



Navigating Inclusion: Integration of Universal Design for Learning (UDL) in a Classroom

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ABSTRACT

The study explored how Universal Design for Learning (UDL) is integrated into classroom practices in Zambia. The findings present a qualitative analysis of 48 responses to interview question on Universal Design for Learning (UDL) in special education classrooms. The responses indicate a generally positive understanding of UDL as an inclusive, flexible and proactive approach to teaching. The study reported using visual, auditory, practical and collaborative strategies, learner choice, differentiated activities and flexible assessment formats. The strongest barriers were time and curriculum-coverage pressures, and inadequate resources, materials or technology. School support was most frequently associated with access to materials and resources, administrative encouragement and training/continuing professional development. Recommendations focused on more resources and assistive technology, teacher training, collaboration with stakeholders, improved staffing/class-size conditions and infrastructure, and greater curriculum/time flexibility. Therefore, the findings suggest that UDL is understood and partially practiced, but sustainable implementation requires stronger systemic support.

Keywords: Universal Design for Learning; special education; inclusive education; differentiated instruction; assessment; teacher professional development; assistive technology.

INTRODUCTION

Universal Design for Learning (UDL) is an educational framework aimed at improving and optimizing teaching and learning for all people based on scientific insights into how humans learn. Rooted in the belief that barriers to learning reside in the curriculum rather than the learner, UDL promotes flexible approaches that can be customized and adjusted for individual needs (CAST, 2020). The three core principles of UDL providing multiple means of engagement, representation, and action/expression serve as a blueprint for inclusive and equitable education (Meyer, Rose, & Gordon, 2021). The implementation of UDL principles is particularly relevant in special education classrooms, where diverse learning needs and disabilities challenge traditional teaching methods. According to Tobin and Behling (2021), UDL enables educators to anticipate barriers to learning and proactively design curriculum that benefits all students, including those with disabilities. Despite the conceptual alignment between UDL and the goals of special education, the practical integration of UDL in special education settings remains inconsistent and under-explored. While several studies affirm the potential of UDL to enhance learning experiences for students with disabilities (Smith & Lowrey, 2022; Al-Azawei, Serenelli, & Lundqvist, 2021), there is a paucity of empirical research examining how teachers in special education classrooms apply UDL principles in their daily practices. Furthermore, many educators report limited training and confidence in implementing UDL strategies effectively, particularly in resource-constrained contexts (O'Connor et al., 2023).



A significant gap exists in understanding the systemic and contextual challenges that hinder UDL implementation in special education, especially in low- and middle-income countries. Much of the literature is based on research conducted in high-income countries, which may not reflect the realities of educational systems in other settings. As noted by Chita-Tegmark et al. (2020), there remains a critical need to investigate how UDL is adapted and operationalized across diverse cultural and educational landscapes. In addition, there is limited research on the impact of school leadership, policy frameworks, and teacher beliefs on the effective implementation of UDL in special education classrooms. The interplay between these factors can significantly influence how UDL principles are translated from theory into practice (Schaefer, Rice, & Dwyer, 2021). Given these gaps, this study seeks to explore the implementation of UDL principles in special education classrooms, with a focus on the perceptions, practices, and challenges experienced by educators. Understanding these dimensions is vital for informing professional development, instructional design, and policy reform aimed at fostering inclusive education for all learners.

Statement of the Problem

While Universal Design for Learning (UDL) principles have gained recognition as a framework for accommodating diverse learner needs, there is a dearth of research specifically examining their implementation within special education classrooms. Despite the potential benefits of UDL in fostering inclusive learning environments, challenges such as limited teacher training, resource constraints, and systemic barriers may hinder effective implementation. Hence, it was critical to investigate the extent to which UDL principles are being applied in special education contexts, identify barriers to implementation, and explore strategies for enhancing uptake and fidelity. The study explored how Universal Design for Learning (UDL) principles are integrated into instructional practices within special education classrooms.

METHODS AND MATERIALS

Research Design

The study employed a qualitative multiple-case study design to explore how Universal Design for Learning (UDL) principles were understood and implemented in special education classrooms. The design enabled an in-depth examination of teachers' experiences, practices, and challenges within their natural school contexts.

