Original Article

Navigating Inclusion through Universal Design for Learning: Insights from a Ghanaian Special School

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ABSTRACT

This study explores the understanding and implementation of Universal Design for Learning (UDL) among teachers at Yumba Special School in Ghana, a school that serves learners with intellectual disabilities. Guided by four research questions, the study examined teachers' conceptual awareness of UDL, the barriers and enablers to its application, the perceived benefits for learners, and recommendations for improving its implementation. Using a qualitative design, data were collected through in-depth interviews with 12 participants and analysed thematically. Findings revealed that while most teachers were unfamiliar with UDL as a formal framework, they intuitively employed practices aligned with its principles, including multisensory instruction, flexible learner engagement, and varied modes of expression. However, implementation was largely reactive due to limited training, lack of planning resources, and minimal access to instructional technology. Despite these challenges, teachers reported notable improvements in learner participation, confidence, and behaviour when using UDL-aligned strategies. For instance, some reported that learners who typically remained passive became more engaged when lessons involved visual aids or practical tasks. The study highlights the potential of UDL to enhance inclusive education in low-resource special schools. It recommends stronger integration of UDL into teacher education, provision of inclusive planning tools, leadership support for inclusive pedagogy, and expanded access to teaching technology. The findings contribute to the growing discourse on contextualising inclusive education frameworks within low-resourced regions.

INTRODUCTION

Universal Design for Learning (UDL) has emerged as a transformative framework for inclusive education, particularly for learners with special educational needs (SEN). Rooted in neuroscience and educational research, UDL provides a blueprint for creating instructional goals, methods, materials, and assessments that work for all learners by offering multiple means of engagement, representation, and action and expression (Center for Applied Special Technology [CAST], 2018). This framework challenges the traditional "one-size-fits-all" approach to education by recognising learner variability as the norm rather than the exception (Novak & Rose, 2016). Globally, UDL has gained traction as an evidence-based approach to inclusion, supported by international policies such as the United Nations Convention on the Rights of Persons with Disabilities (CRPD, 2006) and the Sustainable Development Goals (SDG 4). However, while research in high-income countries has documented UDL's effectiveness in improving academic and social outcomes for diverse learners (Ok et al., 2017), its implementation in low-resource contexts, particularly in Sub-Saharan Africa, remains understudied (Nketsia et al., 2022).

The theoretical foundations of UDL draw from multiple disciplines, including cognitive neuroscience, developmental psychology, and education research. Neuroscientific evidence demonstrates that learning is distributed across three interconnected brain networks: the affective networks (the "why" of learning), recognition networks (the "what" of learning), and strategic networks (the "how" of learning) (Meyer et al., 2014). This understanding aligns with Vygotsky's (1978) sociocultural theory, which emphasises the importance of scaffolding and social interaction in learning. Furthermore, UDL builds on the principles of inclusive education by providing a practical framework for removing barriers to learning and participation (Florian & Black-Hawkins, 2011). Research has shown that when properly implemented, UDL benefits not only students with disabilities but also all learners, including those from linguistic minority backgrounds, economically disadvantaged groups, and gifted students (Rao et al., 2014).

In the Ghanaian context, inclusive education has been formally adopted through policies such as the Inclusive Education Policy (2015) and the Convention on the Rights of Persons with Disability Act (2006). These policies align with international commitments to education for all and reflect growing recognition of the rights of learners with disabilities. However, implementation challenges persist, including inadequate teacher preparation, limited resources, and deeply entrenched attitudinal barriers (Agbenyega & Deku, 2018; Opoku et al., 2021). Special schools like Yumba Special School in Tamale face particular challenges in implementing inclusive practices due to large class sizes, limited assistive technologies, and teachers who often lack training in specialised pedagogical approaches (Gyimah et al., 2021). While some studies have examined inclusive education in Ghana broadly (Agbenyega & Deku, 2018; Opoku et al., 2021), there remains a paucity of research focusing specifically on UDL implementation in special school settings.

The gap between policy and practice in Ghana's inclusive education landscape is particularly evident in three key areas. First, teacher training programs often fail to adequately prepare educators to implement inclusive pedagogies (Akyeampong et al., 2013). Many teachers graduate without exposure to UDL principles or strategies for differentiating instruction. Second, the physical infrastructure of many schools presents barriers to inclusion, with inaccessible buildings and a lack of appropriate learning materials (Adusei et al., 2023). Third, cultural beliefs about disability sometimes hinder full inclusion, with some educators holding low expectations for students with special needs (Kassah et al., 2012). These challenges are compounded in special schools that serve students with more significant support needs, where teachers often struggle with limited resources and large class sizes (Opoku et al., 2021).

