



# THE PRINCIPLES OF UNIVERSAL DESIGN FOR LEARNING IN ACTION, IN PRIMARY SCHOOL CLASSROOMS

In recent years there has been a shift in mindset away from integration, to one where it is now recognised that to ensure a fully inclusive education system, the environment needs to change, not the child. Universal Design for Learning (UDL) aims to eliminate barriers and ensure that education is accessible for all learners. There is limited research into UDL in action, within Irish primary schools. This article explores the experiences of primary school teachers from three different settings. Teachers designed their lessons and environment through a UDL lens, reflecting on their practice and identifying potential benefits or challenges that were encountered. Overall, this study revealed that the benefits experienced far outweigh any challenges experienced.

**Keywords:** Universal Design for Learning, primary, inclusion, planning, learner variability.

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## INTRODUCTION

Inclusive education has been at the core of much legislation over the years in Ireland and globally (Kenny, et al, 2020). By ratifying the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), Ireland has committed to an inclusive education at all levels (Murphy et al, 2023). Furthermore, the United Nations Sustainable Development Goal 4, aims to ensure inclusive, quality, equitable opportunities for lifelong learning for all learners by the year 2030 (United Nations, 2015). However, inclusion is still often considered through a special education framework, with a focus on differentiation (Flood & Banks, 2021) (Bray et al., 2023; Flood & Banks, 2021). Furthermore, the availability of resources to support inclusion has, in the past, been influenced by economic factors (Kelly & Devitt, 2014). That said, progress has been made with the development of the New Primary Curriculum, which emphasises the importance of inclusive practices, that support the needs of all learners (Department of Education and Youth, 2025, Department of Education, 2023).

Inclusive education means supporting all learners by creating an education system that serves the needs of all (Hardy & Woodcock, 2015, Mitchell, 2005). It is closely aligned with social justice (Frumos, 2018). Chardin & Novak (2020, p32) emphasise the importance of supporting the belief that "all learners with no exceptions, can and will succeed". Over the years, there has been a movement away from integration and the expectation for learners to 'fit in' (Meegan & McPhail, 2006), to a more inclusive education system which recognises that the environment needs to change, not the learner (Thomas & Loxley, 2001). Ainscow (1999) states that inclusion is about educators making changes to their methods, materials and procedures, to embrace the needs of all learners. Schools should be responsive to every learner (Mitchell, 2005) and how people learn is unique to everyone (Khurana & Dalton, 2020). In fact, studies have shown that how people learn is as unique as their fingerprints (Meyer et al 2012, Salman & Giora, 2024).

## UNIVERSAL DESIGN FOR LEARNING

Universal Design for Learning (UDL) is a framework that aims to improve the educational experience for all learners by providing flexible methods of teaching and assessment, at all educational levels (Curneen, 2024, McGuire et al, 2006). UDL is based on three principles: designing multiple means of engagement, designing multiple means of representation and designing multiple means of action & expression (CAST, 2024). Guidelines and considerations are provided for each principle which emphasise the importance of offering a variety of opportunities for learners to engage, present content and express their learning. The goal of UDL is to promote learner agency (CAST, 2024) and promotes the variability of "numerous options and choices for students" (Chardin & Novak, 2020 p13). It aims to

eliminate barriers and recognises that barriers are in the environment, not the learner (Chardin & Novak, 2020, Reale et al, 2022).

UDL aims to improve the educational experience of all students and address the disconnect between the diversity of learners and the one size fits all narrative (Capp, 2017). Khurana & Dalton (2020) state that, by designing lessons and activities with learner variability in mind, it naturally addresses barriers to education. UDL can make the curriculum accessible to a wide range of learners and educators who have used UDL in their classrooms have reported a significant improvement in behaviour and academic results (Meo, 2008, Posey & Novak, 2020). However, its effectiveness depends on how teachers use it and to ensure a truly inclusive learner experience, teachers should be supported through appropriate professional development, that promotes a move away from reactive differentiation and towards a proactive approach to planning (Flood & Banks, 2021, Reynor, 2020). Reynor (2020), also found that the implementation of UDL in the classroom can be aided by more training for teachers. Despite this, Flood & Banks (2021) found that exposure to UDL as part of initial teacher training was still limited. This exacerbates a challenge found by Edyburn (2020, p36) that teachers are “left to their own devices” on how to implement the principles of UDL in their classrooms. Nonetheless, some progress is occurring, and UDL modules are now more evident in colleges across Ireland (The Teaching Council, 2024). Furthermore, the Céim Standards for Initial Teacher Education, provide UDL as an example of an effective framework for ensuring inclusive education (Céim, 2020). However, research has found that student teachers faced a lack of support from qualified teachers on implementing UDL, due to their limited knowledge on the subject (Reynor, 2020).

