The findings reveal that collaborative peer feedback cycles increased faculty confidence in implementing UDL principles and demonstrate how a systematic analysis of participant feedback can inform targeted professional development initiatives. The study provides a framework for using evidence-based continuous improvement strategies to enhance workshop design and learning outcomes in higher education settings. These insights contribute to the growing research on data-driven approaches to faculty development and inclusive learning design.

Keywords: Universal Design for Learning (UDL), online learning, higher education, faculty development, inclusive education

Introduction

The COVID-19 pandemic accelerated the global adoption of digital learning, compelling higher education institutions (HEIs) to reassess their course design, delivery, and assessment methods (Hassan, 2024). The rapid emergence of generative artificial intelligence tools has further disrupted education, presenting

additional challenges in online learning. These challenges were compounded by the lack of preparedness among Kenyan institutions, educators, and students (Obura & Emoit, 2024). Many educational establishments continue to struggle with implementing effective online learning practices that cater to the diverse needs of all students (Clarin & Baluyos, 2022; Turnbull et al., 2021).

Student feedback and online class evaluations reveal ongoing gaps in course content design, instructor presence, active learning strategies, student engagement, and infrastructural support (Martin et al., 2021; Stojan et al., 2022). These shortcomings hinder the overall learning experience and restrict the potential of online education to cater to diverse learners. Moreover, faculty members often lack the necessary resources, training, acceptance, and professional development opportunities to enhance their skills and teaching presence and adapt to evolving pedagogical demands even in the light of emerging generative artificial intelligence tools (Ahmad et al., 2023; Clarin & Baluyos, 2022).

COVID-19 pandemic and the digital transformation of higher education has exposed significant vulnerabilities in traditional pedagogical approaches (du Plessis et al., 2022). Institutions worldwide have been forced to confront the limitations of their existing educational models, gaps in digital literacy, and recognizing that the one-size-fits-all approach is fundamentally incompatible with the diverse and dynamic learning needs of contemporary students (Wang et al., 2021). The pandemic served as a critical inflection point, revealing the urgent need for more flexible, inclusive, and technologically adaptive educational strategies (du Plessis et al., 2022).

Technological disruption has not only challenged existing pedagogical frameworks but has also created unprecedented opportunities for educational innovation. Generative artificial intelligence tools, while complex and potentially overwhelming, offer potential solutions to longstanding challenges in personalized learning and inclusive education (Karanja, 2024; Rahiman & Kodikal, 2024; Wang'ang'a, 2024). However, the effective integration of these technologies requires a sophisticated understanding of the tools themselves and their impact on pedagogical design, learner diversity, technological capability, and institutional support (Cabero-Almenara et al., 2024; Simatupang et al., 2025).

The increasing diversity of student populations further underscores the necessity for adaptive and inclusive learning environments (Eden et al., 2024; Shaw, 2009). Students now represent a wide spectrum of backgrounds, technological proficiencies, specific educational needs, and personal circumstances (Eden et al., 2024; Rizos et

al., 2024). Traditional educational models often fail to accommodate this complexity, leading to marginalization and reduced educational opportunities for many learners (Gupta & Khan, 2023; Silva, 2024).

One promising approach to addressing these challenges is the adoption of Universal Design for Learning (UDL). The UDL framework provides multiple means of engagement, representation, and expression, ensuring the success of all students in online learning environments, regardless of their backgrounds or abilities (Garrad & Nolan, 2022). By embracing principles of flexibility, accessibility, and learner empowerment, UDL offers a comprehensive strategy for reimagining educational design in the digital age (Llorent-Vaquero & Villaciervos-Moreno, 2021; Vasinda & Pilgrim, 2023).

In this study, faculty are conceptualised as adult learners engaged in workplace-based professional learning. The UDL workshop series functioned as an adult education intervention grounded in principles of andragogy, experiential learning, and reflective practice. Consistent with adult learning traditions, participants drew on prior teaching experience, engaged in collaborative problem-solving, and applied innovative ideas directly to their instructional contexts. The study therefore examines UDL and CoI not only as instructional design frameworks, but as mechanisms that support adult educators' professional growth, identity development, and transformative shifts in teaching practice.