Despite these challenges, emerging evidence suggests that Ghanaian teachers demonstrate remarkable resilience and creativity in adapting their practices to meet diverse learner needs (Amadu et al., 2020). Some teachers have developed innovative, low-cost solutions to implement inclusive practices, such as using local materials to create tactile learning resources or peer-assisted learning strategies (Gyimah et al., 2021). These grassroots innovations suggest that with proper support and training, UDL principles could be effectively adapted to the Ghanaian context. However, systematic research is needed to understand how teachers in special schools perceive and implement UDL, what barriers they face, and what supports would facilitate more effective implementation.

This study seeks to address these gaps by examining the implementation of UDL at Yumba Special School in Tamale, Ghana. The aforementioned school was deemed suitable for the study as it had a large population of learners with intellectual and sensory disabilities who could benefit immensely from the application of UDL principles. Thus, the school provided a rich environment to examine how UDL can support inclusive teaching practices for diverse learning needs. Focusing on teachers' perspectives and practices, the research aims to:

- Investigate how teachers at Yumba Special School understand and implement UDL principles in their classrooms.

- Identify the barriers and facilitators that influence UDL implementation in this context.

- Examine how UDL practices meet the needs of learners with special educational needs.

- Explore teachers' recommendations for improving UDL implementation in similar settings.

By addressing these questions, this study contributes to the limited body of research on UDL implementation in low-resource special education settings. The findings have important implications for teacher education, school leadership, and policy development in Ghana and similar contexts. Furthermore, the study adds to global conversations about contextualising inclusive education frameworks to diverse cultural and resource settings, moving beyond Western-centric models of inclusion to develop more nuanced, locally relevant approaches to UDL implementation.

The significance of this research extends beyond academic circles. As Ghana works towards achieving SDG 4 and fulfilling its commitments under the CRPD, understanding how to effectively implement inclusive pedagogies like UDL in resource-constrained settings becomes imperative. This study provides empirical evidence that can inform policy decisions, teacher training programs, and school-level interventions aimed at improving educational outcomes for learners with special needs. Moreover, by centring teachers' voices and experiences, the research highlights the importance of practitioner knowledge in developing contextually appropriate inclusive education strategies.

MATERIALS AND METHODS

Study Design

This study adopted a qualitative phenomenological design to explore teachers' lived experiences with implementing Universal Design for Learning (UDL) at Yumba Special School in Tamale, Ghana. Phenomenology was chosen to capture the depth and complexity of how teachers perceive and engage with UDL in a low-resource special education setting. This approach allowed for a rich exploration of teachers' understanding, application, and reflections on the barriers and enablers of inclusive pedagogy grounded in UDL principles.

Sample Size Determination and Sampling Technique

The sample size was determined using thematic saturation, whereby data collection continued until no new themes emerged. Saturation was reached after 12 in-depth interviews with teachers across various subject areas and grade levels at Yumba Special School. This ensured a well-rounded representation of perspectives and experiences.

A homogeneous purposive sampling technique was used to select participants who were full-time teachers with a minimum of two years' experience teaching learners with special educational needs. This threshold was established to ensure that participants had accumulated sufficient instructional experience and were familiar with the dynamics of special education classrooms. All participants had daily teaching responsibilities and were directly involved in planning and delivering instruction. This criterion was critical because such teachers are more likely to have encountered challenges and opportunities related to Universal Design for Learning (UDL) in real-world settings. Their practical engagement with diverse learners positioned them to provide rich, experience-based insights into UDL implementation.

Research Instrument

Data were collected through a semi-structured interview guide, designed to elicit rich, detailed responses about teachers' experiences with UDL. The guide included open-ended questions that explored participants' understanding of UDL, the extent to which they applied its principles in practice, and the specific strategies they used to engage learners with diverse needs. Additional probes addressed perceived challenges, sources of support, and teachers' recommendations for improving UDL implementation.

Questions were aligned with the three core UDL principles: multiple means of engagement, representation, and action/expression. For example, teachers were asked how they varied instruction to motivate learners, how they adapted content to meet different learning styles, and how they offered alternative ways for learners to demonstrate understanding.