## **NEW CURRICULA**

By promoting equity of opportunity, the principles of UDL present a new view for curriculum development, that aid the challenges faced by educators in catering for an increasingly diverse population (Meyer et al. 2014). The principles of UDL are becoming increasingly prevalent throughout Irish curriculum related publications, such as the reformed Junior Cycle (Kelly, 2009). The reformed Junior Cycle aims to be engaging and responsive to students’ needs, and inclusion is one of its core principles. It aims to make learning more engaging, exciting and inclusive, and focuses on formative assessment and the learning process (Kelly, 2009). These inclusive education programmes are now being extended to Senior Cycle (NCSE, 2024).

The National Council for Special Education’s (NCSE) Policy Advice Paper for Special Schools and Classes, also puts UDL forward as a best practice approach to inclusion and recommends that UDL is embedded in practices across the education sector (NCSE, 2024). It puts UDL forward as an approach used to improve teaching and learning by offering flexibility and choice, removing barriers to learning and recognising learner variability. The NCCA (2016) highlighted the prevalence of bookwork for teaching mathematics and called into question their usefulness. It highlighted the need for the presence of multiple means of engagement such as group work, concrete materials and maths talk. Moving forward, the new Primary Maths Curriculum (PMC) was developed in line with the principles of UDL (NCCA, 2016) and promotes the principles of equity and access for all children (DE, 2023). Furthermore, the new Primary Curriculum recognises that “each child’s journey is different and provides flexibility and choice” (NCCA, 2023, p3) and again referred to the principles of UDL throughout its development (NCCA, 2022). It promotes agency in engagement and participation and responds to the uniqueness of every learner, recognising that learner experiences should be responsive to the diverse needs and abilities of all (DE, 2023).

## **METHODOLOGY**

This research investigated the impact of UDL based lesson design on the teaching and learning environment within primary school classrooms, resulting in the following research question: Can designing lessons through a UDL lens impact upon the teaching and learning experiences in primary school classrooms?

A qualitative approach was used in the form of action research, which was selected because the goal of the action researcher was to be reflexive about teaching in practice and foster development, enabling educators to understand their practice better and use their findings to enhance their teaching going forward (Columbia, 2024, McAteer, 2013). This action research was a form of self-reflection and reflective practice has a positive impact on how people work (Feekery, 2023, McAteer, 2013, Schmuck, 2008, Thompson, 2021). Teachers used the principles of UDL to redesign their lessons. They reflected upon their practice before, during and after the changes were made to identify what benefits or challenges were encountered.

Once ethical approval was received for this research through Maynooth University, a purposive sampling method was used to ensure the suitability of participants. Primary school teachers were selected as participants because their

role positioned them with access and opportunity to design, implement and evaluate their practice. An outline of the study was distributed to primary school principals requesting permission to invite teachers to participate in the study. Once permission was obtained from principals, an invitation to participate was extended to teachers. Thirteen from three primary schools accepted the invitation, a large, mixed, suburban school, with 600 pupils; an inner-city DEIS band 1 school, with 353 pupils; and a mixed rural national school, with 162 pupils. Teachers included:

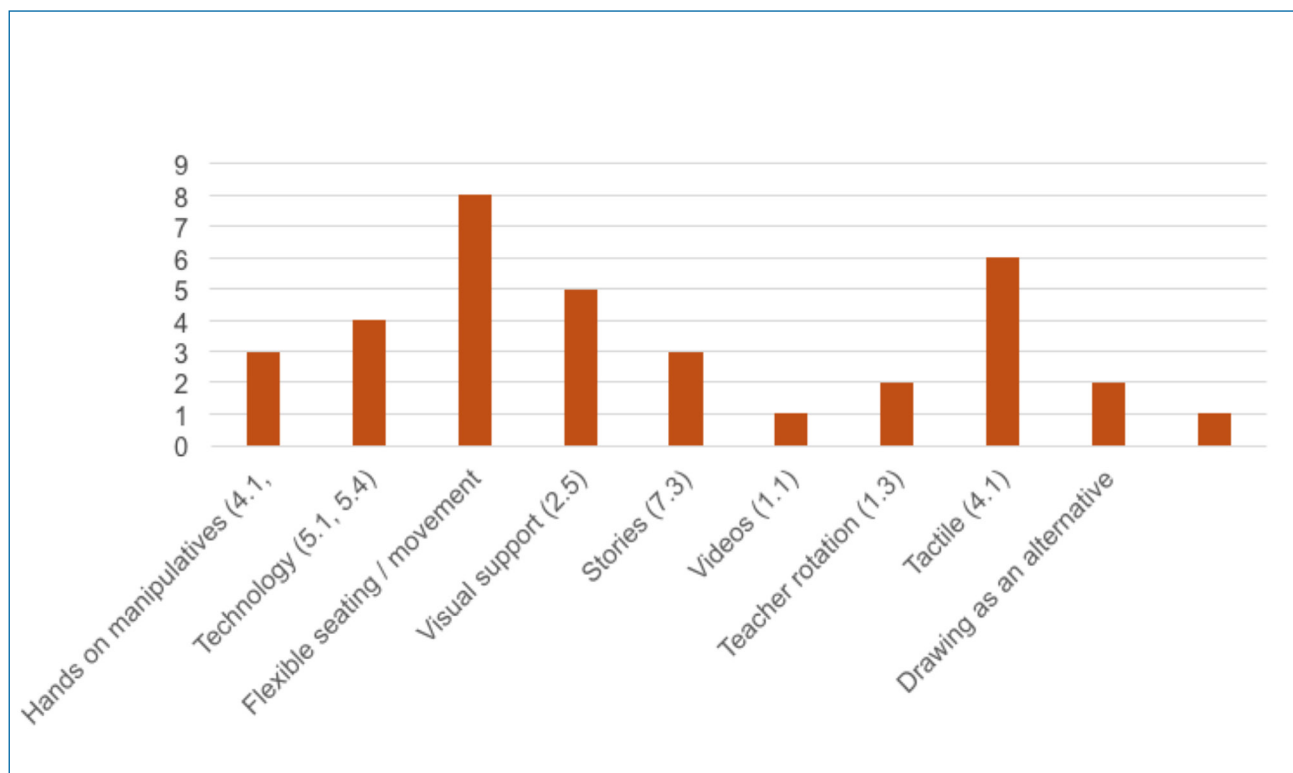
- three Infant class teachers,
- six teachers teaching 1st and 2nd class,
- four Special Education Teachers (SETs) working with children from Junior Infants to 6th.

Teachers were informed that their participation was voluntary and that they could withdraw from the study at any time. They were assured that details would remain confidential through the use of pseudonyms, and that all documents would be stored in compliance with data protection legislation, and GDPR, using the researcher's professional, password-protected, encrypted laptop. Participants attended a meeting with the researcher and an overview of inclusion, UDL and its goal, aims and principles were presented. Questioning established that participants' knowledge of UDL was limited, with only two participants being aware of the framework incidentally through other CPD. This is reflective of a study carried out by Capp (2017) which found that mainstream teachers did not have a comprehensive understanding of UDL, thus, hindering their capacity to implement it in their classrooms. Examples of UDL in action were provided during the meeting and an outline of the study and what participants could expect, were discussed. A screencast reaffirming what was discussed at the initial meeting was shared with participants, as a tool to refer to throughout the process. Participants were also provided with an anticipatory reflective form with questions to guide their implementation of UDL. They were also provided with a reflection form to record their experiences and feedback on the outcomes of their lesson change.