The Community of Inquiry (CoI) framework further complements UDL by emphasizing the critical importance of social, cognitive, and teaching presences in creating meaningful learning experiences (Garrison, 2024). This theoretical lens provides a nuanced understanding of how interactive, collaborative, and supportive learning environments can be constructed in digital spaces (Alvi, 2022).

The current case study aims to explore how the implementation of UDL principles within a Community of Inquiry (CoI) framework can enhance online course design, delivery, and assessment in higher education. By bridging theoretical frameworks with practical implementation strategies, the research seeks to provide actionable insights for educational transformation.

This study was guided by the following research questions:

1. How do faculty perceive changes in their teaching presence and instructional effectiveness after implementing UDL principles within a CoI framework?

2. In what ways does faculty participation in UDL-focused professional development influence their course design decisions and assessment strategies?
3. Which specific UDL implementation strategies do faculty identify as most effective for enhancing student engagement and supporting diverse learning needs in asynchronous online environments?

Analytic Proposition. Based on prior research on faculty professional learning, we anticipated that integrating UDL principles within a Community of Inquiry framework would support incremental changes in course design, teaching presence, and instructional engagement.

By investigating these aspects, this research sought to identify effective strategies for enhancing faculty teaching presence, active learning, and student engagement. The study aims to contribute to the broader discourse on innovation in online education and provide actionable insights for institutions striving to enhance their digital learning environments. Moreover, it represents a critical step towards understanding how pedagogical frameworks can be systematically adapted to meet the complex and evolving needs of 21st-century learners.

A review of literature examined four interconnected areas that form the foundation of our research: (1) Universal Design for Learning principles and implementation, (2) faculty professional development models, (3) iterative design thinking and rapid experimentation, and (4) the Community of Inquiry framework, with particular attention to how data-driven approaches and international collaboration enhance these areas.

Universal Design for Learning (UDL). UDL is a research-based framework aimed at optimizing student learning by providing multiple means of engagement, representation, and expression. The UDL model recommends presenting course content in various ways, offering students different options for engagement, and facilitating choice in expressing knowledge and skills (Xie & Rice, 2021). Xie and Rice (2021) found that instructors invested in the practice by their beliefs that UDL could improve student engagement. This aligns with the idea that the UDL principles are designed to accommodate all learners, regardless of their abilities, backgrounds, or learning preferences (Slattery, 2021).

Garrad and Nolan (2022) emphasize the importance of embedding UDL in online studies to enhance student success and engagement. They argue that UDL principles can be effectively integrated into higher education unit design to create more inclusive and accessible learning environments. Their theoretical approach is

grounded in the principles of UDL, which advocate for multiple means of representation, engagement, and expression to cater to diverse learner needs.

The UDL framework itself is rooted in cognitive and educational theories, drawing from research in neuroscience, learning sciences, and cognitive psychology. It incorporates concepts such as the Zone of Proximal Development, scaffolding, and multiple intelligences (CAST, 2024). These theoretical foundations support the idea that learning environments should be intentionally designed, flexible, and adaptable to meet the needs of all students.

Several empirical studies have demonstrated the effectiveness of UDL in various educational settings. For instance, a systematic review by Seok et al. (2018) analyzed seventeen empirically based studies on UDL implementation at the postsecondary level. The review found that UDL principles were effective in improving learning outcomes for students with and without disabilities. The included studies used a range of methodologies, such as course evaluations Iniesto et al., 2023), learning outcome assessments (Zhang et al., 2021; Davies et al., 2013), and surveys (Wells, 2022; Schelly et al., 2011) to measure the impact of UDL on student engagement and performance. Olivier and Potvin (2021) also contributed to this body of research by examining faculty development programs aimed at implementing UDL, using formative assessments to evaluate their effectiveness in reaching every college student.

Additionally, a study by Veytia Bucheli et al. (2024) examined the perceptions of higher education students regarding the use of digital technologies to support UDL implementation. Using a quantitative methodology with a descriptive scope, the study collected data through a Likert-scale questionnaire and found that students had favourable perceptions of technology use in UDL across all three principles: representation, action and expression, and engagement. This empirical evidence further supports the integration of digital tools to enhance UDL practices in higher education.