Trustworthiness Criteria

To ensure rigour and trustworthiness, the study applied the criteria of credibility, dependability, confirmability, and transferability. Credibility was strengthened through member checking, which allowed participants to verify the accuracy of their transcripts, and through prolonged engagement in the school setting, which helped the researcher understand the teaching context deeply.

Dependability was supported by maintaining a detailed audit trail documenting all methodological decisions and changes throughout the research. This transparency ensured consistency and allowed others to trace how findings were derived.

Confirmability was enhanced through reflexive journaling and peer debriefing. The researcher recorded personal reflections and engaged two qualitative experts to review coding and interpretation, helping to minimise bias and ground findings in participants' perspectives.

Transferability was achieved by providing rich descriptions of the research setting, participant characteristics, and contextual factors at Yumba Special School. These details allow readers to judge the relevance of the findings to similar special education contexts.

Together, these strategies reinforced the quality and reliability of the study's insights into UDL implementation in a low-resource, special school environment.

Field Data Collection

Data collection was carried out over six weeks during the second academic term at Yumba Special School in Tamale, Ghana. Interviews were scheduled at times convenient for participants and conducted in quiet, private spaces to ensure comfort and confidentiality. Each session lasted 30 to 50 minutes and was audio-recorded with informed consent. The semi-structured format allowed for in-depth discussions on UDL implementation, with probing questions used to clarify responses.

Before formal data collection, the interview guide was pilot-tested with two teachers from a neighbouring special school. Feedback from the pilot led to minor revisions for clarity and sequencing. These revisions involved paraphrasing two interview items to improve clarity as well as rearranging three items to enhance the overall flow of the interview. During interviews, the researcher also kept a field journal to capture non-verbal cues and contextual factors relevant to data interpretation.

Data Management and Analysis

All interviews were transcribed verbatim and anonymised to protect participant identities. Identifying details were replaced with pseudonyms, and all digital files were securely stored on a password-protected external drive accessible only to the research team. Thematic analysis followed Braun and Clarke's (2006) six-phase framework. After repeated readings for familiarisation, initial coding was done inductively using NVivo, guided by UDL's core principles. Codes were grouped into potential themes, with regular team discussions to ensure coherence and reduce bias. Themes were refined, named, and defined in alignment with the study's objectives and UDL constructs. The final report synthesised these findings, using illustrative participant quotes to support each theme and reflect the authenticity of teachers' voices.

Ethical Considerations

Ethical approval for this study was granted by the Institutional Review Board of the University of Education, Winneba, before data collection. Participants were fully informed about the study's purpose, procedures, and their rights, and provided written informed consent. In handling the data, confidentiality was maintained through the use of pseudonyms, and data were securely stored with restricted access. Interviews were conducted privately to ensure comfort and candid responses, given the sensitive context of a special school environment.

FINDINGS

Demographic Characteristics of Participants

The participants involved in this current study consisted of 6 female and 6 male teachers, with ages ranging from 28 to 54 years. Their years of teaching experience varied from 3 to 25 years, reflecting a mix of early-career and veteran educators with deep institutional knowledge of special education.

Regarding academic qualifications, 4 teachers held bachelor's degrees in special education, 5 had diplomas in basic or special needs education, and 2 were pursuing master's degrees in related fields. Teachers were responsible for delivering subjects such as numeracy, literacy, vocational skills, creative arts, and life skills.

Although none of the participants reported receiving formal pre-service training in Universal Design for Learning (UDL), some had been introduced to UDL

through in-service training, peer collaboration, and informal professional development efforts. This variation in training and exposure made for a rich set of perspectives on how UDL principles are interpreted and applied special school environment.

Research Question 1: How do Teachers at Yumba Special School Understand and Implement UDL Principles in Their Classrooms?

Probe 1: What Do You Understand by Universal Design for Learning (UDL)?

Theme 1.1: UDL as an Unfamiliar Concept with Familiar Practice

"I've never heard of something called Universal Design for Learning. I think it's what some of us try to do every day without knowing the name. For example, I don't use one method. I try pictures, songs, and acting. That's how different children respond." —Teacher C

Theme 1.2: Misconceptions about UDL as Special Education

"Isn't UDL just special education teaching? We are always told to simplify things for our learners. I thought it was the same as what we do here— breaking things down and making it easier. But now I see it's more than that." —Teacher F

Theme 1.3: UDL Perceived as a Framework for Respecting Learner Differences

"When I think about it now, I realise UDL is more like a mindset—seeing every child as having potential, just in different ways. I may not use the term, but I've always believed in giving each child a fair chance to understand in their own way." — Teacher A

The responses to this probe show that although most teachers were not familiar with the formal concept of Universal Design for Learning (UDL), many were already applying aspects of it in their everyday teaching. As described in Theme 1.1, teachers

explained that they often use a variety of methods such as pictures, songs, and dramatisation to meet the diverse needs of their learners. This indicates that while the term UDL was new to them, the core ideas were not entirely foreign.