The researcher collaborated with the participants, offering support and guidance and addressing any concerns participants had while ensuring thrust and transparency throughout the process, that ran from January to April 2025. Participants were provided with questions to guide their reflective and feedback process. Teachers were asked what barriers if any they experienced and were the learning outcomes met. Once the data were collected and analysed, it was transferred to spreadsheets to identify patterns and determine results.

## RESULTS

**Figure 1** gives a breakdown of the findings by identifying the different approaches used by participants. Some means were more frequently implemented than others and the number of changes implemented, varied among participants.



### **Principle: Design Multiple Means of Engagement**

Teachers offered a tactile alternative to pencil and paper, during letter formation lessons. They used sand trays, play dough, chalk boards, wool, white boards and links to introduce and practise letter formation. Teachers reported that as a result they noticed increased engagement and an improvement in writing. Tactile activities were also implemented in the form of exploration of the outdoors to explore shapes and the use of food to explore the concept of weight. A common barrier identified by teachers in relation to their lessons, was an increase in planning time. It was also noted that some children did go off task with certain materials, but overall engagement improved. Teachers also used stories to increase engagement. One teacher provided the children with two story options and the children voted on which story they would like to read during story time. This gave the children ownership over the activity and increased the level of interest among the children. One teacher provided action-oriented feedback. The children were encouraged to reflect on their work, with an option to conference with the teacher or peers to identify areas for improvement and areas of success. Teachers noticed a marked improvement in the children's ability to reflect and take ownership of the assessment process.

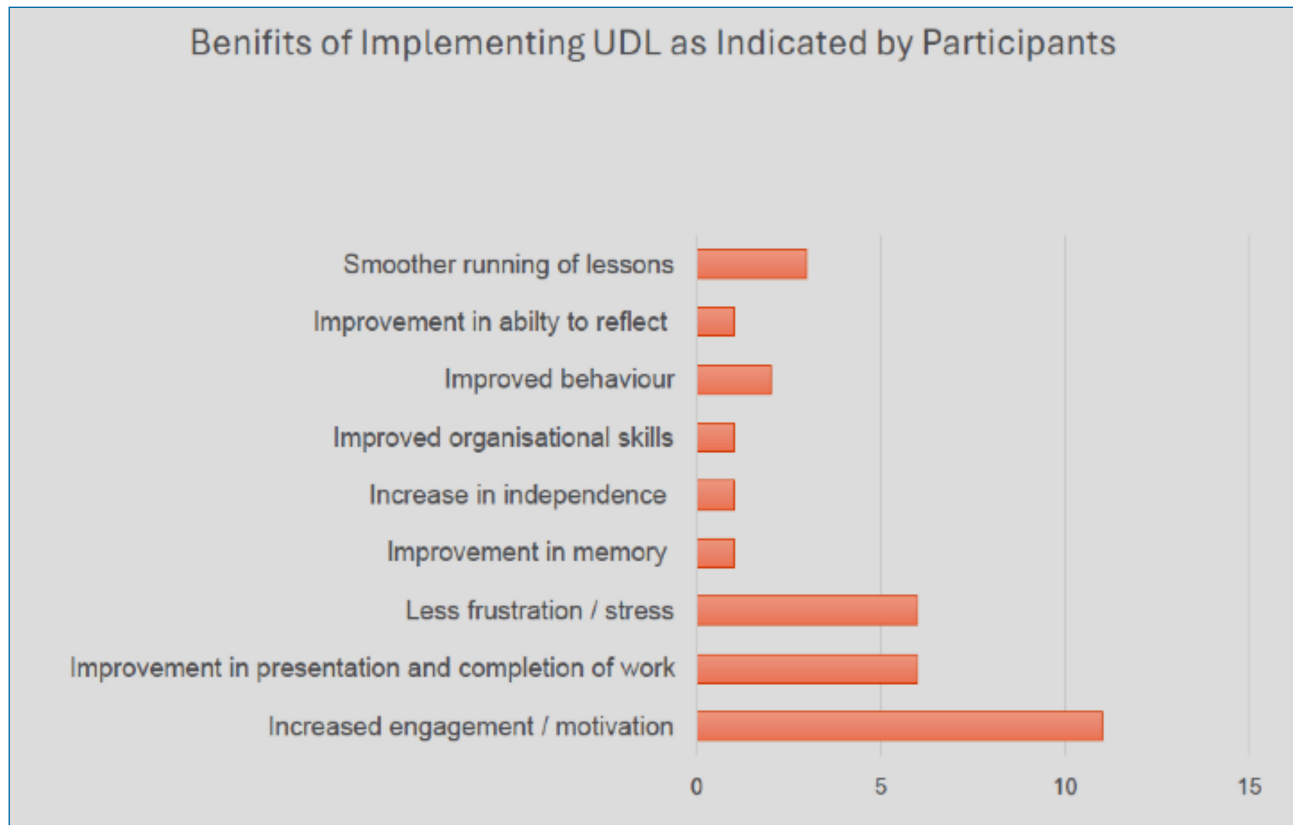
### **Principle: Design Multiple Means of Representation**