Study Context

The study was conducted from 6 provinces with six major inclusive schools providing special education services in existence for more than two decades. The schools differed in learner characteristics, resources, staffing, classroom organisation, and institutional support, providing varied contexts for examining UDL implementation.

Participants

The study involved 48 participants, comprising seven special education teachers and one special education coordinator from each school. Participants had at least two years of experience working in inclusive or special education settings and were selected because of their direct knowledge and experience relevant to UDL implementation.

Sampling Procedure

Purposive sampling was used to select the three schools and the 48 participants. Schools were selected because of their involvement in inclusive and special education, while participants were selected based on their relevant professional experience and knowledge of inclusive classroom practices.

Data Collection Methods

Data were collected through semi-structured interviews, classroom observations, and document analysis.



Interviews lasted approximately 45–60 minutes and explored participants’ understanding and application of UDL. Observations examined classroom practices, learner engagement, teaching strategies, and assessment, while documents such as lesson plans, IEPs, and professional development materials provided supporting evidence. The semi-structured interview guide was based on the three UDL principles: engagement, representation, and action and expression. Questions addressed teachers’ understanding of UDL, instructional practices, assessment, learner participation, resources, professional development, school leadership, and implementation challenges. Probing questions were used to obtain detailed examples and clarification.

Data Collection Period and Procedure

Data were collected during a defined fieldwork period following ethical approval and permission from relevant authorities and schools. The researcher first recruited eligible participants, obtained informed consent, conducted interviews and observations, and subsequently reviewed relevant documents. Data collection continued until sufficient information had been obtained to address the research questions and identify recurring patterns.

Data Analysis

Interview recordings were transcribed, checked for accuracy, and organised together with observation notes and documents. Participants and schools were assigned codes to protect their identities. All research materials were securely stored and systematically organised for analysis. Data were analysed using Braun and Clarke’s (2021) six-phase thematic analysis framework: familiarisation, initial coding, searching for themes, reviewing themes, defining and naming themes, and reporting. Both deductive coding based on the UDL framework and inductive coding for emerging issues were used. Descriptive frequencies were calculated to show the prominence of themes within the 48-participant dataset. Percentages were used only descriptively and were not treated as statistical estimates. Because participants could discuss multiple themes, percentages could overlap and therefore did not necessarily total 100%.

Trustworthiness

Trustworthiness was strengthened through triangulation, member checking, systematic documentation, and comparison of interviews, observations, and documents. Credibility, dependability, and confirmability were supported through careful documentation of the research and analytical processes.

Ethical Considerations

Ethical approval and institutional permission were obtained before data collection. Participants provided informed consent and were informed that participation was voluntary and that they could withdraw without penalty. Confidentiality and anonymity were maintained through participant codes, secure data storage, and removal of identifying information from the findings.

Presentation of Findings

Major Theme	Sub-themes	Representative Participant Excerpts
From Awareness of Inclusion to Conceptual Understanding of UDL	§ Understanding UDL as inclusion;	Excerpt 1: “I have heard of Universal Design for Learning, but I thought it was just about making learning easier for learners with disabilities, like using big print or giving them extra time.”
	§ Accommodation;	Excerpt 2: “Is it the same as differentiated teaching?”
	§ Confusion between UDL and differentiation;	
	§ Limited conceptual knowledge	