In Theme 1.2, some teachers initially misunderstood UDL as simply being another term for special education. This confusion reflects a broader challenge where inclusive frameworks like UDL are easily misinterpreted, especially in contexts where teacher training has not emphasised conceptual clarity. These views suggest that more targeted professional development is needed to help educators distinguish between UDL and traditional remedial or special education methods.

Theme 1.3 points to a positive insight. Once the principles of UDL were explained, several teachers interpreted it as a mindset of respecting and valuing the unique strengths and needs of each learner. They viewed it as a philosophy that encourages every child to succeed in their own way. This suggests that while technical knowledge of UDL may be lacking, the underlying values are already embedded in many teachers' beliefs about inclusive education.

Probe 2: How Do You Plan Lessons to Meet the Needs of Learners with Different Abilities?

Theme 2.1: Reactive Adaptation Rather than Proactive Design

"To be honest, I don't plan with a strategy like UDL. I go to class and adjust when something doesn't work. If one child doesn't get it, I try again differently. But that means I'm always reacting. I think planning with their differences in mind would help more." —Teacher A

Theme 2.2: Dependence on Routine and Familiar Strategies

"I've been using the same flashcards and activities for many years. They work for most of the children. Changing too much feels risky because some

learners don't respond well to new things. But I know I should try more methods." —Teacher G

Theme 2.3: Desire for Structured Inclusive Lesson Templates

"Sometimes I just wish we had a guide that showed us how to plan for these learners. A template or something that shows how to vary the activities and assessments. We are mostly on our own when it comes to planning for inclusion." —Teacher J.

The themes that emerged from this probe reflect the practical challenges teachers face when planning for learner diversity in their classrooms. In Theme 2.1, teachers described a largely reactive approach to lesson delivery. Rather than planning proactively with learner differences in mind, most adjustments are made on the spot when an activity fails to reach all students. This approach reflects both the flexibility and limitations of teachers who work in resource-constrained environments and often without formal training in UDL.

Theme 2.2 reveals a heavy reliance on familiar, routine strategies, which many teachers perceive as safer and more manageable in classrooms where learners have varying cognitive abilities. Although these practices offer some stability, they may also limit opportunities for innovation and personalised learning. Teachers acknowledged that while these methods work for some learners, they may not address the full range of needs in the classroom.

In Theme 2.3, teachers expressed a strong desire for structured, context-appropriate planning tools that align with inclusive pedagogical approaches. The call for lesson templates and guidance suggests that many teachers are open to adopting UDL, but they need practical support and direction. Without this, efforts to plan inclusively often remain informal and inconsistent.

Probe 3: What Methods Do You Use to Engage All Learners?

Theme 3.1: Use of Visual and Tactile Aids as Default Strategy

"Most of my children don't understand when I just talk. So I draw, I use sticks, bottle caps, or even stones. I also let them come to the board or touch things. It helps them focus and understand. Without those aids, the lesson is just noise for them." —Teacher D

Theme 3.2: Storytelling and Songs to Maintain Attention

"Songs and stories are my secret weapons. When the lesson is getting boring, I throw in a song related to the topic. It gets their attention immediately. They learn through rhythm, and they often remember better that way." —Teacher B

The findings show that teachers use a variety of creative, multisensory methods to engage learners with intellectual disabilities. In Theme 3.1, most teachers reported using visual and tactile aids as their main strategy. Objects like bottle caps, stones, and drawings serve as tools to simplify abstract content and make learning more concrete. These materials not only support comprehension but also help learners stay focused. This approach aligns with UDL's emphasis on providing multiple means of representation, even though teachers do not always name it as such.

Theme 3.2 highlights the use of storytelling and songs as techniques to capture and sustain attention. Teachers explained that learners responded positively to rhythm, music, and familiar narratives. These strategies also served as memory aids, helping learners retain information. The use of culturally relevant and engaging content demonstrates how teachers draw from local knowledge and learner interests to adapt their instruction. Although these methods are often improvised, they reflect a deep understanding of

what motivates and supports students in this context.