Teachers incorporated visuals to reinforce verbal instructions. Visual aids were used in addition to a word wall, to expand the children's vocabulary of adjectives. As a result, the children used a wider variety of adjectives than in previous lessons and the teacher reported that reluctant readers were able to access the vocabulary with more ease. One teacher already had a visual aid in place to support a child with SEN. However, this visual had become a distraction, was overwhelming for the child and did not give the child ownership or choice over their tasks. A simplified visual was implemented in collaboration with the child, giving them a choice of activities and sequence of events. These changes helped the child to understand expectations and improved behaviour. Online tools were used to create formation videos to support writing lessons. Videos were played on a loop during the writing portion of the lesson. This enabled the teacher to be present and physically support the children, while the children also had access to the formation in action. Teachers noted a decrease in the number of children requiring support and an improvement in letter formation skills. Visual images were used on the board to support verbal instructions. Homework books, copies and folders were displayed on the board in conjunction with the teacher explaining verbally what books were required for homework. This resulted in a decrease in books being forgotten and an increase in independence and organisational skills. Rotation of teachers during team teaching was used to expose the children to different perspectives and experience a variety of approaches. Team teaching was adapted to include the rotation of teachers at different intervals of a session, which also resulted in an extra movement break for children. Teachers found that children were more enthusiastic about team teaching, but children did become distracted wanting to know when it was time to move. As a result, a visual countdown was displayed that eliminated this distraction and helped the children to focus. Teachers noticed a significant improvement in engagement and presentation of work.

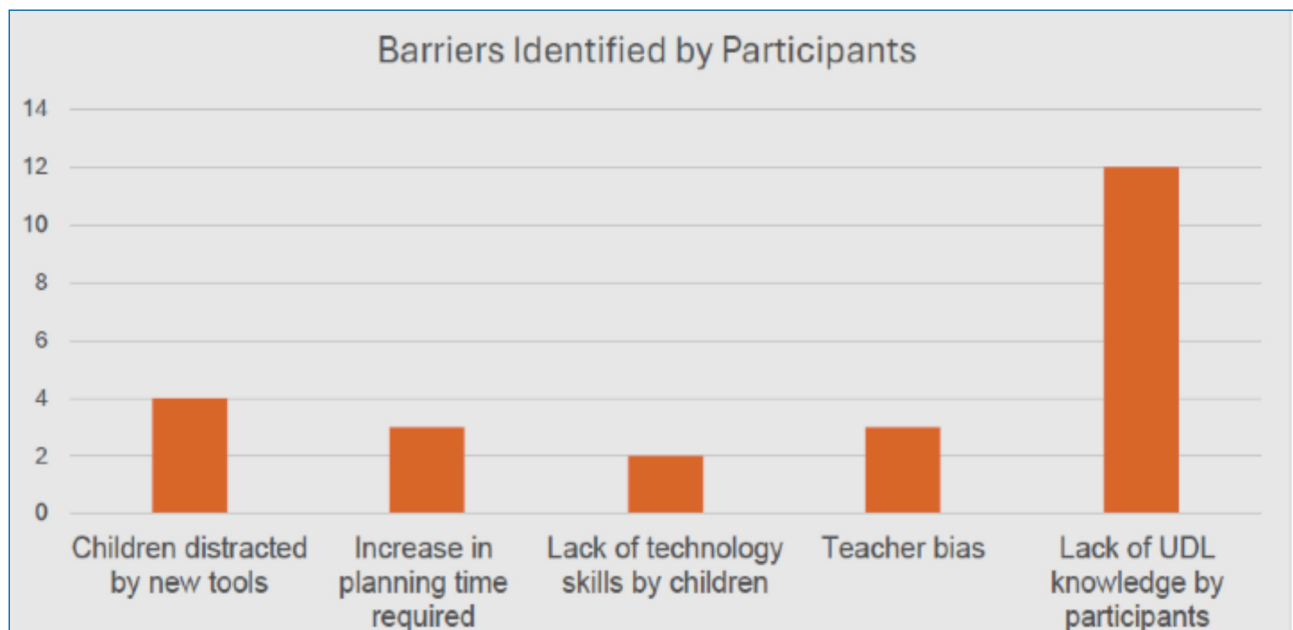
### **Principle: Design Multiple Means of Action & Expression**