The Paradox of Competent Practice Without Explicit UDL Knowledge	§ Experiential knowledge;	Excerpt 1: “We just observe what works with the learners.”
	§ Visual aids;	Excerpt 2: “For example, if a child is not writing, I allow them to respond orally.”
	§ Practical activities;	
	§ Flexible responses;	
	§ Implicit UDL practice	
Reactive Adaptation Versus Proactive Design	§ Reactive responses;	Excerpt 1: “We just observe what works with the learners.”
	§ Adaptation after barriers emerge;	Excerpt 2: “If a child is not writing, I allow them to respond orally.”
	§ Proactive planning	
Uneven Application of the Three UDL Principles	§ Representation;	Excerpt 1: “We do our best to accommodate, but we usually focus on how to present the content by using “visual aids, pictures, demonstrations, audio, video, real objects and sign language.”.”
	§ Engagement;	Excerpt 2: “Giving students different ways to express themselves is not something we do regularly.”
	§ Action and expression;	
	§ Learner choice;	
	§ Alternative expression	
Assessment as a Site of Both Progress and Tension	§ Flexible assessment;	Excerpt 1: “Fairness does not mean giving every learner exactly the same conditions. Some learners need extra time, accommodations or a different way of completing the task.”
	§ Oral responses;	Excerpt 2: I use “oral responses, practical demonstrations, presentations, flexible time, varied task formats, learner choice and accommodations.”
	§ Practical demonstrations;	
	§ Extra time;	
	§ Accommodations;	
	§ Equity and fairness	
Learner Benefits and the Question of Agency	§ Participation;	Excerpt 1: “learners independently selecting appropriate support tools.”
	§ Confidence;	Excerpt 2: UDL improve “participation, understanding, confidence and learner agency.”
	§ Understanding;	
	§ Learner choice;	
	§ Independence;	
The Structural Paradox: Teacher Willingness Within Constrained Systems	§ Time pressure;	Excerpt 1: “We don’t have enough materials to tailor instruction for everyone, and we are overwhelmed with large classes.”
	§ Large classes;	Excerpt 2: “There’s little room to adapt activities even when we know learners need something different.”
	§ Inadequate resources;	
	§ Technology;	
	§ Curriculum rigidity;	
	§ Assessment demands	
Professional	§ Limited training;	Excerpt 1: “I’ve heard about UDL during workshops, but



Development: Necessary but Not Sufficient		there's no in-depth training.”
	§ Superficial exposure;	Excerpt 2: “we need workshops and real examples to follow. We are willing, but we need guidance.”
	§ Practical workshops;	
	§ Sustained professional learning	
School Leadership as a Mediating Mechanism	§ Administrative encouragement;	Excerpt 1: “The administration plays a very important role. They help with materials and resources, administrative encouragement, training and CPD, and planning time or flexibility” as important forms of support.
	§ Resources;	Excerpt 2: “the school management supports UDL, teachers are encouraged to try different ways of teaching learners.”
	§ CPD;	
	§ Planning time;	
	§ Flexibility;	
	§ Institutional support	

The findings show that UDL implementation is emerging but uneven, reflecting an interaction between teachers' experiential capacity and the structural conditions in which they work. The findings therefore position UDL implementation as a mediated process involving teacher knowledge, proactive planning, classroom practice, learner agency, professional development, resources, curriculum flexibility, time, and school leadership.

INTERPRETATION AND DISCUSSION

The findings of this study reveal a complex and somewhat paradoxical pattern in the implementation of Universal Design for Learning (UDL) in special education classrooms in Zambia. On the surface, the evidence presents a relatively positive picture: teachers recognise the importance of inclusion, report confidence in supporting diverse learners, and describe numerous classroom practices that are compatible with UDL. However, closer interpretation reveals that this positive orientation coexists with limited conceptual understanding, uneven application of the three UDL principles, dependence on experiential adaptation, and substantial structural constraints (Smith & Lowrey, 2022). The significance of the findings therefore lies not simply in demonstrating that teachers use UDL-related practices, but in revealing a disjuncture between teachers' inclusive intentions, their conceptual understanding of UDL, their classroom enactment of UDL, and the institutional conditions within which that enactment occurs.

This discussion consequently argues that UDL implementation in schools should be understood as an emergent and mediated process of pedagogical change, rather than as a straight forward adoption of an instructional framework. The evidence indicates that teachers have developed considerable experiential capacity to respond to learner diversity, but this capacity has not yet been consistently transformed into proactive, theoretically informed UDL design. At the same time, the teachers' ability to make this transition is shaped by professional development, availability of resources, curriculum flexibility, time, school leadership and institutional collaboration. The findings therefore point towards an interaction between teacher agency and structural conditions, rather than locating implementation success or failure exclusively within individual teachers.