Faculty Professional Development. For UDL to be implemented successfully, faculty must first understand the process and be willing to integrate it into their teaching. Effective professional development is crucial for faculty engagement and student success in online environments. Online programs hold strategic importance for institutions, necessitating faculty who are engaged and effective in online teaching (Allen & Seaman, 2016). Continuous improvement and data-driven decision-making are essential components of successful professional development

programs (Datnow & Hubbard, 2016). They encourage a culture that supports data-driven decision-making monitored by faculty and built on a continuous improvement foundation. Universities need faculty members who are engaged and effectively teaching in the online environment to facilitate this improvement.

Brown et al. (2024) advocate for a responsive model of professional development that engages faculty based on their approach to learning and their concerns about professional development and course quality. Their research examined quality constructs that centred on engagement at the course level, helping faculty harness their potential through the lens of student engagement. This model emphasizes faculty agency and intrinsic motivation, focusing on how individual faculty members' learning preferences and concerns shape their engagement with professional development initiatives.

In contrast, Kushwaha and Singh (2023) propose a professional development model that uses technology and UDL to build teacher capacity for inclusive education. Their model highlights the need for ongoing support and training to help faculty implement UDL principles effectively. This approach is more structured and systematic, emphasizing the role of technological tools and explicit UDL frameworks in guiding faculty development.

Comparing these models reveals complementary strengths that inform our research approach. Brown et al.'s responsive model provides insights into faculty motivation and engagement factors, which are crucial for initial buy-in and sustained participation. Kushwaha and Singh's model offers concrete implementation strategies and technological integration techniques that provide practical guidance for UDL adoption. The integration of these approaches, combining responsiveness to faculty concerns with structured UDL implementation frameworks, offers a promising direction for comprehensive faculty development that addresses both motivational and practical aspects of UDL integration in online teaching.

Supporting these integrated approaches, Williams (2024) shared a framework for providing mandatory professional development for online facilitators, emphasizing practical skills, ongoing training, competency assessment, and performance evaluation. These outline stepwise implementation that trainers can follow as they engage with faculty, bridging the individual responsiveness of the approach by Brown et al., with the structured approach of Kushwaha and Singh.

Iterative Design Thinking and Rapid Experimentation. Iterative design thinking involves a cyclical process of prototyping, testing, and refining educational practices.

This approach aligns with the principles of continuous improvement, fostering an environment where faculty can experiment with new teaching strategies and receive feedback to enhance their practice (Howard et al., 2021). They found that a continuous improvement mindset provides the openness needed to examine results and outcomes for students. Rapid experimentation allows for the quick implementation and assessment of current ideas, facilitating timely adjustments based on feedback and data (Bjælde & Lindberg, 2018). Mackey et al. (2023) discuss experience-based UDL applications and how overcoming barriers to learning through iterative design can lead to more effective teaching practices. Their study underscores the importance of continuous experimentation and feedback in refining UDL strategies.

Community of Inquiry Framework and Data-Driven Approaches. The Community of Inquiry (CoI) framework is widely used to guide the design and structure of collaborative-constructivist learning in online courses. It emphasizes the development of cognitive, social, and teaching presence, which are critical for effective online learning (Sadaf et al., 2022). UDL-informed design can support the development of these presences, enhancing the overall learning experience (Seymour, 2024).

Data-driven approaches to faculty development involve the use of feedback loops and continuous assessment to inform teaching practices. Learning management systems can provide valuable data on student engagement and performance, helping educators identify areas for improvement and tailor their teaching strategies accordingly (Bjælde & Lindberg, 2018). In the same vein, Shea (2023) believes that faculty can use data to evaluate their teaching effectiveness and adjust their strategies and content to better meet students' needs. Bjælde and Lindberg (2018) and Shea (2023) suggest that certain conditions can enhance learner engagement and success when effective practices are implemented. Kirkpatrick's Four-Level Training Evaluation Model (1998) was used as an organising and interpretive heuristic rather than as a formal programme-evaluation framework. The model provided a structured way to examine participants' reflections across reaction, learning, changes in teaching practice, and perceived institutional relevance, while acknowledging that evidence at the institutional 'results' level remains preliminary and exploratory. Kirkpatrick's model provides a comprehensive framework for evaluating the effectiveness of professional development programs that might lead to these effective conditions and practices. This model evaluates reactions, learning, behaviour change, and results, making it particularly valuable for assessing the impact of UDL

workshops and other training initiatives on faculty performance and student outcomes. By applying this evaluation framework, institutions can gather evidence of the effectiveness of their professional development efforts and make data-informed decisions about future training needs.