The results showed that sixty percent of changes made came under the principle of action and expression. Teachers created a flexible seating environment for specific lessons. They expressed difficulty adapting to this change and had to consciously remind themselves not to correct the movements and seating positions of children. In their reflections, teachers stated that the children appeared more relaxed and that listening skills improved. Furthermore, it was noted that lessons ran more smoothly as interruptions to correct fidgeting were eliminated. One SET incorporated a peanut ball into lessons to create proprioceptive movement as an alternative to stationary work. This decreased fidgeting and increased motivation to work. One teacher created a shape walk for the children, to explore shapes through movement and tactile exploration. The multisensory aspect of the lesson supported a wide range of learners, however, an increase in planning time and availability of materials did create some challenges. Maths baskets were made available to all children in some classes. Children were made aware of their availability and could choose to access the materials at their discretion. One teacher noticed that children who would confidently complete tasks independently prior to this change, used the materials more frequently than others. Another noticed increased engagement in lessons and found it naturally challenged all children appropriately. However, both teachers noted an increase in planning time and that the materials were a distraction for some children. Children were provided with alternative options to written tasks by a teacher in second class. Children had the choice of writing, drawing, typing and dictating. The teacher noticed that not all children were comfortable with technology which did create a barrier for those children. The new tools also created a distraction for some. Despite this, children appeared less frustrated and there was an increase in the number of children completing the task. Another teacher who also introduced technology, encountered similar challenges. A large amount of time was required to pre-teach the skills required to use the new equipment and a greater proficiency in typing would have been beneficial. Nonetheless, improvements in memory and accuracy were evident over time. Alternatives to written responses were also introduced by a teacher in first class. During a maths lesson, children were given the option to draw or write their answer. For example, during a weight lesson, given the question, which is heavier, the apple or the pineapple? The children could draw a pineapple or write the word. The teacher observed a less stressful environment and heightened engagement by children who would previously be inclined to avoid written tasks.

**Figure 2** gives a breakdown of the benefits as indicated by participants. All participants gave more than one benefit that occurred because of their implementation of one or more UDL principle.



The most frequently cited benefit was an increase in engagement and motivation, observed by eleven of the thirteen participants. A decrease in frustration and stress among students was noted by six participants. A further six of the participants noted an improvement in presentation and completion of work. Smoother running of lessons, an improvement in behaviour, an increase in independence and organisational skills, improvement in the children's ability to reflect and an improvement in short term memory, were all cited by one or more participants.



Participants aimed to reduce or eliminate barriers to learning, however, new barriers were identified by participants. A barrier that was highlighted from the initial meeting with participants, was their lack of knowledge and understanding of the UDL framework, with over eighty percent of participants stating that they had no prior knowledge of UDL.

Another barrier encountered by participants was the distraction caused by new tools. Teacher bias was a barrier identified by participants who implemented a flexible seating system, experiencing difficulty restraining their impulse to correct position, posture and fidgeting motions. Participants also voiced their concerns in relation to the extra time required to plan and teach new skills.