From Awareness of Inclusion to Conceptual Understanding of UDL: The first important finding concerns the distinction between teachers' understanding of inclusion and their understanding of UDL itself. The evidence demonstrates that 32 participants associated UDL primarily with inclusion and access for all learners. However, only four participants explicitly referred to multiple means of representation, engagement and action and expression. Proactive lesson design was identified in 19 responses, while flexibility or adaptation appeared in 15 responses. The empirical evidence therefore demonstrates a stronger recognition of the purpose of UDL than of its conceptual architecture. This distinction is central to interpreting the findings. Teachers appear to understand the normative proposition that all learners should have access to learning, but fewer



demonstrate explicit knowledge of the mechanisms through which UDL seeks to achieve that goal. The implication is that teachers' positive orientation towards inclusion cannot automatically be interpreted as evidence of UDL competence. This distinction is illustrated by the participant who stated: *"I have heard of Universal Design for Learning, but I thought it was just about making learning easier for learners with disabilities, like using big print or giving them extra time."*

The empirical evidence supports the interpretation that at least some teachers conceptualise UDL through the lens of accommodation. The further statement, *"Is it the same as differentiated teaching?"*, demonstrates uncertainty concerning the boundaries between UDL and other inclusive pedagogies. The tension here is important. The very inclusive beliefs that create favourable conditions for UDL adoption may simultaneously obscure the distinctive contribution of UDL if teachers interpret it simply as another term for inclusive education. Thus, positive attitudes towards UDL are necessary but not sufficient for implementation.

This finding is consistent with Katz and Sugden (2021), who highlight limitations in educators' preparation for UDL implementation. However, the present study extends this discussion by showing that the problem is not merely lack of exposure to UDL. Rather, there is a conceptual translation problem: teachers are interpreting UDL through established professional concepts such as differentiation, accommodation and inclusive education. The contribution of this finding is therefore to demonstrate that UDL professional development in this context must address conceptual differentiation, not simply awareness.

The Paradox of Competent Practice Without Explicit UDL Knowledge: A second finding creates an important contradiction. Teachers reported relatively extensive use of UDL-compatible practices despite their limited ability to articulate the formal principles of UDL. Participants described using visual aids, pictures, demonstrations, written materials, audio, video, real objects, sign language and technology. They also described group work, pair work, learner choice and practical activities. At first glance, limited conceptual understanding and substantial UDL-compatible practice appear contradictory. However, rather than treating the contradiction as an inconsistency in the data, it provides an important insight into how pedagogical knowledge develops. Teachers can acquire procedural or experiential knowledge through classroom experience without possessing the formal conceptual vocabulary necessary to explain that practice. This is illustrated by the teacher who explained: *"We just observe what works with the learners. For example, if a child is not writing, I allow them to respond orally. I did not know it is part of UDL."*

The empirical evidence establishes that the teacher uses a strategy consistent with flexible expression but did not previously conceptualise it as UDL. The interpretation is that UDL-related practice may be ahead of UDL-related conceptualisation among some teachers. This has an important implication for teacher development. A deficit interpretation would suggest that teachers first need to acquire UDL knowledge and then begin implementing UDL. The findings suggest a different pathway: teachers already possess relevant experiential knowledge, and professional development could make this tacit knowledge explicit, connect it to UDL theory and extend it systematically. Dell'Anna et al. (2022) similarly emphasise the importance of deliberate planning and anticipating learner variability. The present findings extend this position by suggesting that the transition from informal adaptation to UDL implementation may be facilitated by explicitly connecting teachers' existing classroom practices to the underlying theoretical principles. Thus, the study contributes a more nuanced interpretation of teacher capacity: the issue is not simply absence of knowledge but a disconnection between experiential knowledge and formal UDL knowledge.

Reactive Adaptation Versus Proactive Design: The distinction between reactive adaptation and proactive

design represents one of the most important conceptual tensions emerging from the findings. Teachers reported adjusting instruction when learners experienced difficulties. For example, allowing a learner to respond orally when writing is difficult demonstrates responsiveness to learner variability. However, the statement that the teacher *"did not know it is part of UDL"* suggests that the adjustment was made after a barrier emerged rather than anticipated during lesson design. The evidence therefore supports an interpretation of implementation as predominantly adaptive rather than consistently anticipatory. This distinction is theoretically significant. Reactive adaptation asks, *"What should I change now that this learner is experiencing a barrier?"* Proactive



UDL asks, "How can I design this lesson from the beginning so that predictable learner variability does not unnecessarily become a barrier?" The two approaches overlap but are not identical.