International Collaboration for Enhanced UDL Implementation. International collaboration plays a significant role in enhancing faculty development and inclusive education practices through the exchange of diverse perspectives and approaches to UDL implementation. Waters and Wang (2023) discuss the importance of capacity development and international collaboration in sub-Saharan academia, highlighting the benefits of cross-border partnerships in improving educational outcomes. These collaborations provide opportunities for faculty to learn from diverse cultural contexts and educational systems, enriching their understanding and application of UDL principles.

Yunus et al. (2024) explore academic capacity-building through international collaboration, focusing on empowerment programs with universities in Malaysia. Their study demonstrates how collaborative efforts can support faculty in adopting inclusive design practices and improving their teaching effectiveness. International partnerships can facilitate the sharing of resources, expertise, and innovative approaches to UDL implementation, enhancing the quality of online education for diverse student populations.

Synthesis and Implications for the Current Study. The integration of iterative design thinking, rapid experimentation, and UDL principles within a robust faculty development framework can significantly enhance universal design practices in higher education. The comparative analysis of faculty development models highlights the importance of balancing responsiveness to individual faculty needs (Brown et al., 2024) with structured frameworks for UDL implementation (Kushwaha & Singh, 2023). This integrated approach aligns with iterative design thinking methodologies, where both individual creativity and systematic refinement contribute to successful outcomes. By fostering a culture of continuous improvement and data-driven decision-making through international collaboration, institutions can support faculty in developing effective and inclusive online courses. This literature review underscores the importance of professional development programs that encourage experimentation, collaboration, and the use of evidence-based strategies to improve teaching and learning outcomes while remaining attentive to faculty concerns and learning preferences.

Methodology

The study adopted a qualitative case study design grounded in an interpretivist epistemology, with the aim of understanding how faculty experienced and applied UDL principles within their online teaching practice. While an initial exploratory post-workshop survey generated a small set of descriptive indicators, the primary source of analytical data comprised focus-group discussions and reflective faculty feedback. The descriptive statistics from the survey were therefore used only to contextualise participants' reactions to the workshop and not as a separate or independent quantitative strand of analysis.

The research sample consisted of fifty-two higher education teachers from Africa Nazarene University in Nairobi, Kenya. Through purposive sampling, a technique fundamental to qualitative research, the study carefully selected individuals most likely to provide rich, relevant, and diverse data. The participant group represented a diverse academic landscape, including eight faculty members from the Humanities, twelve from the Sciences, and thirty-two from the Social Sciences. The cohort comprised thirty-five male and seventeen female educators. Collectively, the group represented more than fifteen years of combined experience in online and hybrid teaching across their disciplinary contexts. The researchers were drawn from Kenya and United States of America for a collaborative effort.

The research employed a focus group methodology within the Community of Inquiry (CoI) framework to explore content preparation and UDL implementation practices. Building upon the original survey instrument, the focus group approach replaced the initial survey's modest response rate with a more in-depth, collaborative exploration of participants' experiences. The original survey instrument was used in the early phase of the project; however, limited narrative depth in the written responses prompted a methodological shift toward focus-group conversations, which allowed for richer, dialogic exploration of participants' experiences of UDL implementation.

The analytical approach integrated multiple qualitative research techniques to extract meaningful insights. Unlike traditional quantitative methods, the analysis focused on descriptive exploration, frequency patterns, and thematic interpretation. The research team conducted a systematic examination of the data, emphasizing theme identification and categorical organization. The specific analytical methods used for the study included:

a) Descriptive statistical analysis;

b) Frequency and percentage analyses; and

c) Comprehensive thematic analysis.

This approach allowed for a nuanced understanding of participants' experiences, moving beyond numerical representations to capture the rich, contextual narratives of UDL implementation.