Probe 4: Can You Describe Any Specific UDL Strategies You Apply in Your Teaching?

Theme 4.1: Multiple Modes of Instruction Enhance Learning

"I don't rely on talking. I show them with drawings, sometimes I act it out, and other times I let them act it out. Then I let them try it themselves. I feel like they learn best when they can see, hear, and do it at the same time." —Teacher I

Theme 4.2: Flexibility in Learner Expression

"Not all my learners can speak well or write. So I allow them to point to pictures or arrange objects to show they've understood. I even let them draw answers. What matters is that they show understanding, not how they show it." —Teacher E

Theme 4.3: Limited Use of Technology in Instruction

"We don't have projectors or even working computers. I would love to use videos or pictures from the internet to teach, but we can't. Everything I do is manual. Technology would really help us implement UDL better." —Teacher K

Teachers described a range of strategies that reflect the principles of UDL in practice, even in the absence of formal training. In Theme 4.1, they emphasised the importance of using multiple modes of instruction to enhance learning. This included drawing, acting, and hands-on activities that allowed learners to engage with content through visual, auditory, and kinesthetic means. These varied approaches support learners who process information differently and ensure that no single method dominates the classroom experience.

Theme 4.2 illustrates teachers' use of flexible modes of learner expression. Rather than relying solely on writing or verbal responses, teachers encouraged learners to demonstrate understanding

in ways that suited their abilities—such as pointing, arranging physical objects, or drawing. This flexibility enabled learners with intellectual disabilities to participate more fully and confidently, reducing barriers to assessment and increasing their sense of inclusion.

However, Theme 4.3 points to a significant limitation in the implementation of UDL—the lack of access to digital tools and instructional technology. Teachers expressed frustration over the absence of basic equipment like projectors or functioning computers. While their creativity allows them to deliver lessons without technology, they acknowledged that digital resources could significantly expand their ability to implement UDL, particularly for visual learners or those who benefit from multimedia content.

Research Question 2: What Are the Barriers and Facilitators that Influence UDL Implementation in This Context?

Probe 1: What Challenges Do You Face When Trying To Teach All Learners Effectively?

Theme 1.1: Overwhelming Class Sizes Limit Personalisation

"Sometimes I have over 20 learners in one class, all needing something different. It's hard to give attention to everyone. You try your best, but it's like putting a cup under a waterfall—only so much can be done at once." —Teacher B

Theme 1.2: Curriculum Pressure Limits Adaptation

"The syllabus is tight. Even when you want to slow down and make sure all learners understand, the pressure to finish the topics makes you move on. That's not UDL; it's survival." —Teacher D

The findings highlight how systemic constraints hinder the implementation of inclusive practices like UDL. In Theme 1.1, teachers identified large class sizes as a major barrier to personalised instruction. Managing over 20 learners with varying

intellectual abilities in a single classroom made it difficult to tailor activities or provide one-on-one support. The analogy of "a cup under a waterfall" captures the feeling of being overwhelmed, where efforts to differentiate instruction are constrained by sheer numbers and limited time.

Theme 1.2 underscores the pressure teachers face to complete the curriculum, even when learners are struggling to keep up. Teachers reported that the demand to meet syllabus deadlines often forces them to prioritise content coverage over deep understanding or inclusive pacing. This results in missed opportunities for adjusting instruction to suit individual learning needs. Together, these themes show that structural challenges—rather than lack of willingness—are key obstacles to effective UDL implementation in this context.

Probe 2: What Resources Are Available to Support Your Work?

Theme 2.1: Creativity in the Face of Scarcity

"We have nothing. No flashcards, no counting blocks. So we use what we find—stones, bottle tops, sticks. It's not ideal, but it works to some extent." —Teacher E

Theme 2.2: Absence of Technology

"Other schools have computers and projectors. We don't even have enough chalk. Imagine trying to implement something like UDL with no digital support at all." —Teacher G

The findings reveal that teachers at Yumba Special School work under severe material and technological constraints, yet still demonstrate creativity and resilience. In Theme 2.1, teachers shared that they often rely on locally sourced, makeshift materials like bottle tops, stones, and sticks to support instruction. While these improvised tools serve as practical solutions in the face of scarcity, they also highlight the limited institutional support for inclusive education. Teachers are left to bridge resource gaps on their own, often at the expense of time and instructional quality.