The study therefore identifies a potential transitional stage in UDL implementation. Teachers are already responding to diversity, but they require support to move from individualised reaction to systematic anticipation. This is consistent with Dell'Anna et al. (2022), but the present study adds contextual evidence from special education classrooms in special education schools showing how the distinction is manifested in everyday teacher decision-making.

Uneven Application of the Three Principles: The evidence also indicates that UDL implementation is not evenly distributed across engagement, representation and action and expression. Teachers described numerous strategies for representing information, including visual aids, pictures, demonstrations, audio, video, real objects and sign language. However, teachers acknowledged less systematic use of alternative forms of expression. One participant stated: *"We do our best to accommodate, but we usually focus on how to present the content. Giving students different ways to express themselves is not something we do regularly."*

This evidence suggests that implementation may be representation-heavy. The finding is consistent with Smith and Lowrey (2022), who observed greater emphasis on representation than on engagement and action and expression. The significance of this finding is that simply counting the presence of UDL-compatible strategies could produce an overly positive assessment of implementation. A teacher may use pictures, videos and demonstrations extensively while providing relatively few opportunities for learner choice, self-regulation or alternative expression. Teachers demonstrated substantial use of practices consistent with the three UDL principles, particularly multiple means of representation and flexible responses to learner needs. However, fewer teachers explicitly conceptualised these practices through the UDL framework, and proactive design was less evident than reactive adaptation. The findings therefore support a distinction between doing practices that are compatible with UDL and deliberately designing learning according to UDL principles. The former was relatively common; the latter was less consistently evident. This distinction explains the apparent paradox in the findings: teachers can demonstrate considerable pedagogical competence while simultaneously showing limited formal knowledge of UDL. Therefore, the presence of UDL practices should not be equated with balanced implementation of UDL. The study consequently contributes to the implementation literature by suggesting that evaluation of UDL should examine not only whether teachers use inclusive strategies but also which dimensions of UDL they privilege and which remain underdeveloped.

Assessment as a Site of Both Progress and Tension: Assessment findings provide further evidence of an emerging shift towards equity. Teachers reported oral responses, practical demonstrations, presentations, flexible time, varied task formats, learner choice and accommodations. The findings align with Chisala (2025), argued that one effective approach is to integrate Universal Design for Learning (UDL) principles into assessment creation. One teacher explained: *"Fairness does not mean giving every learner exactly the same conditions; some learners need extra time, accommodations or a different way of completing the task."* The empirical evidence demonstrates that teachers are questioning the assumption that fairness requires identical assessment conditions. The inference is that teachers are developing a more equity-oriented understanding of assessment.

However, this finding also creates an important tension between accessibility and assessment validity. Providing alternative ways of demonstrating knowledge can remove barriers, but the appropriateness of an alternative format depends upon the intended learning outcome. The evidence available in this study demonstrates teachers' use of flexible assessment, but it does not establish how consistently teachers distinguish between removing an irrelevant barrier and altering the competency being assessed. Instead, the findings point to a need for professional and policy guidance on how UDL, reasonable accommodation, curriculum expectations and assessment validity should interact. Thus, the study contributes to the discussion of inclusive assessment by identifying assessment as an important but potentially under-theorised site of UDL implementation.

Learner Benefits and the Question of Agency: Participants associated UDL with improved participation,

understanding, confidence and learner agency. One teacher described a learner stating, *“For the first time, I don't feel left behind because I can choose how to get the information.”* Another described learners independently selecting appropriate support tools. The evidence therefore suggests that teachers perceive UDL as potentially transforming the learner from a passive recipient of accommodation into an active participant in determining how learning occurs.

However, a methodological distinction is necessary. These accounts are teachers' reported perceptions of learner experiences, rather than independent measures of learner outcomes. The evidence therefore supports the claim that participants perceived benefits for learner participation and agency; it does not, by itself, establish causal effects of UDL on achievement or long-term learner outcomes. The findings provide a basis for arguing that UDL may support learner agency, but further research involving learners directly would be necessary to establish the extent and durability of these effects.