The study's conceptual framework drew from Kirkpatrick's Four-Level Training Evaluation Model, providing a structured approach to assessing workshop effectiveness. This model enabled a comprehensive examination of participant reactions, learning outcomes, behavioural changes in teaching practice, and potential broader institutional impacts. By expanding the original framework, the research captured both immediate workshop experiences from Summer 2023 and longitudinal implementation efforts through Summer 2024.

Ethical considerations remained paramount throughout the research process. The study prioritized voluntary participant engagement, comprehensive informed consent, assured confidentiality, and participants' right to withdraw at any time. This ethical approach ensured a transparent and respectful research environment that valued the participants' experiences and contributions.

The methodology transformed the original quantitative survey into a dynamic, interpretive research design. By prioritizing depth of understanding over breadth of response, the study created a more intimate and comprehensive examination of Universal Design for Learning implementation practices in higher education. This approach allowed for a rich, contextual exploration of how educators understand, internalize, and apply innovative teaching strategies within their unique institutional and disciplinary contexts.

Results

The intent of the study was a collaborative effort to improve online learning through professional development. The workshop facilitated this process by first highlighting the application of the principles of UDL to address gaps in course design, delivery, assessment, and barriers to effective student learning (Mackey et al., 2023). Thereafter, the process of implementation was monitored, and feedback was collected to gain insight into the effectiveness of capacity building (Kushwaha & Singh, 2023).

Post-workshop interventions included individualized training on course design, particularly onboarding and content sections. Faculty were trained on tips for engaging in live virtual classes, such as unmuting videos and using nonverbal

gestures to enhance interaction. Breakout sessions during live classes to enhance peer-to-peer interactions were encouraged. Other interventions included promoting student-led topics, where students are engaged in designing and delivering content.

Participants' Reaction to Professional Development Engagement. Five items captured the participants' immediate reactions to the workshop's training. The survey required respondents to express their satisfaction levels with the workshop facilitation style, including how the facilitators were able to engage the participants. The items on a 5-point Likert scale sought to understand the relevancy of materials shared from the participants' viewpoint. In general, the faculty provided insights into how they perceived the workshop. The five items had a raw alpha of 0.95, showing a high internal consistency of these items. The average mean and standard deviation were 4 and 0.85, respectively (see Table 1). This average mean was a high score, indicating a high level of satisfaction.

Table 1: Satisfaction Levels of the Workshop's Facilitation

Question	Mean	SD
Q1. How satisfied were you with the facilitation style?	3.9	0.94
Q2. How effective were the facilitators in involving the participants in the discussions?	4.0	0.77
Q3. Were materials provided relevant to your context?	4.1	0.83
Q4. How satisfied were you with the virtual workshop overall?	4.0	0.77
Q5. Would you recommend this workshop to your peers?	4.1	0.94
Average	4.0	0.85

Note. Participants ratings on a 5-point Likert scale. Higher scores indicate greater satisfaction or agreement.

The responses presented in Table 1 suggested that the workshop and subsequent training sessions were well-received. This can be inferred from the strategies that the faculty implemented. The faculty who responded were able to articulate how the workshop addressed their instructional needs and challenges based on the feedback captured by the workshop takeaways in Table 2.

Table 2: Workshop's Takeaways

Workshop's Takeaways	Responses
Class Engagement and Participation	6
Timely Feedback	1
Understanding Online Distance Learner Experiences	2
Social and Emotional Dynamics in Online Classes	1
Role of the Facilitator	2
Content Creation and Delivery	4
Improving Course Design and Learning Outcomes	3

Note. Frequencies reflect the number of participants who identified each theme as a key takeaway from the workshop.

The faculty reflected on challenges encountered, including time constraints and technological connectivity issues. Other challenges mentioned included poor time management and academic integrity with the entry of generative AI. Faculty feedback is presented in Table 3.