Theme 2.2 focuses on the absence of digital infrastructure, which teachers saw as a major limitation in their efforts to implement UDL. Without basic tools like projectors or computers, teachers cannot easily incorporate multimedia resources, differentiated content, or assistive technologies. This technological gap undermines efforts to offer multiple means of representation and engagement, two core principles of UDL. Together, the themes point to a clear message: without investment in basic and digital resources, inclusive pedagogical frameworks like UDL will remain out of reach for many teachers, regardless of their creativity or commitment.

Research Question 3: How Do UDL Practices Meet the Needs of Learners with Special Educational Needs?

Probe 1: How Do Learners Respond to the Different Teaching Methods You Use?

Theme 1.1: Greater Enthusiasm with Visual and Kinesthetic Approaches

"When I use objects, drawings, or songs, the children come alive. You see them smile, respond, and even imitate the activity at home. It gives them something they can relate to, not just listen and forget." —Teacher K

Theme 1.2: Frustration with Text-Heavy or Verbal-Only Teaching

"Some learners get frustrated when I just use chalk and talk. They stop paying attention, and sometimes they even get agitated. They need more than just words, they need to experience the lesson." —Teacher D

The findings suggest that learners with intellectual disabilities respond more positively to multisensory and interactive teaching methods. In Theme 1.1, teachers described how the use of objects, drawings, songs, and movement led to greater enthusiasm,

engagement, and retention. These approaches helped learners connect with the content on a more personal and experiential level. Teachers observed that learners not only participated more actively but also showed signs of carrying the learning beyond the classroom, such as re-enacting activities at home.

In contrast, Theme 1.2 highlights the limitations of traditional, text-heavy or lecture-based instruction. Teachers noted that when lessons relied solely on verbal explanations or writing, many learners disengaged, became restless, or displayed signs of frustration. These responses point to a mismatch between instructional methods and learner needs. The contrast between these two themes reinforces the importance of differentiated, sensory-rich teaching, particularly in special education settings where learners often struggle with abstract and language-dominant content.

Probe 2: Are There Specific UDL Strategies that You've Found Particularly Effective?

Theme 2.1: Repetition and Scaffolding Increase Comprehension

"I break lessons into small steps and repeat them several times. I also let learners practice it before moving on. It might take time, but it works. That kind of scaffolding makes a difference for them." —Teacher L

Theme 2.2: Giving Learners Options Improves Performance

"I let them choose—some draw, some point, some even build their answers with materials. It gives them a chance to show what they know in a way that suits them. I get better results that way." —Teacher E

The findings from this probe highlight how teachers apply practical, learner-centred techniques that align well with UDL principles. In Theme 2.1, teachers emphasised the effectiveness of repetition and scaffolding, particularly when working with learners who require extra time to grasp new concepts. Breaking lessons into manageable steps and repeating content allowed learners to build understanding incrementally.

Theme 2.2 focuses on providing multiple options for learner expression, which helps improve performance and confidence. Teachers noted that when learners were allowed to choose how to respond—whether by drawing, pointing, or using objects—they were more likely to participate and demonstrate understanding. This flexibility honoured individual strengths and preferences, reducing stress and enhancing engagement. Together, these themes illustrate how simple, adaptable strategies can have a meaningful impact in low-resource environments.

Probe 3: What Improvements Have You Seen in Learners' Participation or Achievement?

Theme 3.1: Small Academic Gains, Significant Confidence Boosts

"When a child who couldn't recognise numbers starts pointing them out correctly, the joy on their face is priceless. They become more active, and they raise their hands more often. That confidence spills into everything else." —Teacher F

Theme 3.2: UDL Reduces Classroom Disruptions

"Once I started using more visuals and songs, I noticed fewer disruptions. Learners are more settled and focused. It's not perfect, but it helps me manage the class better." —Teacher B

Theme 3.3: Increased Willingness to Participate across Learning Tasks

"I've seen learners who used to avoid coming to the front now volunteering to show their answers or help others. It's like the methods give them courage to try, even if they're not sure they'll get it right." —Teacher K

The findings suggest that implementing UDL-aligned strategies leads to meaningful changes in learners' confidence, behaviour, and participation. In Theme 3.1, teachers described how even small academic progress, such as recognising numbers or identifying objects, resulted in significant emotional growth. Learners who achieved these milestones became more active and eager to participate, showing that academic and emotional development are closely linked in inclusive classrooms.