The Structural Paradox: Teacher Willingness Within Constrained Systems: From the findings the strongest tension is between teachers' willingness to implement UDL and the structural conditions within which they work. Time pressure and curriculum coverage were reported, inadequate resources, materials and technology, and rigid curriculum or assessment requirement (Schaefer et al., 2021). These findings are significant because they challenge an individualistic explanation of implementation. Teachers may be willing to implement UDL while simultaneously lacking the conditions necessary to do so consistently. One participant stated: *“We don't have enough materials to tailor instruction for everyone, and we are overwhelmed with large classes. It's not realistic to apply UDL fully under such conditions.”*

Another observed: *“The curriculum we follow is too rigid. There's little room to adapt activities even when we know learners need something different.”* The evidence therefore points to a teacher agency structural constraint paradox. Teachers are expected to exercise professional creativity, but the institutional environment may restrict the time, resources and flexibility required for that creativity. This supports Chita-Tegmark et al. (2020), who emphasise the wider educational environment in UDL implementation. However, the present study contributes a more contextually grounded explanation by showing that structural barriers interact directly with teachers' pedagogical choices. The findings consequently suggest that UDL implementation should be understood as an ecological process, rather than an individual teacher competency.

Professional Development: Necessary but Not Sufficient: The findings establish a clear need for professional development. One coordinator stated: *“I've heard about UDL during workshops, but there's no in-depth training. It's usually just mentioned in passing.”* Participants also requested practical workshops and real examples. One stated: *“If UDL can help us reach more learners, then we need workshops and real examples to follow. We are willing, but we need guidance.”* The evidence demonstrates a perceived professional learning gap. However, it would be analytically insufficient to conclude that additional training alone will solve the implementation problem. The barrier data show that resources, time, curriculum rigidity and technology are also significant constraints.

Thus, the relationship between training and implementation is conditional rather than linear. Training may increase teachers' knowledge and confidence, but its practical effect depends on whether teachers have the conditions necessary to enact what they have learned. This finding supports O'Connor et al. (2023) regarding the importance of teacher preparation while extending the argument by demonstrating that professional development must be embedded within a wider implementation infrastructure. The study therefore rejects a simplistic "train-and-transfer" model in favour of a sustained professional learning model involving lesson planning, practice, observation, collaboration, feedback and reflection.

School Leadership as a Mediating Mechanism: School administration emerged as another important mechanism connecting teacher capacity with structural conditions. Materials and resources were identified, administrative encouragement, training and CPD, and planning time or flexibility. The statement that *“The administration plays a very important role because when the school management supports UDL, teachers are encouraged to try different ways of teaching learners”* demonstrates that leadership is perceived as influencing

teacher practice. The evidence suggests that school leadership functions as a mediating mechanism: it can translate broader policy aspirations into school-level conditions through resource allocation, professional learning, collaborative planning and instructional supervision. However, the findings also show the limits of school-level agency. Participants noted that management support may exist while resources remain insufficient. Leadership is therefore necessary but not sufficient. This finding aligns with Schaefer et al (2021), who emphasise the importance of institutional frameworks for UDL. The present study extends this argument by demonstrating that leadership operates between two levels: it mediates the relationship between system-level conditions and classroom practice but cannot independently overcome system-wide resource limitations (Tobin & Behling, 2021).

Proposed Florence UDL Implementation Model

When the themes are considered together, they reveal that UDL implementation is not a collection of independent problems. Rather, the themes form an interconnected implementation process. Conceptual understanding influences lesson planning; lesson planning influences classroom enactment; classroom enactment is conditioned by resources and time; institutional leadership influences access to those resources and opportunities for professional learning; and professional development strengthens teachers' ability to convert experiential practice into systematic UDL design. This relationship can be represented conceptually as:

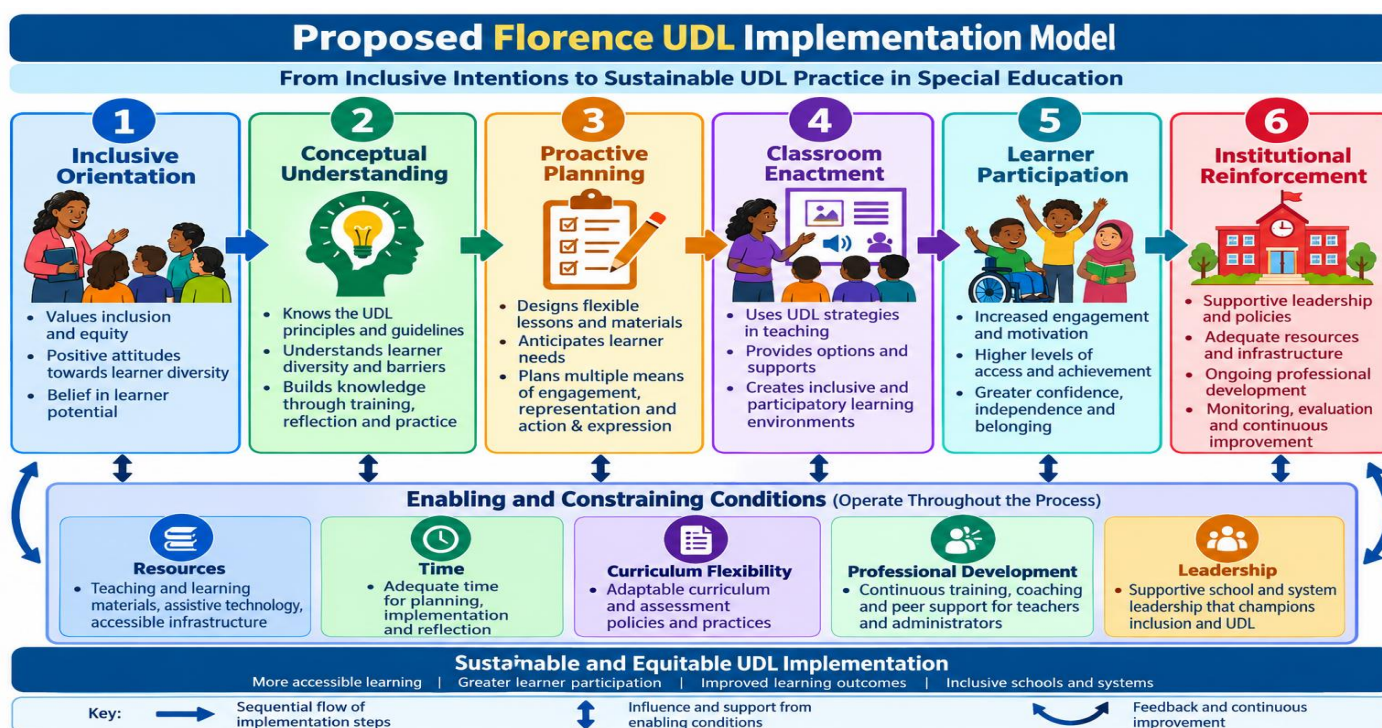


Figure 1. Proposed Florence UDL Implementation Model

The Proposed Florence UDL Implementation Model conceptualises UDL implementation as a progression from teachers' inclusive beliefs and orientations to sustainable institutionalised practice. The **Florence UDL Implementation Model** is named to signify the researcher's original conceptual contribution to understanding how Universal Design for Learning can be translated from a theoretical framework into sustainable classroom and institutional practice. "Florence" is derived from **Florence Sememba**, a teacher at Pemba Primary school, the name symbolise teaching authority the teacher command while the philosophy of the model is grounded in its central proposition of her teaching: "education should be deliberately designed to recognise learner diversity, remove avoidable barriers and create meaningful opportunities for every learner to participate and demonstrate learning". The model also recognises that implementation does not occur in isolation; it is continuously enabled or constrained by resources, time, curriculum flexibility, professional development and leadership.



Therefore, the philosophical foundation of the Florence Model is the proposition that **learner diversity is a normal and valuable feature of education and should therefore be anticipated in the design of teaching and learning rather than treated as an exception requiring remedial intervention**. From this perspective, barriers to learning are not located exclusively within individual learners; they may also arise from the ways curriculum, instruction, assessment and learning environments are designed. The model therefore places responsibility for inclusion not only on the learner to adapt to an existing system but also on teachers and institutions to design learning environments that accommodate predictable learner variability.