Table 3: Challenges Encountered

Challenges	Responses
Technological Connectivity	4
Time Management	2
Poor Student Engagement	4
Academic Integrity	1

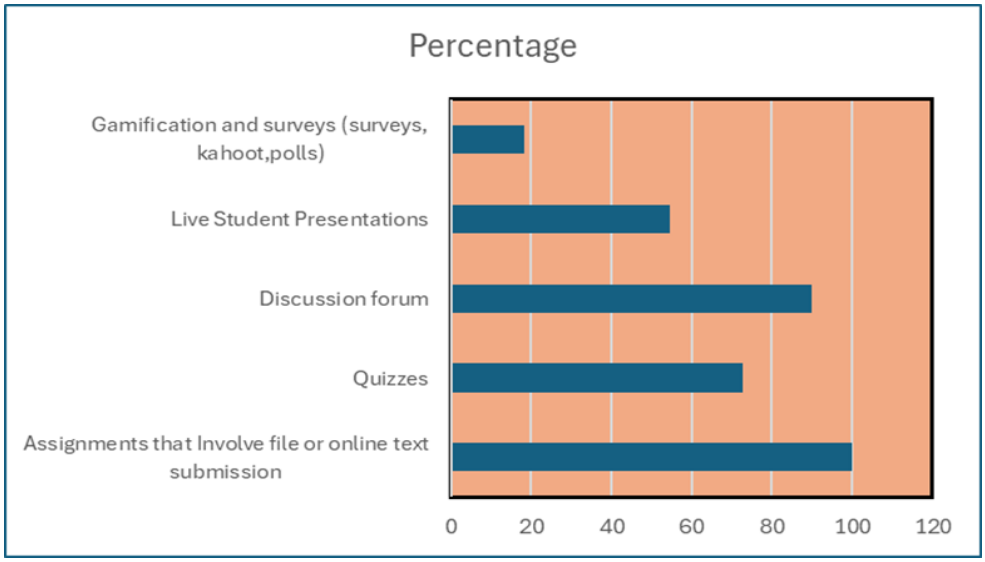
Note. Frequencies reflect the number of participants who identified each challenge encountered.

Learning Outcomes

Kirkpatrick's second level evaluates the extent to which participants acquired the intended knowledge, skills, and attitudes. These are the workshop's learning outcomes. The study noted that the faculty outlined some key learning outcomes, including the adoption of the Community of Inquiry framework in designing online engagements. The principle of constructive alignment and techniques for enhancing teaching presence were other learning outcomes that the faculty adopted. They also demonstrated an understanding of how to create more engaging and inclusive online learning environments, as evidenced by their reflections on improving social presence, using prompt and proactive feedback, and designing authentic assignments

(see Figure 1). These responses illustrate the specific strategies faculty reported implementing following the workshop.

Figure 1: Approaches for Engaging Learners with the Learning Process



Note. The figure represents the percentage of participants who reported using selected approaches in their online teaching.

Behavioural Changes in Teaching Practice. At this level, we assessed whether faculty applied what they learned in their work environments. The study noted evidence of behavioural changes among faculty members, particularly in how they design and deliver online courses. For instance, faculty members reported improvements in course design, such as the use of onboarding sections, standardized course templates, and enhanced student engagement strategies. These strategies included live sessions, gamification, surveys, and discussion forums (see Figure 1). Faculty demonstrated their understanding of the experiences of online learners. Teacher reflections are presented in the following vignettes, "students feel isolated and lack group encouragement" and "online learners struggle to access the content just as the facilitator does in supplying the content when there is poor connectivity."

Additionally, the emphasis on regular communication, timely feedback, and student-led topics suggests that faculty members are implementing the strategies they learned to create more interactive and student-centred learning experiences as indicated in their earlier responses. The institutional-wide adoption of a standard course design template further indicates that the training has led to tangible changes in teaching practices.

The faculty were able to identify areas that they need to improve as a follow-up to what they learned in the workshop. Improvements in course design and delivery, teaching strategies, assessment, and feedback were the key areas (see Table 4).