Theme 3.2 highlights the role of UDL in promoting classroom stability and reducing behavioural challenges. Teachers observed that when instruction was engaging and varied, learners were calmer, more focused, and less likely to disrupt lessons. This improvement in classroom climate allowed teachers to teach more effectively and helped learners feel more at ease.

Theme 3.3 expands on this by showing that UDL strategies contributed to a greater willingness among learners to participate in different types of classroom tasks. Teachers noted that previously reluctant learners began volunteering, answering questions, or supporting peers. This shift reflects not just improved engagement but also greater self-confidence and a sense of belonging. Collectively, the themes affirm that UDL can enhance not only academic access but also learner motivation and agency.

Research Question 4: What are Teachers' Recommendations for Improving UDL Implementation in Similar Settings?

Probe 1: How Can Training or Workshops on UDL be Improved?

Theme 1.1: Practical Demonstrations over Lectures

"Let the training happen in our classrooms. Let's see a facilitator model how to teach our learners. That's better than just sitting in a room and listening." — Teacher G

Theme 1.2: Inclusion of UDL in Pre-Service Curricula

"UDL should be part of teacher training from the beginning. Many of us came out of college not knowing any of this. If it were part of the curriculum, it would be normal for us by now." — Teacher J.

The themes revealed that teachers emphasised the need for more practical, hands-on training by advocating for in-class demonstrations where facilitators model effective teaching strategies, rather than relying on lecture-based workshops. They also stressed the importance of integrating Universal Design for Learning (UDL) into pre-service teacher education, noting that early exposure would make inclusive practices a natural part of their teaching approach.

Probe 2: What Role Should School Leadership or Policy Play?

Theme 2.1: Administrators must Prioritise Inclusive Teaching

"School leaders need to see inclusive teaching as just as important as exams or attendance. If they take it seriously, we'll have more room to try UDL." —Teacher B

Theme 2.2: Integration of Inclusive Practices into Supervision

"When supervisors come, they should ask how I'm reaching all learners, not just whether I followed the lesson plan. That would encourage us to try more inclusive strategies." —Teacher A

The findings underscore the critical role that school leadership and policy can play in enabling or limiting the implementation of UDL. In Theme 2.1, teachers expressed a need for school administrators to actively prioritise inclusive teaching, placing it on par with other academic metrics such as test scores or attendance. Without visible leadership support, teachers feel their efforts to diversify instruction are undervalued and unsupported.

Theme 2.2 calls for a shift in how supervision is conducted. Teachers suggested that supervision should go beyond checking lesson notes or syllabus coverage and instead include evaluation of inclusive strategies used to engage all learners. When supervisors ask targeted questions about how teachers are reaching diverse learners, it signals that inclusive pedagogy is both expected and valued.

DISCUSSION

This study sets out to explore how teachers at Yumba Special School understand and implement UDL as well as how these practices support inclusive education in a low-resource, special school setting. The findings reveal both promising practices and significant structural challenges. It offers insights that echo and expand upon existing literature on inclusive education and UDL.

It is noteworthy that although most teachers had not encountered UDL as a formal concept, many already employed strategies aligned with its principles, such as the use of multisensory instruction, flexible assessment formats, and varied engagement techniques. This supports previous findings by Amadu et al. (2020) and Gyimah et al. (2021), who highlight Ghanaian teachers' capacity to adapt creatively in under-resourced settings. It also affirms the Centre for Applied Special Technology (CAST, 2018) assertion that UDL is not about using high-tech solutions but about designing for variability, an approach that teachers at Yumba unconsciously embrace. However, as Novak and Rose (2016) emphasised that without an understanding of the underlying framework, these practices risk being inconsistent or unsustainable. Therefore, formal professional development in UDL could amplify existing practices and bring greater coherence and intentionality to inclusive pedagogy.

The study also found that teachers largely adopted a reactive rather than proactive approach to instructional design. Instead of planning with learner diversity in mind, adaptations were often made on-the-fly in response to difficulties that emerged during lessons. This finding reflects Akyeampong et al.'s (2013) critique of Ghana's teacher education system, which continues to graduate teachers with limited preparation in inclusive methodologies. The desire expressed by participants for structured lesson templates and planning support highlights the need for pre-service and in-service training to embed inclusive frameworks like UDL more deliberately into professional learning.