The model is consequently grounded in a philosophy of **proactive inclusion**. It proposes that effective inclusive education should move beyond responding to difficulties after they emerge towards anticipating potential barriers during lesson planning. This philosophical position explains the movement within the model from **inclusive orientation and conceptual understanding to proactive planning and classroom enactment**. Teachers' commitment to inclusion provides the foundation, but such commitment must be accompanied by knowledge of UDL and the capacity to translate that knowledge into deliberate instructional design.

A further philosophical principle of the model is **equity rather than uniformity**. The model recognises that treating all learners identically does not necessarily provide equal opportunities to learn. Equitable education may require multiple pathways for engagement, representation, action and expression. Consequently, flexibility in teaching and assessment is understood not as a lowering of expectations but as a means of removing unnecessary barriers while maintaining meaningful learning opportunities.

The Florence Model also embodies a philosophy of **learner agency**. Learners are positioned as active participants rather than passive recipients of teacher intervention. Opportunities for choice, participation, communication and different forms of demonstrating understanding are therefore central to the model. The intended outcome is not merely physical presence in the classroom but meaningful participation, increased confidence, independence and the capacity to exercise agency in learning.

Finally, the model is grounded in a philosophy of **shared and systemic responsibility**. The findings demonstrate that teacher commitment alone cannot guarantee successful UDL implementation. Resources, time, curriculum flexibility, professional development and leadership operate throughout the implementation process as enabling or constraining conditions. The model therefore conceptualises UDL implementation as an interaction between individual teacher capability, classroom practice and institutional conditions.

In this sense, the Florence UDL Implementation Model moves beyond viewing UDL as a collection of teaching strategies. It conceptualises UDL as a **process of pedagogical and institutional transformation** through which inclusive values are converted into intentional design, intentional design into classroom practice, classroom practice into learner participation, and learner participation into sustainable inclusive educational practice.

CONCLUSION

The study concludes that Universal Design for Learning (UDL) has a meaningful foundation in special education classrooms, with teachers demonstrating general understanding of its inclusive purpose and applying several UDL-compatible practices that support learner access, engagement, understanding and expression; however, implementation remains inconsistent and constrained by **time and curriculum pressures, inadequate professional training, insufficient teaching and learning resources and assistive technologies, rigid curriculum and assessment requirements, and limited institutional support**. The findings further indicate that effective UDL implementation requires strengthening teachers' practical competence through continuous professional development, improving access to accessible resources and assistive technology, promoting collaborative planning, providing greater curriculum and assessment flexibility, and strengthening school leadership, monitoring and accountability. Therefore, the study establishes that successful UDL implementation is not solely a teacher-level responsibility but a **systemic and institutional commitment** requiring supportive leadership, adequate resources, collaborative professional practice and sustained

investment to ensure that learner variability is effectively addressed and all learners have equitable opportunities to participate, engage and demonstrate their learning.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are proposed:

- i. **Professional Development:** Strengthen continuous, practical and context-responsive UDL professional development and integrate UDL into teacher education programmes.
- ii. **Resources and Assistive Technology:** Improve access to accessible teaching and learning materials, assistive technologies, communication supports and appropriate infrastructure, including teacher orientation and maintenance.
- iii. **Collaboration and Professional Learning:** Promote collaborative planning and professional learning communities involving teachers, specialists, therapists, parents and caregivers to address learner variability effectively.
- iv. **Curriculum and Assessment Flexibility:** Provide clear guidance for flexible curriculum delivery, accommodations and multiple ways for learners to participate and demonstrate competence within approved standards.
- v. **Leadership, Monitoring and Accountability:** Strengthen school leadership and monitoring by embedding UDL in school improvement, instructional supervision and CPD while assessing its actual application in planning, teaching, participation and assessment.

Consent for participants

Informed consent was obtained from all participants in the research.

Conflict of Interest

The authors declare no conflict of interest, financial or otherwise.

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