Table 4: Areas of Improvement

Category	Responses
Course Design and Preparation	4
Improved Teaching Strategies	5
Content Delivery	3
Assessment and Feedback	2

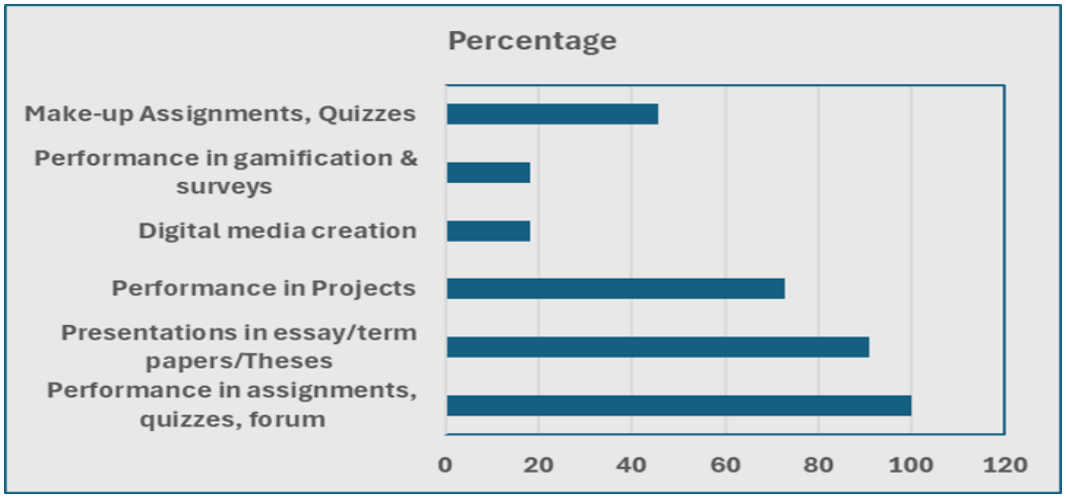
Note. Frequencies represent the number of faculty who identified each category as a key takeaway from the workshop.

Results and Broader Institutional Impact

At this level, the analysis focuses on participants' perceptions of the broader relevance of the professional development initiative for online learning at the institution. The findings do not measure institutional outcomes directly. Rather, they reflect faculty reports of emerging shifts in course-level practice and collaborative capacity-building that they associated with the workshop experience.

Faculty described interventions to enhance student engagement and improve course design. They believed these interventions would facilitate better learning outcomes and higher satisfaction among students. The interventions included authentic assessments such as projects and live presentations to demonstrate content mastery. Faculty also implemented make-up assignments to help students improve their performance. Additionally, they identified the use of gamification, surveys, and project-based activities to gauge students' understanding (Figure 2). These developments suggest potential for longer-term institutional benefits; however, such impacts were beyond the evidentiary scope of the present study and remain an area for future investigation.

Figure 2: Methods for Demonstrating Understanding and Content Mastery



Note. Percentage of participants reporting student performance levels across various assessment and engagement modalities in online class.

Furthermore, the collaboration between ANU and UCF highlights the transfer of best practices from the global north to the global south. This collaboration could have long-term benefits for the quality of online education at ANU. Building teacher capacity is critical to enhancing students' access to quality education (Kushwaha & Singh, 2023).

Discussion

Whereas the results section describes the specific strategies and course design changes reported by faculty following the workshop, this discussion interprets these findings in relation to adult learning theory, the Universal Design for Learning (UDL) framework, and elements of the Community of Inquiry (CoI) model.

The findings suggest that faculty learning processes operated not only at the level of technical adoption of new course design and facilitation features, but also at the level of reflective professional growth and teaching presence. Many participants described iteratively experimenting with new course structures, interaction strategies, and assessment approaches, observing how students responded, and then refining their practices over time. These cycles are characteristic of experiential and practice-embedded adult learning, in which meaning-making is shaped by the integration of prior professional experience, peer dialogue, and application to authentic problems of practice (Dillard et al., 2024; Kolb & Kolb, 2022). In this sense, the workshop functioned as a reflective learning space rather than a one-off technical training activity.

When considered through the CoI framework, several of the reported course-level adjustments align with developments in teaching presence, particularly in relation to clearer course organisation, structured onboarding, and intentional facilitation of interaction. The introduction of regular feedback cycles, opportunities for student-led contributions, and use of collaborative activities also supported aspects of social presence by enabling learners to engage more actively with both peers and instructor (Morrison & Jacobsen, 2023). These shifts, in turn, provided conditions that may have contributed to greater opportunities for cognitive presence as students participated in meaning-making around course concepts enhancing learners' presence (Armah et al., 2023; Chi, 2023; Shehzad & Charles, 2023).