Another important finding concerns the methods used by teachers to engage learners with intellectual disabilities. The use of storytelling, songs, visual aids, and hands-on materials reflects UDL's emphasis on multiple means of representation and engagement. These strategies not only facilitated understanding but also sparked enthusiasm and improved classroom behaviour, as noted in both the current study and prior work by Pyle and Danniels (2017) & Fleer (2021). Yet, the findings also revealed a striking absence of digital tools, which limited teachers' ability to offer truly differentiated and multimodal learning experiences. This resonates with Nketsia et al. (2022), who observed that the lack of assistive technology remains a major constraint in Ghana's inclusive education landscape.

Despite resource challenges, the study highlights the positive impact of UDL-aligned strategies on learner outcomes. Teachers reported improvements in learner participation, confidence, and behaviour. These outcomes are central to the goals of inclusive education as articulated in the Ghana Inclusive Education Policy (Ministry of Education, 2015) and international frameworks such as the CRPD (2006) and SDG 4 (United Nations, 2015). These observations are consistent with findings by Rao et al. (2014), who noted that UDL benefits not only students with disabilities but also the broader classroom community by promoting equity and engagement.

Importantly, the study reveals that implementation of inclusive practices is often hindered by systemic constraints such as large class sizes, curriculum rigidity, and a lack of leadership focus on inclusive pedagogy. These findings mirror those of Opoku et al. (2021) and Adusei et al. (2023), who identified similar barriers in Ghanaian schools. The call from teachers for school leaders to prioritise inclusive teaching and to evaluate instructional practices through an inclusive lens underscores the need for institutional support. As Engelbrecht et al. (2020) argue, inclusive education cannot be sustained through individual effort alone; it must be structurally embedded through supportive leadership and responsive policies.

This study also reinforces Vygotsky's (1978) sociocultural theory of learning, particularly the importance of scaffolding and social interaction in supporting learner development. Teachers' use of repetition, modelling, and peer learning activities reflects an intuitive application of these principles, even in the absence of explicit theoretical framing. Furthermore, the emphasis on respecting learner differences and encouraging alternative modes of expression resonates with the inclusive education ethos described by Florian and Black-Hawkins (2011), which sees diversity as an asset rather than a problem to be fixed.

CONCLUSION AND RECOMMENDATIONS

This study investigated how teachers at Yumba Special School understand and implement Universal Design for Learning (UDL), the barriers and facilitators that influence their practices, the effectiveness of UDL strategies in meeting learner needs, and teachers' suggestions for improving UDL implementation. The findings reveal that while UDL remains unfamiliar as a formal concept, many teachers intuitively use strategies that reflect its principles, such as multisensory instruction, learner choice, and simplified scaffolding. These efforts contribute meaningfully to inclusive education, even within a highly resource-constrained environment.

However, implementation remains largely reactive, with teachers relying on routine methods or on-the-spot adjustments rather than structured, proactive lesson design. The absence of digital resources, limited pre-service training in inclusive pedagogy, and weak institutional support further undermine the sustained application of UDL. Despite these challenges, learners benefited significantly from UDL-aligned practices, showing gains in engagement, confidence, and classroom behaviour. These findings underscore the urgent need to embed inclusive pedagogies like UDL more deeply into Ghana's education system.

The findings show that teachers lacked formal knowledge of UDL and planned lessons reactively. Teacher education institutions should integrate UDL into their curriculum to ensure future educators can design inclusive lessons proactively. In-service training should reinforce this by offering practical, school-based workshops focused on lesson planning, learner variability, and differentiated instruction. Such efforts will equip teachers not only to understand UDL but to apply it consistently in diverse classrooms.

Teachers expressed a desire for practical guides and inclusive lesson templates to better structure their planning. The Ghana Education Service, in collaboration with curriculum developers, should co-create and distribute user-friendly planning tools that model UDL-aligned instruction. These resources should include examples relevant to the special education context and encourage the use of local, low-cost materials where technology is limited.

The study revealed that teachers felt unsupported by school leadership in their efforts to teach inclusively. Head teachers and circuit supervisors should be trained to recognise and promote inclusive practices during supervision. Monitoring and appraisal systems should include indicators that assess how well teachers respond to learner diversity, not just syllabus completion or classroom control. Institutionalising inclusive supervision will

signal that inclusive teaching is a shared responsibility, not an individual choice.

Despite using creative alternatives, teachers struggled with the absence of technology to deliver visual and interactive content. The Ministry of Education and its partners should invest in equipping special schools with basic digital tools, such as tablets, projectors, and multimedia content. These tools would enhance teachers' ability to represent information in multiple ways and allow learners to engage and express themselves more meaningfully, particularly those who face challenges with conventional modes of instruction.

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