## DISCUSSION

UDL aims to eliminate barriers (Chardin & Novak, 2020). All participants began by identifying barriers and creating changes that would eliminate these barriers to learning. However, new barriers were encountered by some participants. A common challenge identified throughout these findings was a lack of time to plan and implement changes. This is reflective of previous research findings. When identifying challenges to UDL, Alquraini & Rao (2020) state that it takes time to implement the changes. Maynooth University UDL Teaching and Learning Fellows (2024) also note that the time required to implement UDL changes can be off putting. However, Edyburn (2020) argues that the positive results that come from implementing UDL, justify the time spent introducing and designing these changes. Notwithstanding this, all teachers noticed a marked improvement in engagement or results. A lack of knowledge of the UDL framework was also a concern for participants, when initially approached to take part in the research. Reynor (2020) recognised the necessity to practice using it over time, reflect on it, and use it again with newly gained understanding. This was the reality for many participants who went on to implement additional changes, the more comfortable they became with the framework.

UDL forces educators to confront their biases (Chardin & Novak, 2020). This was the experience of participants, specifically those who created a flexible seating environment or those who allowed for more movement. While adults often believe children must stop moving to focus, researchers have discovered that the opposite is true (Pica, 2024). Children need movement to engage their brain (Hanscom, 2014). Furthermore, according to Sarver et al, (2015) when we tell children with ADHD to sit still or stop moving, they are using all their mental energy to focus on that rule, which prevents them from focusing on whatever task we want them to do. Results were reflective of this theory with teachers observing improvements in focus, engagement, classroom atmosphere and understanding.

According to Edyburn (2021), when educators design lessons with support that reduce the likelihood of failure, it will minimise learner frustration. A less stressful environment and reduced frustration among children was a result indicated by both teachers who provided the option for the children to draw their responses in place of writing. UDL promotes the variability of “numerous options and choices for students” (Chardin & Novak, 2020 p13). It aims to improve the educational experience of all students through the implementation of flexible methods of teaching and assessment (Ahead, 2024).

A significant factor throughout the results was optimising choice and autonomy for students. The findings of this research reflect previous studies in the area. The benefits of implementing the UDL framework into lessons outweigh the challenges. The main challenge reflective of previous research, is the lack of training for educators and limited awareness and knowledge of the UDL framework. While colleges have begun to integrate UDL into initial teacher training, more experienced teachers are not always aware of the UDL framework. Meaningful CPD and further research would create an awareness of UDL and develop educators’ knowledge of the framework. Time constraints were another barrier, again, evident in previous studies. However, as seen in this study, the more familiar participants became with the framework, the more confident they were at implementing changes. Again, highlighting the need to create familiarity with the UDL framework.

Although the number of participants and time frame of this study was limited the research has identified both benefits and challenges to the implementation of UDL. The findings clearly show the need for further research into UDL and a void in teacher training in the area. Overall, it encouraged the participants to offer choice, be more flexible and overcome their bias.

## LIMITATIONS

Despite there being thirteen participants involved, all class teachers were based at the junior end of primary school, with senior children only being represented through SET. This limited the findings as senior classes were not fully represented in the same capacity as the junior classes. The study was carried out over a relatively short period of fifteen weeks, and a longer period would allow for more in-depth findings into the effects of UDL on learning. As previously mentioned, the majority of participants had limited or no knowledge of UDL and were dependent on the guidance of the researcher, a limitation also evident in research by Almutairi & Alsuwayl, (2023).

## RECOMMENDATIONS

The findings of this research reflect previous studies in the area. The benefits of implementing the UDL framework into lessons outweigh the challenges (Edyburn, 2020). The first main challenge, reflective of previous research, was the lack of training for educators and limited awareness and knowledge of the UDL framework (Flood & Banks, 2021). The second challenge of time constraints is again, evident in previous studies (Edyburn, 2020). However, as seen in this study, the more familiar participants became with the framework, the more confident they were at implementing their changes. And while colleges have begun to integrate UDL into initial teacher training, explicit training on the subject is still limited, particularly for experienced teachers. Meaningful CPD and further research would create an awareness of UDL and develop educators' knowledge of the framework, thus alleviating these challenges.

Although the number of participants and time frame of this study was limited, the research has identified both benefits and challenges to the implementation of UDL. The findings clearly show the need for further research into UDL and a void in teacher training in the area. However, overall, it encouraged the participants to offer choice, be more flexible and overcome their bias.

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