The strategies that faculty reported implementing, including varied modes of engagement, opportunities for collaborative participation, and multiple pathways for demonstrating learning, are also consistent with UDL principles related to flexibility, engagement, and representation. Rather than being applied as isolated techniques, these practices were described as evolving through iterative cycles of experimentation and reflection, suggesting that UDL implementation was embedded within broader processes of professional identity development and pedagogical decision-making.

The reasons faculty reported sustaining these changes appear to be intricately linked to features of the professional development environment that align with adult learning traditions. Participants emphasised the relevance of workshop activities to their immediate teaching needs, the opportunity to implement and assess ideas directly in their own courses, and the value of collegial interaction during and after the sessions. These conditions supported self-directed, problem-centred learning and may help explain why participants described longer-term adjustments to course design and facilitation practices rather than short-term or compliance-based modifications (Bhat & Dahal, 2023).

Taken together, the findings indicate that UDL-oriented professional development can operate as a form of workplace-based adult learning that strengthens teaching presence and supports incremental, context-sensitive change in online course design (Rao, 2021). Although participants perceived these developments as beneficial for student engagement, further research incorporating student perspectives and direct learning evidence is needed to examine the extent and nature of these outcomes.

Limitations of the Study

Specific quantitative results such as student performance data as results of these interventions are not provided in this study. They could have provided more valuable evidence of the workshop interventions' effectiveness in improving faculty quality. The study limited its focus to continuous improvement and data-driven insights. However, it does not provide specific entry behaviour of faculty before the workshop. The training has the potential to yield positive institutional results over time. There is a need for further investigation on the effectiveness and impact of post-workshop interventions, especially to capture students' performance and input.

Conclusion

The workshop initiative demonstrated strong alignment with Kirkpatrick's (1998) Model of Training Evaluation, as evidenced by positive faculty reactions, the acquisition of new skills, and their application in course design and delivery. The potential for improved student outcomes further indicates the effectiveness of the training. This underscores the critical role of professional development in equipping educators with the necessary skills and attitudes to address the unique needs of learners (Kushwaha & Singh, 2023). To fully assess the impact, it would be beneficial to collect and analyse additional data, particularly at the Results level, to measure the long-term effects on student learning and institutional performance.

Key Takeaways and Implications

The findings from this study demonstrate that collaborative peer feedback cycles significantly enhanced faculty confidence in implementing UDL principles, highlighting the value of peer support in professional development. The structured approach combining iterative design thinking with rapid experimentation effectively improved faculty teaching practices and skills. By applying UDL principles within a Community of Inquiry framework, the faculty created more inclusive and engaging online learning environments benefiting all participants. Data-driven approaches and continuous feedback loops facilitated the ongoing refinement of teaching strategies, leading to sustained improvements in course design and delivery. Additionally, the collaboration between ANU and UCF exemplifies how international partnerships can effectively share best practices and build capacity for inclusive education.

Building on the findings from this study, HEIs in Africa can prioritize the integration of structured, peer-supported professional development models into their faculty development programs that is data-informed and driven. Such practices are low-cost

and enhance collaboration among departments. HEIs can adapt UDL principles within existing teaching and learning frameworks adapting them to local sociocultural contexts to ensure relevance and sustainability. Again, the success from ANU-UCF partnership underscores the values of South-North and South-South institutional collaborations. HEIs in Africa should actively seek and cultivate equitable international partnership that promotes knowledge exchange and joint capacity-building initiatives while focusing on African epistemologies and learners' needs.

Future Research

Building on these findings, future research should pursue longitudinal studies to assess the long-term impact of UDL-based professional development on teaching practices and student outcomes. Incorporating quantitative measures, particularly student performance data, would provide more robust evidence of UDL intervention effectiveness. Expanding research across diverse educational contexts and institutions would help determine the generalizability of these findings. Further investigation into how emerging technologies like generative AI tools can enhance UDL implementation and faculty development represents another promising direction. Finally, incorporating student perspectives would offer a more comprehensive understanding of how UDL practices impact learning experiences and outcomes.

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Appendix 1 - UDL Principles for Process Improvements

UDL Principles for Process Improvements. Available at:

https://docs.google.com/document/d/1DKBLx4dLT7PbNyjBExoQcIojmGy57uzqQUaNO701EMM/edit?usp=sharing